Natura Impact Statement

ABWP Phase I Decommissioning

RAMBØLL Bright ideas. Sustainable change.

Project name ABWP Phase I Decommissioning

Project no. 1620011606-002

Ramboll
240 Blackfriars Road
London
SE1 8NW
United Kingdom
https://ramboll.com

Document revision history

Version	Reason for issue	Author	Date	Checked	Date	Approved	Date
1	Client First Issue	AB MD	14.05.2026	RG	21.05.2026	KB	02.06.2026
2	Client Second Issue	AB MD	26.06.2026	RG	30.06.2026	KB	16.07.2026
3	Client Third Issue	AB MD	27.07.2026	RG	27.07.2026	KB	27.07.2026
4	Client Final Issue	OS	27.08.2026	MR	27.08.2026	MR	27.08.2026

Contents

List of Tables

List of figures

Statement of Authority

Author	Qualifications	Relevant Experience
Amelia Bywater Senior Marine Ecologist	BSc (Hons) Marine Ecology MSc Marine Environmental Protection Associate Member of CIEEM	Senior marine ecologist with previous experience in MARA Maritime Usage Licence and foreshore licence applications in Irish waters. Previous experience also includes all phases of offshore wind development and the decommissioning of power stations (including nuclear). Extensive experience in assessing potential effects on marine ecology receptors across a wide range of sectors.
Melanie Downer Graduate Marine Ecologist	BSc (Hons) Ocean Sciences and Biology MSc Marine Ecosystem Management	Background in offshore consenting support, including geophysical survey licence applications and renewable energy developments. Previous experience evaluating potential effects on marine ecological receptors across diverse marine and coastal projects.
Oriol Sot Olivet	BSc Biology, University of Girona (Spain) MSc Environment, Sustainability and Sustainable Development Goals (SDGs) (Spain)	Experience in permitting and environmental impact assessment for a wide range of renewable energy projects.
Richard Gibbs Principal Marine Ecologist	BSc (hons) Marine Biology and Oceanography Member RSB	Marine ecology technical lead with over 10 years experience in marine consultancy. During this time he has worked on a range of offshore wind and interconnector projects, including undertaking DCO ES chapters for a range of receptors, including fish and shellfish and marine mammals. Has experience on EIA projects in Ireland as well as decommissioning projects for offshore wind farms and power stations (nuclear / CCGT).
Dr Jackie Hill Marine Ecology Lead	BSc (Hons) Marine Biology PhD, Marine Ecology	Marine Ecology lead with 20+ years of experience in marine ecology, environmental impact assessment, UK consenting regime and international projects. Particular expertise in benthic ecology, underwater sound impact assessments, determining survey scopes and understanding of UK regulatory requirements. Experience also includes EIA projects in Ireland and all phases of offshore wind development.

Glossary

Term	Meaning
Arklow Bank Wind Park (ABWP) Phase I	Arklow Bank Wind Park (ABWP) Phase I comprises: • Offshore infrastructure seaward of High Water Mark (HWM), including: – Seven Wind Turbine Generators (WTG) with a combined capacity of 25.2 MW; – One meteorological (met) mast; – Inter-array cables connecting the WTGs and met mast; and – One offshore export cable connecting WTG T4 with landfall at HWM; • Onshore infrastructure landward of HWM including: – One onshore cable connecting landfall at HWM with the onshore substation; and – One onshore substation compound, where the onshore substation and ancillary infrastructure are located.
ABWP Phase II	ABWP Phase II comprises: • Offshore Infrastructure, including: – 53 or 47 WTGs and two Offshore Substation Platforms (OSPs) located within the "Array Area"; – Inter-array cables connecting WTGs with the OSPs; and – Two offshore export cables; • Onshore grid connection infrastructure, including a 220 kV substation at Shelton Abbey with an associated connection to the existing National Electricity Transmission Network; • Operations and Maintenance Facility (OMF) at South Dock, Arklow Harbour; and • EirGrid Upgrade Works.
Additional mitigation	Actions that will be required to reduce the significance of environmental effects of the Proposed Works, which will be dependent on the significance of effects assessed in the EIAR. Also referred to as secondary mitigation in Institute of Environmental Management and Assessment (IEMA) (2024). IEMA is now the Institute of Sustainability and Environmental Professionals (ISEP).
Alternatives	A description of other options that have been considered during the conception of the Proposed Works (Environmental Protection Agency (EPA), 2022). Article 5(1) and Annex IV of the Environmental Impact Assessment (EIA) Directive) require "a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, including a comparison of the environmental effects" (EIA Directive 2011/92/EU (as amended)).
Arklow Energy	Arklow Energy Limited, the entity seeking planning permission for the Proposed Works, i.e. the applicant.
Appropriate Assessment (AA)	An assessment of the potential adverse effects of the Proposed Works (in combination with other plans or projects) on Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which are protected by national and European law (EPA, 2022).
AA screening	A process undertaken by the competent authority to assess, in view of best scientific knowledge, if a proposed development, individually or in combination with other plan or project is likely to have a significant effect on a European site, and whether an appropriate assessment (AA) is required or not (Section 177U(1), Planning and Development Act 2000 (as amended)).
AA screening Study Area	Area covered in the characterisation of the baseline environment and considered in the assessment of potential environmental effects as defined in Section 3.1.3 in this document.
Baseline	A description of the relevant aspects of the current state of the environment (baseline scenario) (EIA Directive 2014/52/EU).
Compensatory measures	Compensatory measures are measures required under Article 6(4) of the Habitats Directive that are designed to offset the adverse effects of a plan or project on a European site so as to ensure that the overall coherence of the

Term	Meaning
	Natura 2000 network is protected. They are distinct from mitigation measures and are only relevant where a project is permitted notwithstanding a negative appropriate assessment under the Article 6(4) derogation procedure (interpreted from the Habitats Directive (92/43/EEC)).
Competent authority	Are those authorities that are entitled to give authorisation or consent to a plan or project. In the planning system, this means planning authorities and An Coimisiún Pleanála. There are, however, a wide range of other competent authorities in respect of other consent regimes e.g. EPA (environmental licencing), Minister for Agriculture, Food and the Marine (forestry, aquaculture and foreshore management), and various state bodies that have authority to undertake development under Part 9 of the Planning and Development Regulations (e.g. An Garda Síochána, defence forces, the courts service). The competent authority for this planning application is An Coimisiún Pleanála (ACP).
Consent	This shall include any licence, permission, permit, approval or other such authorisation granted by a public authority for any activity, or project where the authority is obliged to have regard to the requirements of the Environmental Impact Assessment (EIA) and/or Habitats Directive(s) (MDB, 2017).
Conservation Objective (CO)	A specified population size and distribution objective for a species, or a specified area and quality objective for a habitat, to ensure that a site contributes as best as possible to achieving favourable conservation status at national, biogeographical or European level (Article 1(k) of the Habitats Directive (92/43/EEC)).
Decommissioning	The final closing down and putting into a state of safety of a development, project or process when it has come to the end of its useful life (EPA, 2022).
Design measures	Mitigation measures included as part of the Proposed Works. Include modifications arising through the iterative design process; and standard industry practice that would occur even without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. Correspond to primary and tertiary mitigation defined in Institute of Environmental Management and Assessment (IEMA) (now Institute of Sustainability and Environmental Professionals (ISEP)) (2024).
Designated sites	Unless otherwise specified, the term 'designated' is used to refer to international sites, European sites and national sites (that are legally designated, or are going through the process of designation (MDB, 2017).
Detailed Offshore Decommissioning Environmental Management Plan (DEMP)	The contractor-developed version of the Outline Offshore DEMP, to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Offshore Waste Management Plan (WMP)	The contractor-developed version of the Outline Offshore WMP, to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Vessel Management Plan (VMP)	The contractor-developed version of the Outline VMP, to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Dredged material	Seabed material arising from localised dredging potentially required to facilitate safe vessel access during Proposed Works Offshore, and / or extraction of seabed material located inside monopile (MP) foundations, as part of MP decommissioning.
Dumping	Any deliberate disposal in the maritime area (including side-cast dredging, plough dredging, water injection dredging and other such dredging techniques of a substance or material from or in conjunction with a vessel or aircraft or offshore installation (Dumping at Sea Act 1996 (as amended)).
Effect	The consequence of an impact on a receptor. For example, in the offshore environment, vessel activity (activity) results in increased levels of underwater noise (impact), with the potential to disturb marine mammals (effect).
Embedded mitigation	Mitigation measures included as part of the Proposed Works. Include modifications arising through the iterative design process; and standard

Term	Meaning
	industry practice that would occur even without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. Correspond to primary and tertiary mitigation defined in Institute of Environmental Management and Assessment (IEMA) (now Institute of Sustainability and Environmental Professionals (ISEP)) (2024).
Environmental Impact Assessment (EIA)	Process of assessment of the effects of a project or development proposal on the environment. In the planning area, it is undertaken by a planning authority or An Coimisiún Pleanála during the consideration of applications for planning permission, taking account of an Environmental Impact Assessment Report (EIAR). The projects which require EIA are listed in Annex I and Annex II of the EIA Directive, as amended (Office of the Planning Regulator, n.d.).
Environmental Impact Assessment Report (EIAR)	A report or statement of the effects, if any, that Proposed Works, if carried out, would have on the environment. It is prepared by the developer to inform the EIA process (Office of the Planning Regulator, n.d.).
European site	Meaning assigned to it in the EC (Birds and Natural Habitats) Regulations 2011, which is also commonly known as a Natura 2000 site (Office of the Planning Regulator, n.d.).
High Water Mark (HWM)	Level reached by the sea at high tide, measured as the mean of high tides.
Impact	A change brought about by the Proposed Works.
Imperative Reasons of Overriding Public Interest (IROPI)	Where a development is likely to have adverse effects upon the integrity of a European site, or where adverse effects cannot be ruled out, and in the absence of suitable alternative solutions, the competent authority may grant consent where a development is considered to be necessary for IROPI (Planning and Development Act 2000 (as amended)).
In-combination effects	Incremental effects resulting from a combination of two or more plans and/or projects, an assessment requirement under the Habitats Directive (92/43/EEC). In-combination effects referred to in the Habitats Directive are considered to have a similar meaning to "cumulative effects" in the Environmental Impact Assessment (EIA) Directive (2011/92/EU (as amended)).
Inter-array cables	Subsea power lines that link individual wind turbine generators (WTGs) together in an offshore wind farm, forming an electrical network. In ABWP Phase I, inter-array cables connect WTGs and the met mast to each other and have an overall length of 7.4 km.
Landfall	The point where the offshore export cable transitions from the offshore marine environment to the onshore terrestrial environment.
Lowest Astronomical Tide (LAT)	Exact, lowest theoretical sea level that can be predicted to occur under average meteorological conditions.
Meteorological (Met) mast	A mast with a number of meteorological sensors located at different heights to record meteorological and sea condition data
Meteorological (Met) mast	A mast with a number of meteorological sensors located at different heights to record meteorological and sea condition data
Monopile (MP)	Hollow steel cylinder driven into the seabed typically used to anchor an offshore wind turbine generator (WTG). In ABWP Phase I, MPs support the seven WTGs as well as the meteorological (met) mast.
Natura 2000 network	Network EU-wide network of nature conservation areas established under the 1992 Habitats Directive (and 1979 Birds Directive). The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It includes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (Office of the Planning Regulator, n.d.).
Natura Impact Statement (NIS)	A statement, for the purposes of Article 6(3) 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. This is prepared by the applicant (Office of the Planning Regulator, n.d.).
Nautical mile (nm)	Measurement used for distances at sea. 1 nm equates to 1.852 km.

Term	Meaning
Noise	The terms noise and sound are often used interchangeably. Noise usually refers to unwanted or disturbing sounds that interfere with normal hearing and can be unpleasant or harmful. It is often characterised by irregularities in the sound waves and is considered a form of sound pollution.
Non-impulsive sound	Sound that is continuous or occurs intermittently but does not exhibit the distinctive features associated with impulsive sound.
Offshore export cable	Subsea power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the offshore export cable connects the wind turbine generator (WTG) T4 to landfall with an approximate overall length of 15.6 km. At landfall, the offshore export cable transitions to the onshore cable connecting to the onshore substation.
Offshore Site	Part of the Site where Proposed Works Offshore are proposed to take place. In this application for planning permission, the Offshore Site comprises the Sub Lease Area, where the ABWP Phase I wind turbine generators (WTGs), met mast and inter-array cables are located, and the offshore export cable 10 m corridor connecting WTG T4 to the landfall at high water mark (HWM) near Arklow Harbour.
Onshore cable	Land-based portion of the power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the onshore cable connects the landfall point at HWM to the onshore substation building.
Onshore substation compound	Fenced compound that hosts the onshore substation building and ancillary facilities, including the 38 kV transformer.
Pathway	The route by which an effect is conveyed between a source and a receptor (EPA, 2022).
Planning permission	Formal, legal approval required from a local planning authority or An Coimisiún Pleanála (ACP) to carry out development. The Proposed Works require planning permission submitted from ACP under Section 291 of the Planning and Development Act 2000, as amended.
Proposed Works	The Proposed Works include decommissioning of ABWP Phase I offshore infrastructure (Proposed Works Offshore) and decommissioning of ABWP Phase I onshore infrastructure (Proposed Works Onshore).
Qualifying Interests	In Ireland, habitats and/or species which are the reason(s) for the designation of an SAC are referred to as 'Qualifying Interests' (QIs). For SPAs, bird species and their habitats which are the reason for a particular site designation are referred to as 'Special Conservation Interests' (SCIs). In this AA Screening Report, QIs and SCIs are together referred to as qualifying features.
Receptor	Any element in the environment which is subject to impacts (EPA, 2022).
Scour protection	Engineered barrier typically placed on the seabed around WTG foundations and subsea cables to prevents sediment erosion caused by accelerated water currents and waves, safeguarding the WTG's stability and protecting subsea cables. In ABWP Phase I, scour protection was originally introduced in the form of rock armour, however, this proved ineffective, and was removed in 2005. Since then, scour protection has been introduced through sandbags.
Sensitivity	The potential of a receptor to be significantly affected (EPA, 2022).
Significance	The importance of the outcome of the impact (or the consequence of change) for the receiving environment (EPA, 2022).
Sound	The terms noise and sound are often used interchangeably. Sound is a broad term that refers to any auditory experience created by vibrations that travel through a medium such as air, water, or solids to the ear.
Sound exposure level	A metric used to measure the cumulative sound energy exposed to a receptor.
Sound pressure	Measurement of the resulting change in pressure due to particle vibration in fluid or gas.
Source	The activity or place from which an effect originates (EPA, 2022)

Term	Meaning
Special Areas of Conservation (SACs)	Sites designated under the Habitats Directive (92/43/EEC). This requires the conservation of important, rare or threatened habitats and species (not birds, which are protected by Special Protection Areas (SPAs)) across Europe (Office of the Planning Regulator, n.d.).
Special Protection Areas (SPAs)	Sites designated under the Birds Directive (79/409/EEC), to conserve the habitats of certain migratory or rare birds (Office of the Planning Regulator, n.d.).
Sub Lease Area	Area where the ABWP Phase I WTGs, met mast and inter-array cables are located, as defined in the Sub Lease granted by Sure Partners Limited (SPL) to Arklow Energy Limited (Arklow Energy) to construct and operate ABWP Phase I.
Temporary Threshold Shift (TTS)	A recoverable reversible increase in the threshold of audibility.
Transition Piece	The steel connection structure between the tower and the monopile (MP) foundation.
Waste	Any substance or object belonging to a category of waste specified in the First Schedule or for the time being included in the European Waste Catalogue which the holder discards or intends or is required to discard, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved (Waste Management Act 1996 (as amended)).
Waste Hierarchy	The order of preference for managing waste, prioritising prevention, reuse, recycling and recovery ahead of disposal.
Wind Turbine Generator (WTG)	Structure that converts the kinetic energy of ocean winds into electrical energy. ABWP Phase I includes seven GE Energy 3.6s WTGs with a rated capacity of 3.6 megawatts (MW) per WTG.

Acronyms

Acronym	Meaning
AA	Appropriate Assessment
ABWP	Arklow Bank Wind Park
ACP	An Coimisiún Pleanála
AUD INJ	Auditory Injury
BHD	Backhoe dredger
CL	Conservation Limit
cSACs	Candidate SACs
CSD	Cutter Suction Dredger
DaS	Dumping at Sea
DCEE	Department of Climate, Energy and the Environment
DEMP	Decommissioning Environmental Management Plan
DP	Dynamic Positioning
EC	European Commission
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
HWM	High Water Mark
IEMA	Institute of Environmental Management and Assessment

Acronym	Meaning
IMO	International Maritime Organisation
IROPI	Imperative Reasons of Overriding Public Interest
ISEP	Institute of Sustainability and Environmental Professionals
JNCC	Joint Nature Conservation Committee
JUB	Jack Up Barge
LAT	Lowest Astronomical Tide
MARA	Maritime Area Regulatory Authority
MBES	Multi-beam echo sounder
MMOb	Marine Mammal Observer
MP	Monopile
MSFD	Marine Strategy Framework Directive
NIS	Natura Impact Statement
NMFS	United States National Marine Fisheries Service
NPWS	National Parks and Wildlife Service
O&M	Operations and Maintenance
OMF	Operations and Maintenance Facility
OPR	Office of the Planning Regulator
OSP	Offshore Substation Platform
pSPAs	proposed SPAs
PTS	Permanent Threshold Shift
QI	Qualifying interest
SAC	Special Area of Conservation
SBP	Sub-bottom profiling
SCI	Special Conservation Interests
SEL	Sound exposure level
SELcum	Cumulative sound exposure level
SPA	Special Protection Area
SPL	Sound pressure level
SPLpeak	Peak sound pressure level
SPLrms)	Root-mean-square sound pressure level
SPRT	Soil Plug Removal Tool
SSC	Suspended Sediment Concentration
SSS	Side Scan Sonar
TP	Transition Piece
TTS	Temporary Threshold Shift
USBL	Ultra-short baseline
VMP	Vessel Management Plan
WMP	Waste Management Plan
WTG	Wind Turbine Generators
ZoI	Zone of Influence

Units

Unit	Meaning
dB	Decibel
Hz	Hertz
kHz	Kilohertz
km	Kilometres
L	Litre
m	Metre
mg	Milligram
MW	Megawatts
nm	Nautical mile

1 INTRODUCTION

1.1 Overview

1.1.1.1 Arklow Energy Limited (Arklow Energy) is seeking planning permission to decommission Arklow Bank Wind Park (ABWP) Phase I (referred to hereafter as 'the Proposed Works'). The Proposed Works include decommissioning of ABWP Phase I offshore infrastructure (Proposed Works Offshore) and decommissioning of ABWP Phase I onshore infrastructure (Proposed Works Onshore).

1.1.1.2 This Stage 2 Natura Impact Statement (NIS) follows on from the **Appropriate Assessment (AA) Screening Report** (prepared in support of the application for planning permission of the Proposed Works) and further considers potential effects on European Sites as a result of the Proposed Works. This report provides Stage 2 of the AA process and considers the habitats and species screened in during Stage 1 AA Screening Report to understand if there will be an adverse effect on the integrity of any 'screened in' European Site from the Proposed Works.

1.1.1.3 The Stage 1 **AA Screening Report** identified no likely significant adverse effects on onshore European Sites, or in relation to Proposed Works Onshore, and therefore these have not been considered further in this Stage 2 NIS.

1.1.1.4 This Stage 2 NIS has been prepared in parallel to the Environmental Impact Assessment Report (EIAR), prepared in support of the planning application for Proposed Works.

1.2 Legislative Background

1.2.1.1 The European Union (EU) Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') requires that Member States contribute to the creation of a coherent ecological network of sites through the identification and designation of Special Areas of Conservation (SACs), including candidate SACs (cSACs), relating to habitats and species listed in Annex I and Annex II of the Habitats Directive respectively. The EU Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive') requires the protection of bird species listed in Annex I of the Birds Directive, and of regularly occurring migratory bird species and their habitats, including through the designation of Special Protection Areas (SPAs), including proposed SPAs (pSPAs).

1.2.1.2 SACs and SPAs are referred to as European sites and are collectively part of the Natura 2000 network, comprising a network of areas of highest biodiversity importance for rare and threatened habitats and species across the EU.

1.2.1.3 In Ireland, habitats and/or species which are the reason(s) for the designation of an SAC are referred to as 'Qualifying Interests' (QIs). For SPAs, bird species and their habitats which are the reason for a particular site designation are referred to as 'Special Conservation Interests' (SCIs). In this NIS, QIs and SCIs are together referred to as qualifying features.

1.2.1.4 Article 6(3) of the Habitats Directive requires that, "Any plan or project not directly connected with or necessary to the management of the (European) site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the (European) site in view of the (European) site's conservation objectives. In the light of the conclusions of the assessment of the implications for the (European) site and subject to the provisions of paragraph 41, 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 (European) site concerned and, if appropriate, after having obtained the opinion of the general public."

1.2.1.5 Article 6(2) provides an initial two-stage process:

- Screening for AA to identify the need for an AA; and
- AA, only applicable if screening for AA concludes that an AA is required.

1.2.1.6 This NIS has been prepared on behalf of Arklow Energy to inform and support the AA conducted by the Competent Authority.

1.2.1.7 For the purposes of applications for planning permission in Ireland, Part XAB of the Planning and Development Act 2000 (as amended), transposes the obligations under the Habitats and Birds Directives into Irish law.

2 METHODOLOGY

2.1 Overview of Appropriate Assessment Process

2.1.1.1 Article 6 of the Habitats Directive establishes a step-wise procedure to undertake an AA, as illustrated in **Figure 2.1**. This is further described in European Commission (EC) guidance (EC, 2001; 2019; 2020; 2021), as well as in Irish guidance (Environment, Heritage and Local Government, 2009; MDB, 2017; Office of the Planning Regulator (OPR), 2021) and summarised in this section.

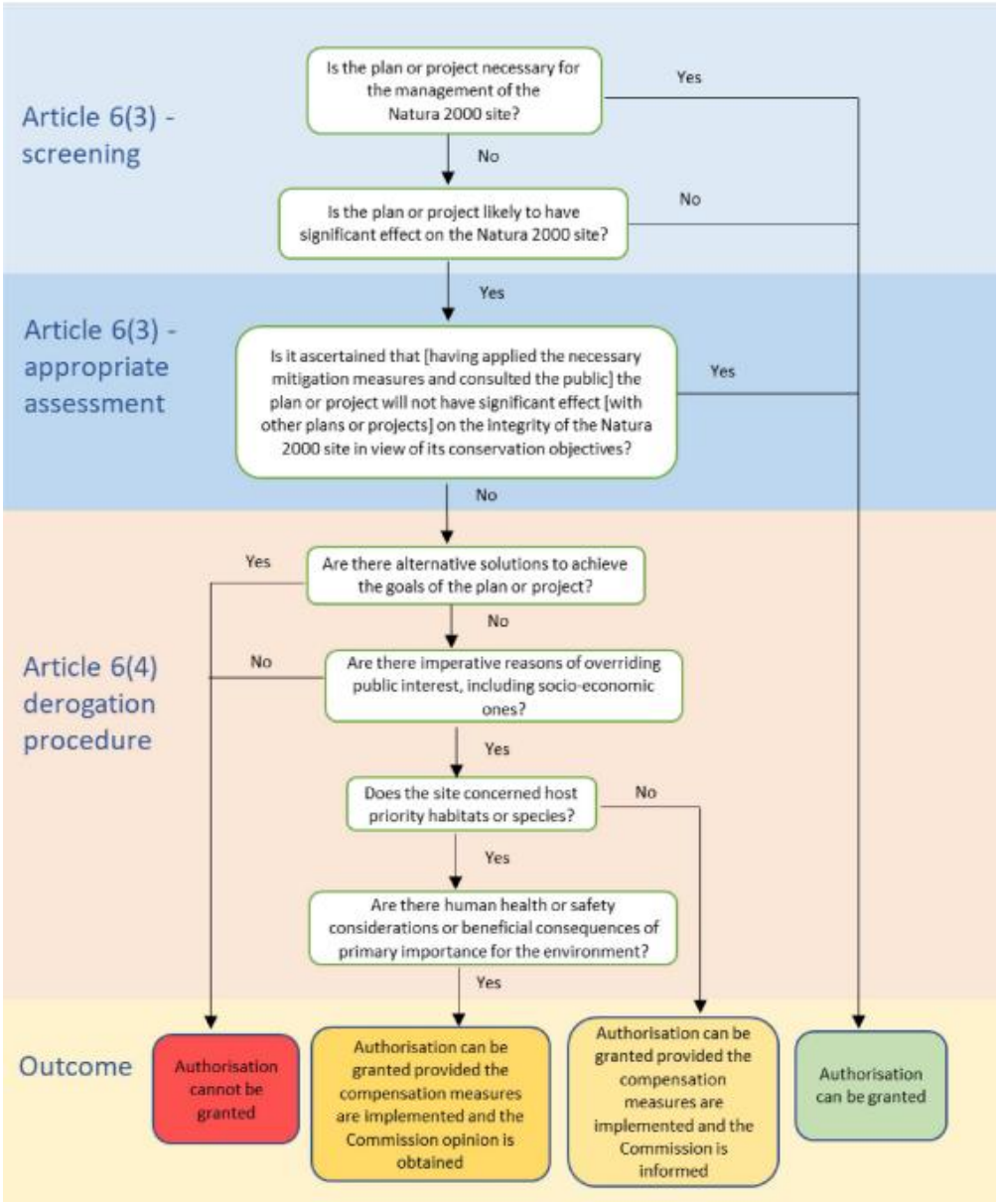

Figure 2.1: Appropriate Assessment process.

Source: EC (2021)

2.1.2 Stage 1 – Screening

2.1.2.1 The first stage in the AA process is to determine whether an AA is required, which is determined through 'screening'. This step is used to address and record the reasoning and conclusions on whether, firstly, the plan or project is directly connected with, or necessary to, the management of any given European site, and secondly, whether it is likely to have a significant effect on a European site, either alone or in combination with other plans or projects.

2.1.2.2 Screening involves the following stages:

- ascertaining whether the plan or project is directly connected with or necessary to the management of a European site;
- identifying the relevant elements of the plan or project and their likely impacts;
- identifying which (if any) European sites may be affected, considering the potential effects of the plan or project alone or in combination with other plans or projects; and
- assessing whether Likely Significant Effects on the European site can be ruled out, in view of the European site's conservation objectives (COs).

2.1.2.3 An AA Screening has been undertaken for the Proposed Works and is provided in the **AA Screening Report** (prepared in support of the application for planning permission of the Proposed Works).

2.1.3 Stage 2 – Appropriate Assessment

2.1.3.1 The second stage in the AA process involves considering the impact of a project or plan alone and in-combination with other projects or plans on the integrity of a given European site with respect to its COs and to its structure and function. In Ireland, data and information on the project and on the site and an analysis of potential effects on a given European site must be obtained and presented by the applicant in an NIS.

2.1.3.2 Following the results of Stage 1 Screening provided in the AA Screening Report (prepared in support of the application for planning permission of the Proposed Works), the Competent Authority will undertake a Stage 2 AA, informed by this NIS. Section 177V, Part XAB of the Planning and Development Act 2000 indicates that an AA shall include a determination by the Competent Authority as to whether a draft land use plan or proposed development would adversely affect the integrity of a European site. As per Section 177V(2) "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 (this report);

(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; and

(g) any other relevant information."

2.1.3.3 The NIS has been prepared to support and provide information to enable the Competent Authority to carry out the AA, including information on the plan or project, its location, extent and receiving environment, the Natura 2000 sites, their COs and ecological and environmental sensitivities, and the likely or potential effects of the plan or project. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned.

2.1.4 Stage 3 – Alternative Solutions

2.1.4.1 The third stage examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a European site. The process must return to Stage 2 as alternatives will require AA to proceed. Demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, is necessary to progress to Stage 4. Stage 3 does not apply to Proposed Works.

2.1.5 Stage 4 – Imperative Reasons of Overriding Public Interest / Derogation

2.1.5.1 Stage 4 is the main derogation process of Article 6(4) (**Figure 2.1**) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a European site to proceed in cases where it has been established that no less damaging alternative solution exists.

2.1.5.2 The extra protection measures for Annex I priority habitats come into effect when making the IROPI case, in which case compensatory measures, required to be practical, implementable, likely to succeed, proportionate and enforceable, must be proposed and assessed, subsequently approved by the Minister and shared with the EC for information.

2.1.5.3 Section 177W of Part XAB of the Planning and Development Act 2000 regulates the process for invoking IROPI. Stage 4 does not apply to Proposed Works.

3 PROPOSED WORKS OFFSHORE

3.1.1.1 This section describes the location and characteristics of the decommissioning of offshore infrastructure (the Proposed Works Offshore) for the purposes of the NIS.

3.1.2 Location of the Offshore Site

3.1.2.1 The Proposed Works Offshore will be undertaken within the Offshore Site (see **Figure 3.1** for layout of Offshore Site), which includes:

- The Sub Lease Area, located on the long narrow Arklow Bank sand bank, situated approximately 10 km off the coast of Arklow, south east Ireland, where wind turbine generators (WTGs) and associated scour protection, inter-array cables and met mast are located; and
- A 10 m cable corridor along the export cable route connecting T4 to the landfall point at High Water Mark (HWM).

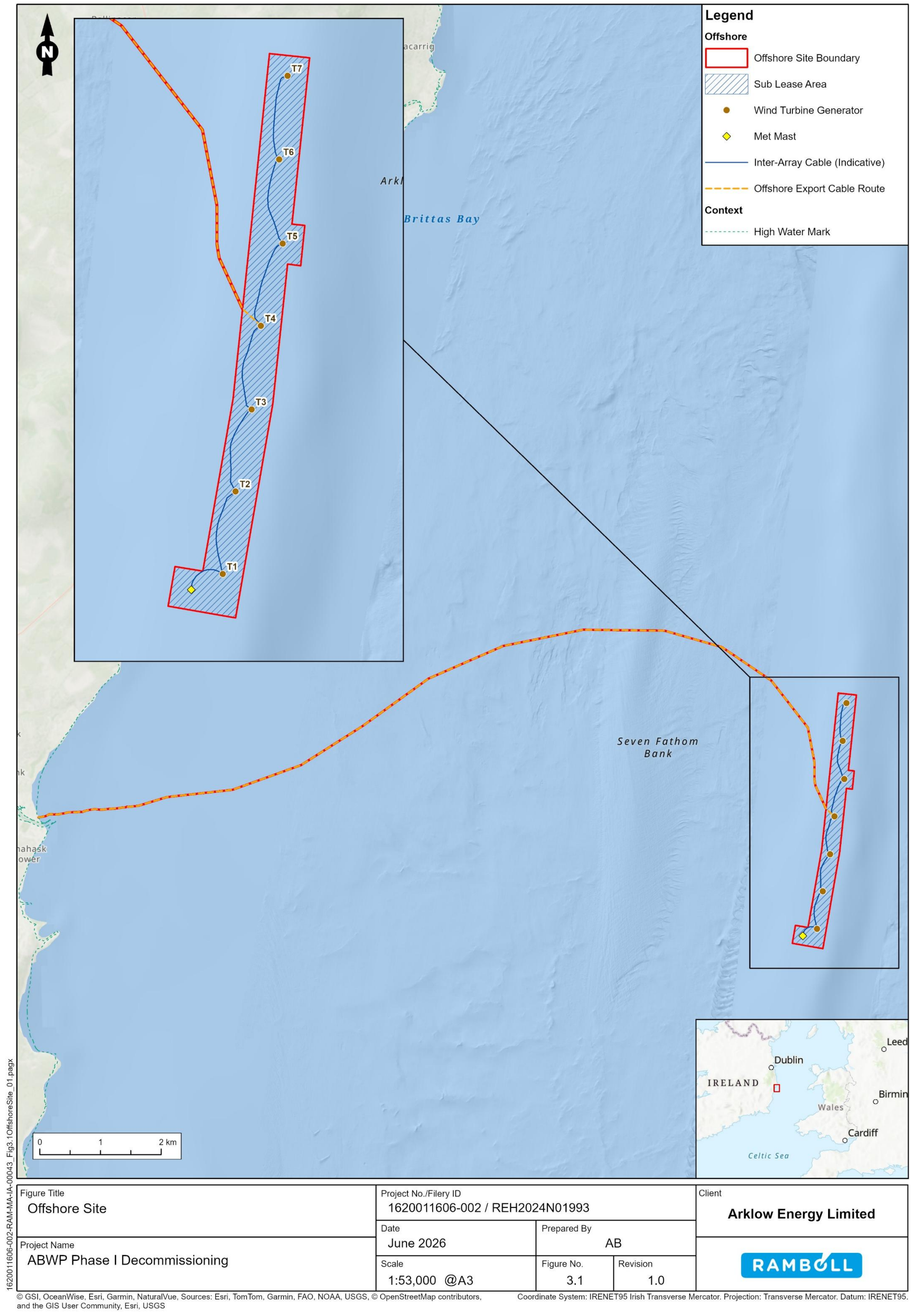

Figure 3.1: Offshore Site

3.1.3 Offshore Site Description

3.1.3.1 The following Offshore Site description provides a baseline of marine features associated with European Sites identified in the **AA Screening Report** (prepared in support of the application for planning permission of the Proposed Works) as having the potential for likely significant effects. Background information on the sediment composition and local hydrodynamics within the Offshore Site is also provided.

3.1.3.2 The Study Areas identified in the AA Screening Report (prepared in support of the application for planning permission of the Proposed Works) for marine receptor groups and European Sites are:

- Migratory Fish – up to 50 km on a precautionary basis, including consideration of migratory routes guided by ABPmer (2014); and
- Marine Mammals – up to 45.5 km, based on the maximum distance for disturbance effects resulting from underwater noise, as identified in **Volume 3, Appendix 5.2: Underwater Sound Modelling Report** of the EIAR.

3.1.3.3 A detailed baseline description of marine receptors in the Study Areas defined above is provided in **Volume 2, Chapter 5: Marine Biodiversity** of the EIAR.

3.1.3.4 Over and around Arklow Bank, the tidal currents are strong and generally align with the bank's north–south orientation (see **Volume 2, Chapter 4: Coastal Processes, Water and Sediment Quality** of the EIAR). The substratum on the Arklow Bank sand bank, where the Sub Lease Area is located, is largely characterised by mobile sandy sediment with some coarser sediment to the east and north. Closer to the Arklow Harbour, along the export cable route, the substratum has been reported to be muddy sand. The average suspended sediment concentration near Arklow Bank is less than 2.5 mg/l, but higher concentrations are recorded in winter (see **Volume 2, Chapter 4** of the EIAR).

3.1.3.5 Tidal currents at Arklow Bank are strong and generally align with the bank's north–south orientation (**Volume 2, Chapter 4** of the EIAR). The flow along the bank is typically bidirectional with flood tides streaming northwards and ebb tides streaming south. The tidal currents are considered to be a dominating factor in the morphology of Arklow Bank and sediment transport, with net sediment transport away from the centre of the bank (**Volume 2, Chapter 4** of the EIAR). As Arklow Bank is characterised by highly dynamic sand, sediment transport and bedform migration is continuous across the entire bank.

3.1.3.6 Several migratory fish species are known to be present in the migratory fish Study Area, including Atlantic salmon (*Salmo salar*), sea trout (*Salmo trutta*), river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*) and twaite shad (*Alosa fallax*) due to several rivers flowing into the western Irish Sea (APEM, 2026a).

3.1.3.7 Salmon is an anadromous species (migrating from the sea into freshwater to spawn) present in several rivers in the migratory fish Study Area including the Avoca River (APEM, 2026a) which flows into the migratory fish Study Area through Arklow Harbour and the River Vartry (20.76 km north) (Fisheries Ireland, 2022). Salmon is also a qualifying feature of the River Slaney SAC (13.9 km west) and the River Barrow and River Nore SAC (49.7 km south). Atlantic salmon are considered likely to migrate south west out of the River Barrow and River Nore SAC away from the Offshore Site, but northerly migration cannot be ruled out (APEM, 2026a) In recent years, salmon has drastically declined due to marine mortality, with climate change and bycatch considered to be leading factors (Salmon Watch Ireland, 2025).

3.1.3.1 River and sea lamprey both occur in the coastal waters of County Wicklow (APEM, 2026a) in the migratory fish Study Area. Lamprey species are also present in the Avoca River and catchment which flows into Arklow Harbour next to the landfall. However, the population is considered small compared to other species present in the Avoca River catchment (Corcoran *et al*., 2025). Sea and river lamprey are designated features of the Slaney River SAC (13.9 km west) and the River Nore and River Barrow SAC (49.7 km south west). Lamprey are thought to spawn in clean gravel area of the River Slaney over spring and summer with July marking the end of the spawning season (APEM, 2026a).

3.1.3.1 Twaite shad also occurs in the coastal waters of County Wicklow (APEM, 2026a) and is a designated feature of the Slaney River SAC (13.9 km west) and the River Nore and River Barrow SAC (49.7 km south west). The River Nore and River Barrow SAC provides an important spawning ground for twaite shad, which is considered to be one of the only spawning locations in Ireland for twaite shad (Department of Housing, Local Government and Heritage, 2024). The main area for spawning is considered to be downstream of the St Mullins weir located in the River Barrow (Gallagher *et al*., 2023).

3.1.3.2 Harbour porpoise has been recorded throughout the Irish Sea (Evans and Waggitt, 2023; Giralt Paradell *et al.,* 2024). The species has preferences for certain habitats, particularly high tidal energy coastal areas around the Welsh coast and between County Dublin and County Waterford in Ireland (where the marine mammal Study Area is located) (Evans and Waggitt, 2023). ObSERVE 2023 survey data has also indicated hotspots of harbour porpoise activity around Wicklow and south of Arklow (Giralt Paradell *et al*., 2024) including Blackwater Bank SAC (located 29.2 km south and for which harbour porpoise is a qualifying feature). Harbour porpoise were also regularly recorded in waters surrounding the Offshore Site during surveys undertaken for ABWP Phase II (APEM, 2026b; HiDEF, 2020).

3.1.3.3 Harbour seal is considered present in coastal, estuarine and marine environments around the Irish coastline. Seals 'haul-out' in coastal areas for breeding, nursing, moulting and resting (SCOS,2025). Harbour seal is known to haul-out at several sites in the vicinity of the Offshore Site, including Wexford Harbour (55 km south) in the estuary of the Slaney River Valley SAC (for which harbour seal is a qualifying feature) where a population of approximately 50 seals is present (Morris and Duck, 2019). An important haul-out site is also located at Lambay Island SAC with approximately 60 seals, located around 74 km north from the Offshore Site. When harbour seals leave haul-out sites to forage, some individuals have been observed to travel up to 273 km (Carter, *et al*., 2022). However, mean at-sea usage of harbour seals in the Irish Sea indicates low presence of harbour seal around the Offshore Site, with activity concentrated around haul-out sites (Carter *et al*., 2022; Russell *et al*., 2017).

3.1.4 Proposed Works Offshore Activities

3.1.4.1 A summary of Proposed Works offshore and vessels / plant anticipated is presented in **Table** 3.1.

Table 3.1: Overview of Proposed Works Offshore

Activities	Anticipated approach / methods	Anticipated vessels required
Pre-decommissioning surveys	Geophysical / Remote Operating Vehicle (ROV) / diver surveys undertaken to confirm bathymetric conditions, identify any obstructions and hazards, and update the decommissioning methodology and programme.	Survey vessel equipped with: • Multi-beam Echosounder (MBES) • Side Scan Sonar (SSS) • Sub-Bottom Profilers (SBP) • Magnetometer • ROV • Dynamic Positioning (DP) • Ultra-Short-Baseline (USBL) acoustic positioning systems
Dredging (to facilitate safe vessel access, if required)	Subject to vessel requirements and bathymetric conditions found at the time of decommissioning: • Pre-dredging bathymetric surveys to confirm bathymetry conditions and refine dredging / disposal areas (if any required), volume estimates and methodologies (to be kept within limits / requirements of Dumping at Sea (DaS) permit); • Dredging within Sub Lease Area using: – a Cutter Suction Dredger (CSD), with disposal via pipeline / sidecasting within the Sub Lease Area; – a backhoe dredger (BHD), with disposal via sidecasting within the Sub Lease Area;	• Survey vessel equipped with MBES; • CSD supported by a single small tugboat and a shallow draft small survey vessel (equipped with MBES); • BHD supported by a single small tugboat and a single split hopper barge, and a shallow draft survey vessel; and/or • Plough dredger supported by a small survey vessel, equipped with MBES.

Activities	Anticipated approach / methods	Anticipated vessels required
	– plough dredging, if required to maintain required depth within vessel access channels created following dredging with the above methods.	
Decommissioning of wind turbine generators (WTGs)	Reversal of the installation process: • Preparation works, including inspection, removal / securing loose items, etc; • Position of JUB for pre-load and jack up to working height; • Completion of safety checks and preparation of the WTG for lifting; • Full de-energising of the WTG, routing power supply from JUB if required for dismantling; • Permanent removal of rotor and blades; • Disconnection of power and signal cables between the nacelle and tower before removing nacelle; and • Disconnection of power and signal cables between the tower and the TP/ lift system before removing the tower.	Jack Up Barge (JUB) supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems
Decommissioning of meteorological (met) mast	Dismantled in two separate sections. The triangular platform will subsequently be dismantled using the similar plant and lifting equipment used during WTG decommissioning.	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems
Decommissioning of transition pieces (TPs)	• Position of JUB for pre-load and jack up to working height. Position of transport barge next to JUB and of gangway next to the TP to provide safe access; • General inspection of the TP before preparation activities for safety purposes; • Removal / securing of loose items inside and outside of the TP; • Installation and non-destructive testing of new lifting points, if required; • Securing of TP to crane for lifting before executing the cuts; and • Lifting of cutting equipment, as well as TP, transferred to the JUB or transport barge.	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems
Decommissioning of foundations	• Following removal of the TP, then the seabed material inside MPs is extracted using a soil plug removal tool (SPRT). The target dredging depth will be 3 m below the target cutting depth to ensure cutting equipment can be safely operated. • Dredged material will be released via pipeline within 100 m from MP locations at the same time as being dredged; • Use of jetting, vibratory or any other friction removal equipment around the MP, if required; • Installation of the internal cutting equipment inside the MP at the required cutting elevation; • Securing of the MP to crane for lifting before cutting the MP at the target cutting depth; • Holding and then lifting the MP whist activating the equipment intended to remove potential shaft friction; and • Transfer of cutting equipment and MP onto the JUB and transport barge respectively.	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems
Scour protection removal	• Position of support vessel equipped with MBES and grab dredger next to the MP;	• Grab dredger

Activities	Anticipated approach / methods	Anticipated vessels required
	• Guiding of the grab dredger to grab the individual sandbags identified and mapped during MBES, and to lift them from the seabed to a skip located in a supporting barge; and • Recovering of sandbags and release of material back into the seabed via side casting.	• Small barge equipped with MBES and a skip to temporarily store the content of sandbags
Inter-array cable removal	• Position of the multicat vessel at the designated location near the WTG where the cable needs to be recovered; • Unburial of cable using a running method, pulled out using clamps and a cable puller, towed slowly across the seafloor; and • Cutting of cables underwater or on vessel deck with shears into manageable sections, deposited in containers.	• Multicat vessel of shallow draft equipped with a running method
Offshore export cable removal	• Position of the multicat vessel at the designated location near the WTG where the cable needs to be recovered; • Unburial of cable with a running method, pulled out using clamps and a cable puller; • The offshore export cable will be severed by grapple and shears vicinity of the landfall, left exposed on the seabed until this is pulled from land; and • Cables will be cut underwater or on vessel deck with shears into manageable sections, deposited in containers for subsequent transfer to port.	• Multicat vessel of shallow draft equipped with a running method
Post-decommissioning survey	Geophysical survey undertaken to verify the resulting seabed condition within the Offshore Site.	Survey vessel equipped with: • MBES • SSS • SBP • Magnetometer • DP • USBL acoustic positioning systems

Vessels and Equipment

3.1.4.2 To allow for safe vessel access during the Proposed Works Offshore, it is proposed to establish a work area around the Sub Lease Area demarcated with 12 buoys across a total length of 4,817 m and a total width of 1,605 m (see **Volume 3, Appendix 3.8: Lighting and Marking Plan** of the EIAR). Each buoy shall be marked with a 'Yellow Special Mark' and a yellow light used in a flashing pattern, synchronised with other buoys, with a light range of 5 nm (approximately 9.2 km).

3.1.4.3 Once the work area has been established, flashing yellow marine lanterns on the WTGs, currently used in the operational phase, as described in **Volume 3, Appendix 3.8: Lighting and Marking Plan** of the EIAR, shall be turned off. Therefore, flashing yellow lights on buoys and flashing yellow lights on the WTGs / met mast will not be operational at the same time.

3.1.4.4 Along the offshore export cable corridor, a 500 m mobile work area will also be implemented around the Proposed Works Offshore.

3.1.4.5 The vessels to complete Proposed Works Offshore have not yet been confirmed. However, for the purposes of this assessment, vessel types and maximum number of vessel trips have been assumed for each activity and are described in **Table 3.2**.

3.1.4.6 At this stage, it is anticipated that the main decommissioning vessels will be mobilised from a European port, assuming a transit duration of up to 15 days.

3.1.4.7 ABWP Phase I decommissioned components will be taken to an available Irish port (Rosslare, Waterford, Dublin and Greenore are potential ports being considered at this stage).

3.1.4.8 Upon arrival to the selected port, components will be unloaded using the vessel's main crane, auxiliary cranes/ and land cranes to optimise the programme. Components will subsequently be transferred and processed for reuse, recycle or disposal on land in line with legal requirements, transferred to suitable and licenced waste management facilities in Ireland or outside or Ireland in line with the detailed Offshore Waste Management Plan (WMP) (see outline version in **Volume 3, Appendix 3.8: Outline Offshore WMP** of the EIAR).

Table 3.2: Vessel types and maximum number of vessel trips

Proposed Works Offshore	Vessel type	Maximum number of vessel trips
Pre-decommissioning Surveys	Survey vessel.	• 2 vessel trips on any given day; and • 20 vessel trips considering a single campaign (with a maximum duration of 10 days).
Dredging (if required)	Survey vessel (pre-dredging surveys).	• 2 vessel trips on any given day • 48 vessel trips considering a single campaign
	• Medium-sized CSD; • Small tugboat; and • Small survey vessel.	• 3 vessel trips on any given day (for all three vessel types engaged in dredging works, one way); and • 48 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.
	• Medium-sized BHD; • Small tugboat; • Small split hopper barge; and • Small survey vessel.	• 4 vessel trips on any given day (for all four vessel types engaged in dredging works, one way); and • 64 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.
	• Barge equipped with a plough; and • Small survey vessel.	• 2 vessel trips on any given day (for both vessel types engaged in dredging works, one way); and • 16 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.
Decommissioning of WTGs / met mast	• JUB supported; • Two tugboats; and • Transport barge.	• 4 vessel trips on any given day (for all four vessel types, one way); and • 12 vessel trips considering all WTGs and met mast are decommissioned within the same campaign.
Decommissioning of TPs **Decommissioning of Foundations**	• JUB supported; • Two tugboats; and • Transport barge.	• 4 vessel trips on any given day (for all four vessel types, one way); and • 10 vessel trips considering all TP/MPs are decommissioned within the same campaign.
Scour Protection Removal	• Grab dredger; and • Small barge.	• Maximum number of vessel trips on any given day: 4 (2 for each vessel type, return trips); and • Maximum number of vessel trips per campaign: 80.
Decommissioning of inter-array cables	Multicat vessel equipped with a running method.	• 2 vessel trips on any given day (one vessel engaged only, two ways); and • 16 vessel trips within the same campaign.
Decommissioning of the offshore export cable	Multicat vessel equipped with a running method.	• 2 vessel trips on any given day (one vessel engaged only, two ways); and • 19 vessel trips within the same campaign.
Post-decommissioning Surveys	Survey vessel.	• 2 vessel trips on any given day; and • 20 vessel trips considering a single campaign (with a maximum duration of 10 days).

3.1.4.9 The equipment to be used will also be confirmed in the final decommissioning method statement. For the purposes of this assessment, the following have been assumed:

Table 3.3: Summary of equipment anticipated to be used

Equipment	Purpose	Operating underwater frequency / Sound Pressure Levels	Effort
Multibeam Echosounder (MBES)	Update the characterisation of the seabed (e.g. bathymetry, seabed morphology, obstructions / hazards) in high resolution.	• 200 – 700 kHz • 200-213 dB re 1 µPa @1m	During pre-decommissioning surveys (all equipment): • Three days / max twice per year (when covering the Offshore Site only) • 10 days / max twice per year (when also covering the offshore export cable route) During pre-dredging surveys (MBES only): • Three days / max 16 times per year During scour protection removal (MBES only): • 20 days (throughout duration of scour protection removal works) During post-decommissioning surveys (all equipment): • 10 days / once after all Proposed Works Offshore are completed
SBP chirp	Update the characterisation of sediments and geological layers beneath the seabed (e.g. sediment thickness, cross-sectional profiles, cable burial depths, obstructions / hazards).	• 0.2 to 14 kHz	
SSS	Complement the updated characterisation of the seabed undertaken by MBES adding imagery detail.	• 400 kHz • SPL 210 dB re 1 µPa @1m	
USBL	Used for acoustic positioning	• 21 – 31 kHz • SPL 181 dB re 1 µPa @1m	
Magnetometer	Detect and map magnetic anomalies on or below the seabed.	Passive device (i.e. it does not emit any sound waves into the marine environment)	
Underwater mechanical cutting tool	To cut the MP to release the TP (may be undertaken above or below water)	• 0.1 – 2 kHz • root-mean-square sound pressure level (SPLrms) 175 dB re 1 µPa @1m	Part of TP/MP removal works, which have a duration of 9.5 days
Internal DOP pump	Submersible dredge pump used to remove seabed material inside MPs	Negligible, as dredging will be undertaken inside the MP structure	Part of TP/MP removal works, which have a duration of 9.5 days
CSD	May be required to facilitate safe vessel access depending on seabed levels encountered at the time of decommissioning. Only one channel would be dredged / maintained at any given time. Dredging and associated disposal works will only take place within the Sub Lease Area.	• 0.1 to 2 kHz • SPLrms 179 dB re 1µ Pa @ 1m	• For -4.5 m LAT target seabed depth: up to 7 days per vessel access channel • For -6 m LAT target seabed depth: up to 11 days per vessel access channel
BHD			• For -4.5 m LAT target seabed depth: up to 9 days per vessel access channel • For -6 m LAT target seabed depth: up to 15 days per vessel access channel
Plough dredger			Up to 9.5 days per vessel access channel
Grab dredger	Used to remove scour protection		• 20 days within 30 m from MP locations

Equipment	Purpose	Operating underwater frequency / Sound Pressure Levels	Effort
Running method	Used to remove inter-array and offshore export cables		• Inter-array cables – 20 days within the Sub Lease Area only • Offshore export cable – 35 days along the cable route only

Design Measures

3.1.4.10 Design measures include measures integrated in the definition of Proposed Works Offshore, and include:

- Modifications arising through the iterative design / methodology development process; and
- Standard industry practice that would occur even without input from the AA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects.

3.1.4.11 **Table 3.4** outlines design measures that are considered as part of the Proposed Works Offshore and relevant to this document, which will be assumed to be effectively implemented. It should be noted that none of these design measures are intended to avoid or reduce potential impacts to European Sites, but are considered integrated elements in the definition of Proposed Works Offshore.

Table 3.4: Design measures relevant to Proposed Works Offshore

Design Measures	Description
Development and adherence to the Detailed Offshore Decommissioning Environmental Management Plan (DEMP)	**Volume 3, Appendix 3.4: Outline Offshore DEMP** of the EIAR presents standard industry practice and legal requirements for environmental management and mitigation that will be implemented as part of the Proposed Works Offshore. The outline Offshore DEMP also summarises any required additional mitigation identified in relevant EIAR chapters, serving as a framework for the future decommissioning contractor(s) to develop in detail before decommissioning works commence
Development and adherence to the Detailed Vessel Management Plan (VMP)	**Volume 3, Appendix 3.5: Outline VMP** of the EIAR defines best-practice vessel management measures, including transit routes, speed restrictions, timing of activities, pollution prevention, and crew environmental awareness, to minimise disturbance, collision risk, and ecological harm.
	The Detailed VMP will include requirements under the International Convention for the Control and Management of Ships' Ballast Water and Sediments with the aim of preventing the spread of marine INNS (International Maritime Organisation (IMO), 2024) and the IMO Guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (Biofouling Guidelines) (IMO, 2023).
Development and adherence to the Detailed Offshore Waste Management Plan (WMP)	**Volume 3, Appendix 3.8: Outline Offshore WMP** of the EIAR stablishes a clear framework for the identification, handling, and management of wastes arising from Proposed Works Offshore, ensuring compliance with standard industry practice and relevant waste legislation, and the principles of the waste hierarchy. Specific waste-related plans for ships and offshore operations is a requirement under MARPOL (The International Convention for the Prevention of Pollution from Ships)

Programme

3.1.4.12 The Proposed Works Offshore (including pre- and post- decommissioning surveys) are planned to take place during favourable weather windows, with main offshore works carried out over spring and summer months where possible. The exact programme is subject to the availability of the supply chain and weather conditions, and will therefore, be confirmed closer to the time. Working

times may be extended to periods of '24/7' where safe to do so in order to accelerate the programme.

3.1.4.13 The anticipated duration of individual Proposed Works Offshore activities, excluding any potential downtime due to mechanical failures or weather, is outlined below, some of which may take place in parallel:

- Pre-decommissioning surveys – between 3 and 10 days, undertaken within 6 weeks before any decommissioning campaign and may need to be repeated on a six month interval basis to identify favourable seabed level conditions;
- Met mast decommissioning – maximum 3 days;
- WTG decommissioning – up to 6.5 days per WTG;
- TP/MP decommissioning – maximum 9.5 days per TP/MP;
- Scour protection removal – up to 20 days;
- Inter-array cables – up to 20 days;
- Offshore export cable – up to 35 days; and
- Post-decommissioning surveys – maximum of 10 days.

3.1.4.14 It is anticipated that Proposed Works Offshore will be executed in two main campaigns:

- First campaign, focused on the decommissioning of WTGs and met mast; and
- Second campaign, focused on the decommissioning of TPs/MPs, scour protection removal and inter-array and offshore export cable removal; as well as post-decommissioning surveys.

3.1.4.15 It should be noted that if there are programme gap(s) between campaigns lasting more than one year, then the work area, demarcated with buoys, will be removed during these programme gap(s) when no Proposed Works Offshore take place. During these potential programme gap(s), existing marine marking will be reinstated, with marine marking placed on the TPs.

4 SCOPE OF STAGE 2 ASSESSMENT

4.1 Results of Stage 1 AA Screening

4.1.1.1 The Stage 1 AA Screening Report (see the **AA Screening Report** prepared in support of the application for planning permission of the Proposed Works) identified three European Sites with marine qualifying features (Slaney River Valley SAC, Blackwater Bank SAC and River Barrow and River Nore SAC) within the potential Zones of Influence (ZoIs) of the Proposed Works Offshore (see **Section 5**). Likely significant effects on the qualifying features of these sites from increased suspended sediment concentration (SSC) and associated deposition, and injury and/or disturbance from underwater noise could not be excluded at the Stage 1 – AA Screening. Therefore, the following three European Sites (see **Figure 4.1**) and their relevant marine qualifying features have been considered for the following relevant impact pathways:

- Increased SSC and associated deposition – Slaney River Valley SAC, and River Barrow and River Nore SAC; and
- Injury and/or disturbance from underwater noise – Slaney River Valley SAC and Blackwater Bank SAC.

4.1.1.2 This NIS provides the information needed for the Competent Authority to conduct an AA to further consider the potential for these impact pathways screened in for each European Site to result in adverse effects on the integrity of that site, in view of its COs.

4.2 Guidance

4.2.1.1 This NIS has been prepared in compliance with guidance provided by the European Commission on the *Assessment of Plans and Projects in relation to Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC* (European Commission, 2021), which provides a methodological approach to conducting Stage 2 AA.

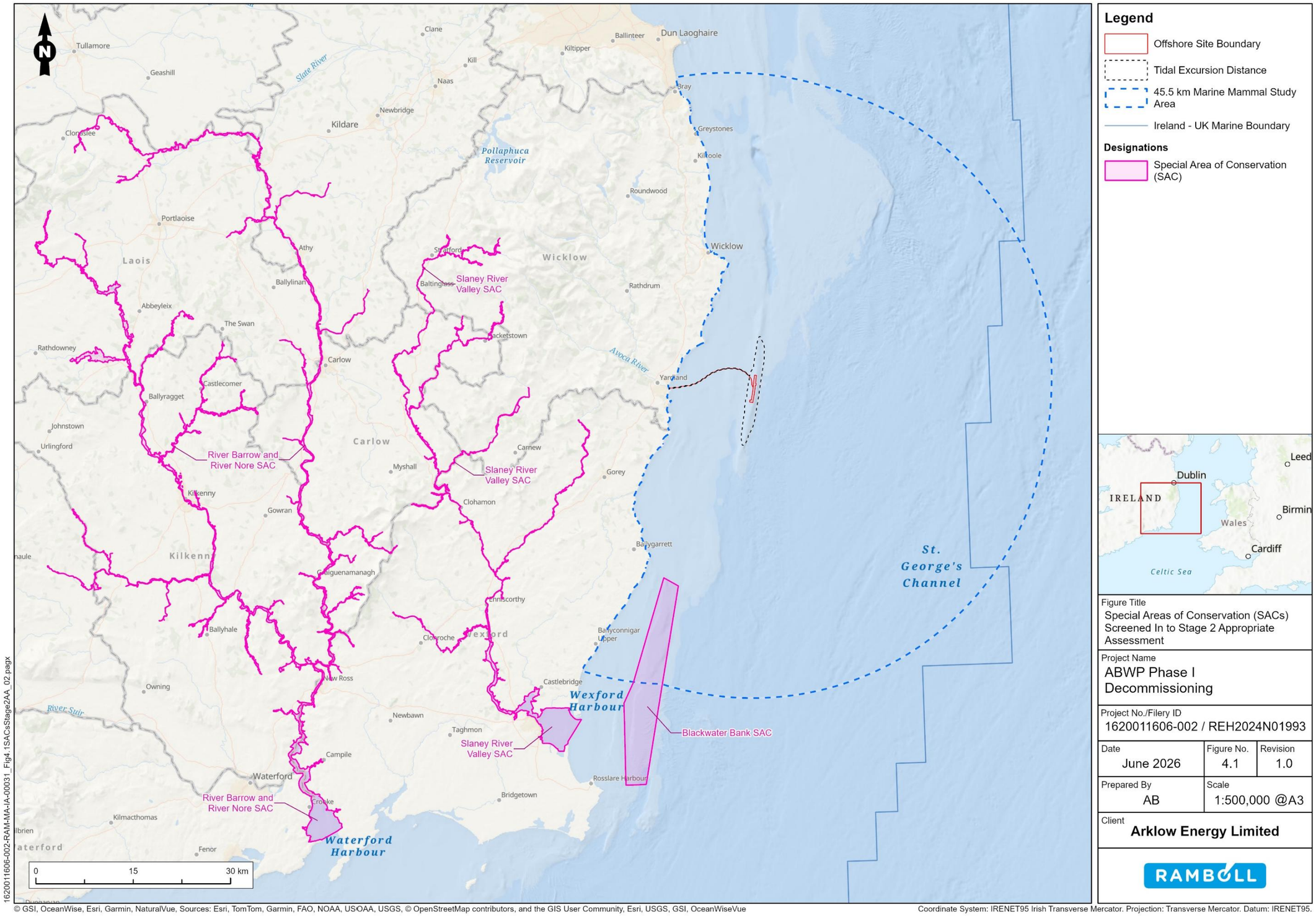

Figure 4.1: SACs screened into Stage 2 Appropriate Assessment

5 STAGE 2 APPROPRIATE ASSESSMENT

5.1.1.1 This section sets out the AA for each European Site for which likely significant effects could not be excluded during Stage 1 AA Screening stage (see the **AA Screening Report** prepared in support of the application for planning permission of the Proposed Works). The assessment has considered:

- Baseline information provided in **Volume 2, Chapter 5: Marine Biodiversity** of the EIAR;
- Modelling results presented in **Volume 3, Appendix 4.2: Sediment Plume Modelling Report** of the EIAR and **Volume 3, Appendix: 5.2 Underwater Sound Modelling Report** of the EIAR.

5.1.1.2 A total of 27 other plans and projects were considered in the Stage 1 AA Screening Report. However, no other plans and projects were identified which could act in-combination with the Proposed Works Offshore to give rise to adverse effects on the integrity of any European Site. Therefore, impact pathways in-combination with other plans or projects have not been considered further, and each potential impact pathway has been considered in relation to Proposed Works Offshore alone.

5.2 Slaney River Valley SAC

5.2.1 Overview of SAC

5.2.1.1 The Slaney River Valley SAC comprises the freshwater stretches and tributaries of the River Slaney and its estuary at Wexford Harbour, located 13.9 km west of the Offshore Site over land. However, the estuary mouth of the River Slaney is 55 km south west of the Offshore Site.

5.2.1.2 The Slaney River Valley SAC is designated for a variety of marine and freshwater habitats and species including harbour seal (which are known to haul-out in the estuary at Wexford Harbour) and several migratory fish species: sea lamprey, river lamprey, twaite shad and Atlantic salmon. The River Slaney is an important spawning river, particularly for Atlantic salmon.

5.2.1.3 A population of approximately 27 harbour seal use several sandbanks in Wexford Harbour for breeding, resting and moulting throughout the year (National Parks and Wildlife Service (NPWS), 2015).

5.2.1.4 The Stage 1 AA Screening Report identified the Proposed Works Offshore to have the potential for likely significant effects on migratory fish (from increased SSC and associated deposition and injury and/or disturbance from underwater noise) and harbour seal (from injury and/or disturbance from underwater noise). The COs for these qualifying features are provided in **Table 5.1**. The other qualifying features of the Slaney River Valley SAC were screened out in the Stage 1 **AA Screening Report**.

Table 5.1: Conservation objectives for Slaney River Valley SAC

Qualifying features	Conservation Objective: To maintain the favourable conservation condition of (qualifying interest) in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:	
	Attribute	**Target**
Sea lamprey	Distribution	Access to all water courses down to first order streams
	Population structure of juveniles	At least three age/size groups of sea lamprey present
	Juvenile density in fine sediment	Mean catchment juvenile density of sea lamprey at least 2/m²
	Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds
	Availability of juvenile habitat	More than 50% of sample sites positive

Qualifying features	Conservation Objective: To maintain the favourable conservation condition of (qualifying interest) in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:	
	Attribute	**Target**
River lamprey	Distribution: Extent of anadromy	Greater than 75% of main stem and major tributaries down to second order accessible from estuary
	Population structure of juveniles	At least three age/size groups of river lamprey present
	Juvenile density in fine sediment	Mean catchment juvenile density of river lamprey at least 2/m²
	Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds
	Availability of juvenile habitat	More than 50% of sample sites positive
Twaite shad	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
	Extend and distribution of spawning habitat	No decline in extent and distribution of spawning habitats
	Water quality - oxygen levels	No lower than 5mg/l
	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
Atlantic salmon	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 min 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
	Water quality	At least Q4 at all sites sampled by the Environmental Protection Agency (EPA)
Harbour seal	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.
	Disturbance	Human activities should occur at levels that do not adversely affect the harbour seal population at the site.

5.2.2 Increased SSC and Associated Deposition

Migratory Fish

5.2.2.1 Increased SSC and associated deposition could impair fish migration through behavioural responses, clogging of gills, physical stress and reduced survival rates.

5.2.2.2 During the Proposed Works Offshore, the main activity expected to result in increased SSC and deposition is potential dredging and the disposal of dredged material within the Sub Lease Area to allow safe access to the WTGs to facilitate the decommissioning of the WTGs and TPs/MPs

(should this be required). The removal of the export cable using a running method may also result in some increased SSC and deposition.

5.2.2.3 Sediment plume modelling provided in **Volume 3, Appendix 4.2: Coastal Processes Modelling Report** of the EIAR indicates that the worst-case maximum extent that sediment is expected to disperse during the Proposed Works Offshore varies between the offshore export cable route and the Sub Lease Area. Along the offshore export cable route, the only activity expected to disturb sediment is the offshore export cable removal works. Sediment dispersion during these is expected to be a maximum of 48 m from the Proposed Works Offshore over a total duration of 24 seconds due to the low volume of sediment expected to be disturbed.

5.2.2.4 In the Sub Lease Area, a larger volume of sediment may be disturbed during potential dredging activities if these are required, which would be expected to deposit a maximum of 7 km from the dredging works. The sediment present in the Sub Lease Area predominantly comprises sand. Coarse sand and gravel (grain size of 0.6-0.4 mm) are likely to deposit on the seabed immediately and adjacent to the area of disturbance, with less coarse sand (grain size of 0.064-0.590 mm) travelling a maximum distance of 48 m and depositing within 23.81 seconds of the disturbance. Finer sediment such as clay and mud (grain size of 0.001-0.0063 mm) is expected to disperse over a distance of 2 km and deposit within approximately 16 minutes. Small amounts of fines such as clay and silt are predicted to travel the maximum 7 km from the area of disturbance, depositing over a few days and resulting in a negligible increase of SSC and low concentration of suspended sediment. For the majority of the Sub Lease Area, the maximum deposition thickness is 0.010 - 0.050 m, apart from isolated pockets around dredge release area where maximum deposition thickness is 0.050 - 0.080 m (**Volume 3, Appendix 4.2** of the EIAR).

5.2.2.5 The majority of increased SSC as a result of the Proposed Works Offshore is expected to occur in concentrations of approximately 30 mg/L (with the exception of small, isolated pockets around dredge release locations where SSC could reach 2000 mg/L). Due to the highly temporary and short-term nature of the Proposed Works Offshore which will produce increased SSC, naturally occurring sediment redistribution, and settling times of 23.81 seconds for coarse sand, 16 minutes for clay and mud and a couple of days for fines, concentrations are expected to return to levels in line with background concentrations of SSC with a maximum of a few days.

5.2.2.6 The Sub Lease Area is largely sand/gravel with only 1% of fine sediment recorded (**Volume 3, Chapter 4** of the EIAR). Therefore, the majority (around 99%) of sediment dispersed from the Sub Lease Area is expected to be redeposited within a short distance of the Sub Lease Area. Therefore, the sediment plume created by Proposed Works Offshore is not anticipated to reach the Slaney River Valley SAC (55 km from the Offshore Site) or affect migration of qualifying fish species within the SAC and surrounding waters. It is possible that qualifying fish migrating from or to the Slaney River Valley SAC could encounter the sediment plume during migratory routes. However, as these species are often found in estuarine environments where SSC are naturally elevated due to tidal currents, these effects are considered to be negligible, of short duration and are not anticipated to result in barriers to migration, given that the increase in SSC from dredging will be minimal. Furthermore, the very short-term duration of the sediment plume and highly localised effects of sediment deposition suggests that interference with migratory routes is highly unlikely.

5.2.2.7 It is therefore concluded that there will be **no adverse effect on the integrity of migratory fish of the Slaney River Valley SAC** as a result of increased SSC and associated deposition during the Proposed Works Offshore.

5.2.3 Injury and/or Disturbance from Underwater Noise

Migratory Fish

5.2.3.1 Fish, including migratory fish, rely on underwater noise for a variety of functions including locating prey and predators, and communication (Fay and Popper, 2000). Underwater sound can

potentially have a negative impact on fish ranging from behavioural impacts to physical injury or mortality. In general, physical injury in fish (e.g. barotrauma) is primarily associated with exposure to a high intensity sound even if the sound is of short duration. In contrast, longer-duration or non-impulsive sound exposures are more likely to result in auditory effects, which are related to the sound source level and duration of exposure. While cumulative sound exposure is important, most fish are able to move away and avoid long-term sound exposure. Fish are also considered to be sensitive to the particle motion element of underwater sound; an impact considered more important than sound pressure for many species. However, research into this impact on fish populations is scarce, representing a source of uncertainty in the assessment process.

5.2.3.2 The effects of underwater sound in fish are described by Popper *et al*. (2014):

- **Behavioural effects**: substantial change in behaviour for the animals exposed to a sound. This may include long-term changes in behaviour and distribution, such as moving from preferred sites for feeding and reproduction, or alteration of migration patterns. This behavioural criterion does not include effects on single animals, or where animals become habituated to the stimulus, or small changes in behaviour such as a startle response or small movements;
- **Masking**: impairment of hearing sensitivity by greater than 6 dB, including all components of the auditory scene, in the presence of sound;
- **Temporary threshold shift (TTS)**: short term changes in hearing sensitivity may, or may not, reduce fitness and survival;
- **Recoverable injury**: tissue injuries including hair cell damage, minor internal or external hematoma etc., which are not likely to result in mortality; and
- **Mortality and potential mortal injury**: either immediate mortality or delayed mortality due to tissue and / or damage, such as barotrauma, that is sufficiently severe that death occurs sometime later due to decreased fitness.

5.2.3.3 Sensitivity between fish species varies depending on the frequency range that can be detected. Fish have been categorised according to their underwater noise sensitivity into functional hearing groups of high hearing sensitivity, medium hearing sensitivity and low hearing sensitivity by Popper and Hawkins (2019), all of which include migratory fish species which are present in the Slaney River Valley SAC (**Table 5.2**)

Table 5.2: Sensitivity of qualifying migratory fish features of the Slaney River Valley SAC

Hearing sensitivity	Description	Relevant qualifying features of the SAC
Group 1 – low hearing sensitivity	Lack a swim bladder or other gas chamber. They detect only particle motion and are less prone to barotrauma	Lamprey species
Group 2 – medium hearing sensitivity	Includes fish with swim bladders that do not aid in hearing. These species can detect particle motion but not sound pressure, and while still susceptible to barotrauma, they are sensitive to a narrower frequency range	Atlantic salmon
Group 3 – high hearing sensitivity	This group use a swim bladder or other gas volume to detect sound, perceiving both sound pressure and particle motion. These fish are vulnerable to barotrauma and sensitive to a broad frequency range (several kHz).	Twaite shad

5.2.3.4 Thresholds for TTS, recoverable injury and mortal injury for the functional hearing groups provided by Popper *et al*. (2014) for impulsive and non-impulsive sound sources are provided in **Volume 3, Appendix: 5.2 Underwater Sound Modelling** of the EIAR and the AA Screening Report (prepared in support of the application for planning permission of the Proposed Works).

5.2.3.5 Underwater noise modelling provided in **Volume 3, Appendix 5.2** of the EIAR has assessed the potential for Proposed Works Offshore activities to result in underwater noise effects to migratory fish species from both impulsive and non-impulsive sound sources, using criteria developed by Popper *et al*. (2014) and behaviour response considerations from Hawkins *et al.* (2014). The only impulsive noise source associated with the Proposed Works Offshore that are within fish hearing range (<1 kHz) are SBP activities associated with pre-decommissioning surveys. Non-impulsive noise sources within fish hearing range are support vessels, dredging, dynamic positioning, jet lancing, underwater mechanical cutting, vibratory extraction tools and vessel noise from the JUB.

5.2.3.6 Underwater noise modelling provided in **Volume 3**, **Appendix 5.2** of the EIAR indicates that for all non-impulsive sound sources associated with the Proposed Works Offshore, the potential impact range for injury and disturbance for all fish hearing groups for both stationary and mobile migratory fish are highly localised, within 10 m of the source. Mortality and potential mortal injury of eggs and larvae is also predicted to be restricted to within 10 m of the source.

5.2.3.7 For impulsive noise sources, disturbance impact ranges were only modelled for Group 2 and 3 fish as these are the only groups for which quantitative threshold criteria are available. For SBP activities, the disturbance impact range for both Group 2 and Group 3 fish is localised to within 10 m of the source (**Volume 3**, **Appendix 5.2** of the EIAR).

5.2.3.8 Therefore, any effects to migratory fish from underwater sound production are not expected to occur within the Slaney River Valley SAC, the estuary for which is 55 km south of the Proposed Works Offshore. Fish migrating from the Slaney River Valley SAC into the Irish Sea may pass close to the Offshore Site during underwater sound generation. However, it is considered highly unlikely that migratory fish will be within 10 m of either impulsive and non-impulsive sound sources due to presence of vessels and equipment operating in the Offshore Site, particularly as the use of SBP will be short-term and transient in nature. Therefore, underwater noise generation during the Proposed Works Offshore is highly unlikely to result in a barrier to fish migration for qualifying features of the Slaney River Valley SAC due to the small area of the Offshore Site which would be affected by underwater noise generation.

5.2.3.9 It is therefore concluded that there will be **no adverse effect on the integrity of migratory fish of the Slaney River Valley SAC** as a result of injury and/or disturbance from underwater noise during the Proposed Works Offshore.

Marine Mammals

5.2.3.10 Marine mammals are highly reliant on underwater sound for a number of ecological functions. Exposure to underwater noise, depending on intensity, duration and frequency of the sound source, can result in several effects for marine mammals:

- **Auditory injury (AUD INJ)** – includes, but not limited to, a permanent threshold shift (PTS), which is a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level resulting in auditory injury, most commonly the result of exposure to intense and / or long-term noise;
- **TTS** – a recoverable and reversible increase in the threshold of audibility, resulting from long-term exposure to noise but not at the extent at which auditory injury would occur;
- **Behavioural responses** – includes increased alertness, temporary avoidance of habitat, changes in foraging patterns and / or interruption of social interaction. Behavioural responses can be highly variable; and
- **Masking** – where anthropogenic underwater sound partially or entirely reduces the audibility of signals used for communication and prey detection.

5.2.3.11 Underwater sound effects to marine mammals depend on the nature of the sound source (impulsive or non-impulsive), the frequency of the sound source, and the sound source level which can be referred to as the intensity of the sound. Impulsive sound sources for the Proposed

Works offshore are SBP and USBL activities associated with the pre-decommissioning surveys, while non-impulsive sounds include vessel engine noise, and activities such as dredging, dynamic positioning, mechanical cutting, and jet lancing.

5.2.3.12 The frequency of the sound source is important as some activities can generate sounds that occur outside the hearing range of a marine mammal. Where activities generating underwater sound operate at a frequency that is within the hearing range of a species of interest, the intensity and duration of the sound source will be key determinants of the potential impacts to individual animals.

5.2.3.13 The most up-to-date sound exposure criteria for auditory injury in marine mammals have been published by the United States National Marine Fisheries Service (NMFS) (NMFS, 2024). For impulsive sounds, thresholds for auditory injury are based on dual metrics of peak sound pressure level (SPLpeak) and M-weighted cumulative sound exposure level (SELcum). For non-impulsive sounds, thresholds are provided for SELcum only.

5.2.3.14 The hearing range and sound thresholds for phocid seals in water which includes harbour seal (the relevant qualifying feature of the Slaney River Valley SAC is designated) are provided in **Table 5.3**.

Table 5.3: Hearing range and sound thresholds for phocid seals in water

Species group	Generalised hearing range	Impulsive sound				Non-impulsive sound	
		SPL_{peak}		SPL_{cum}		SEL_{cum}	
		PTS	TTS	PTS	TTS	PTS	TTS
Phocid seals in water such as harbour seal	40 Hz – 90 kHz*	223	217	183	168	195	175

*Updated NMFS (2024) gives a revised hearing range for seals in water of 40 Hz to 90 kHz, updated from hearing ranges provided by Southall *et al*. (2019)
NB. Units for SPL are dB re. 1µPa and units for SEL are dB re. 1µPa2s.

5.2.3.15 There are no widely agreed quantitative thresholds for behavioural disturbance (Southall *et al*., 2019; NMFS, 2024), reflecting a high variability in behavioural responses between both species and individuals (Gomez *et al*., 2016). A lack of dose-related responses reflects the context of exposure, including factors such as movement and depth of the sound source, the ratio of signal to background noise, as well as the species, sex, age, reproductive state, behavioural state prior to sound exposure, prior experience, motivation, and behavioural conditioning (Gomez *et al*., 2016).

5.2.3.16 Underwater noise modelling provided in **Volume 3, Appendix 5.2** of the EIAR indicates that for all non-impulsive sources and SBP activities, potential AUD INJ and TTS impact ranges for seals in water are highly localised with impacts confined to less than 10 m from the sound source. The use of the USBL associated with the pre-decommissioning surveys has an impact range for seals of 40 m and 100 m, for AUD INJ and TTS respectively. The Slaney River Valley SAC estuary where seals enter and exit the SAC is located 55 km south of the Offshore Site and therefore AUD INJ and TTS impacts to harbour seal will not occur within the marine boundary of the Slaney River Valley SAC.

5.2.3.17 Harbour seal is a highly mobile species and have been observed travelling up to 273 km from their haul-out sites during foraging trips (Carter *et al*., 2022). Therefore, there is potential for individuals from the Slaney River Valley SAC to be within range of the Offshore Site for AUD INJ and/or TTS to occur, particularly while the USBL is utilised to support the pre-decommissioning surveys. However, at-sea usage and telemetry data in the Irish Sea (Carter *et al*., 2022; Russell *et al*., 2017) shows that presence of harbour seal during foraging trips in the Offshore Site is low, with hotspots located around haul-out sites such as Wexford Harbour (55 km south) and Lambay Island near Dublin (72 km north). Considering the low usage of waters by harbour seal in and around the Offshore Site and the very short-term nature of the geophysical surveys (10 days), harbour seal from the Slaney River Valley SAC potentially present within the range for

AUD INJ and/or TTS during foraging trips is expected to be limited to very few individuals, if any at all. Additionally, for impulsive sources such as USBL and SBP, marine mammals are expected to move away from sudden and intense underwater sound sources, limiting accumulated exposure.

5.2.3.18 The impact range for behavioural disturbance in seals is greatest for the vibratory extraction tool, with impacts predicted up to 45.5 km from the sound source. Behavioural disturbance was also predicted to 32 km for dredging, 14 km for dynamic positioning, 13 to14 km for jet lancing and underwater mechanical cutting, and 6.5 km for support vessels and vessel noise from the JUB.

5.2.3.19 The area of the Slaney River Valley SAC where harbour seals enter and exit the river is 55 km south and therefore behavioural disturbance from underwater noise will not occur to seals within the marine boundary of the SAC. It is possible that harbour seals from the Slaney River Valley SAC may be exposed to behavioural disturbance effects during foraging trips. However, harbour seals are considered to use waters within 25 km of their haul-out sites more than the Offshore Site and surrounding waters (Cunningham *et al*., 2009, Carter *et al*., 2022; Russell *et al*., 2017). Furthermore, the distances for the impact range of behavioural disturbance are based on the National Oceanic and Atmospheric Administration (NOAA) 2005 threshold of 120 dB SPLrms and there is a considerable degree of uncertainty and variability in the onset of disturbance and therefore any disturbance ranges should be treated as potentially over precautionary. Another important consideration is that the majority of the noise produced by the Proposed Works Offshore will be either temporary or transitory, as opposed to permanent and fixed, which is what the underwater sound modelling assumes, and therefore its findings are considered conservative. For the USBL, which is an impulsive sound source, behavioural disturbance was predicted to 200 m (**Volume 3, Appendix 5.2: Underwater Sound Modelling Report** of the EIAR).

5.2.3.20 Consequently, due to the short term and temporary duration of underwater noise generating activities associated with the Proposed Works Offshore, and low usage of the Offshore Site (Carter *et al*., 2022; Russell *et al*., 2017) and surrounding waters by harbour seals, any behavioural disturbance is expected to be minor.

5.2.3.21 Furthermore, additional mitigation is proposed to further minimise any potential effects, and during all works associated with the Proposed Works Offshore, including geophysical surveys and decommissioning activities, a qualified Marine Mammal Observer (MMOb) will be present in line with NPWS (2014) and JNCC (2025) guidance for minimising underwater noise effects to marine mammals (see **Volume 3, Appendix 3.5: Marine Mammal Mitigation Protocol** of the EIAR). During the noise generating activities, a 500 m observation zone around the sound source/vessel will be employed. Within this observation zone, the MMOb will ensure the area is clear of marine mammals prior to commencing the relevant activity.

5.2.3.22 As such, the limited number of individuals and additional mitigation protocol together with the largely temporary and transitory nature of the noise sources further reduces the likelihood of behavioural disturbance to harbour porpoise.

5.2.3.23 It is therefore concluded that there will be **no adverse effect on the integrity of harbour seal of the Slaney River Valley SAC** as a result of injury and/or disturbance from underwater noise during the Proposed Works Offshore.

5.3 Blackwater Bank SAC

5.3.1 Overview of SAC

5.3.1.1 The Blackwater Bank SAC is located approximately 2 km off the coast of County Wexford in southeastern Ireland, 29.2 km south of the Proposed Works Offshore. The Blackwater Bank SAC is designated for harbour porpoise. A considerable number of harbour porpoise are known to gather within the Blackwater Bank SAC, the total population size of harbour porpoise using the

habitat is not fully understood (Department of Housing, Local Government and Heritage, 2024a). During the summer of 2022, the density of individuals from SCANS-IV Irish Sea survey block (Block CS-D) was estimated as 0.2803 animals per km^2 (Gilles *et al*., 2023). Furthermore, digital aerial scan surveys between 2023 – 2025 found mean harbour porpoise densities to be between 0.038 - 0.07 animals per km^2 within the AWBP Phase II Study Area (APEM, 2026b). There is currently no detailed data on individual or group movements by harbour porpoise within or into/out of the SAC, and it is unknown if harbour porpoise exhibit site fidelity or residency to the site (NPWS, 2024).

5.3.1.2 The AA Screening Report (prepared in support of the application for planning permission of the Proposed Works)) identified the Proposed Works Offshore to have the potential for likely significant effects on harbour porpoise (injury and/or disturbance from underwater noise). The conservation objectives for harbour porpoise are provided in **Table 5.4**.

Table 5.4: Conservation objectives for Blackwater Bank SAC

Qualifying features	Conservation Objective: To maintain the favourable conservation condition of (qualifying interest) in the Blackwater Bank SAC, which is defined by the following list of attributes and targets:	
	Attribute	**Target**
Harbour porpoise	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.

5.3.2 Injury and/or Disturbance from Underwater Noise

Marine Mammals

5.3.2.1 Marine mammals are highly reliant on underwater sound for a number of ecological functions. As described in **Section 5.2**, exposure to underwater noise, depending on intensity, duration and frequency of the sound source, can result in effects including AUD INJ, TTS, behavioural responses and masking.

5.3.2.2 Underwater sound effects to marine mammals depend on the nature of the sound source (impulsive or non-impulsive), the frequency of the sound source, and the sound source level which can be referred to as the intensity of the sound. Impulsive sound sources for the Proposed Works offshore are SBP and USBL activities, while non-impulsive sounds include vessel engine noise, and activities such as dredging, dynamic positioning, mechanical cutting, and jet lancing.

5.3.2.3 The frequency of the sound source is important as some activities can generate sounds that occur outside the hearing range of a marine mammal. Where activities generating underwater sound operate at a frequency that is within the hearing range of a species of interest, the intensity and duration of the sound source will be key determinants of the potential impacts to individual animals.

5.3.2.4 Harbour porpoise, for which the Blackwater Bank SAC is designated, are classified as very high frequency (VHF) cetaceans, as their hearing is specialised for detecting and producing high-frequency sounds, particularly for echolocation. The hearing range and sound thresholds for harbour porpoise are provided in **Table 5.5**.

Table 5.5: Sound exposure criteria for auditory injury in very high frequency cetaceans, using criteria provided in NMFS (2024) (see Volume 3, Appendix: 5.2 Underwater Sound Modelling Report of the EIAR)

Species group	Generalised hearing range	Impulsive sound		Non-impulsive sound
		SPL_{peak}	SPL_{cum}	SEL_{cum}

		PTS	TTS	PTS	TTS	PTS	TTS
Very high frequency cetaceans (Harbour porpoise)	200 Hz – 165 kHz*	202	196	159	144	181	161

5.3.2.5 Underwater noise modelling for VHF cetaceans is reported in **Volume 3, Appendix: 5.2** of the EIAR-

5.3.2.6 For all non-impulsive noise sources and SBP activities, potential AUD INJ and TTS impact ranges for VHF cetaceans are highly localised, with impacts confined to less than 10 m from the sound source. The only activity associated with the Proposed Works Offshore that has potential for effects beyond the immediate vicinity of the noise source is the USBL, which has impact ranges of 400 m and 900 m from the sound source, for AUD INJ and TTS, respectively. Therefore, due to the distance from the Blackwater Bank SAC (29.2 km) from the Proposed Works Offshore, AUD INJ and TTS impacts to harbour porpoise will not occur within the boundary of the SAC.

5.3.2.7 Although a few individuals may travel close to the Proposed Works Offshore, it is considered highly unlikely that individuals will be present within the immediate vicinity (<10 m) of the sound source. For USBL activities, while AUD INJ and TTS impacts extend up to 900 m from the sound source, it is still anticipated that few individuals will be present during the works considering the short-term nature of the geophysical surveys (10 days). Additionally, for impulsive sources such as USBL, marine mammals are expected to move away from sudden and intense underwater sound sources, limiting accumulated exposure.

5.3.2.8 The impact range for behavioural disturbance is greatest for the vibratory extraction tool, with impacts predicted up to 45.5 km from the sound source. Behavioural disturbance was also predicted to 32 km for dredging, 14 km for dynamic positioning, 13 to 14 km for jet lancing and underwater mechanical cutting, and 6.5 km for support vessels and vessel noise from the JUB.

5.3.2.9 Behavioural disturbance to harbour porpoise is therefore only considered possible for the vibratory extraction tool and dredging activities, as Blackwater Bank SAC is located 29.2 km from the Proposed Works Offshore. However, the Blackwater Bank SAC is a total of 124.7 km^2 and therefore approximately half of the SAC could be affected by behavioural disturbance (see **Figure 4.1**). The use of vibratory extraction and dredging is also temporary, with a maximum duration of approximately 66.5 days (9.5 days per monopile) and 43 days, respectively (during which time underwater sound generation will be intermittent). Furthermore, while behavioural responses are possible within the SAC boundary, any behavioural effects are expected to be limited to a small number of individuals and temporary in nature.

5.3.2.10 Furthermore, the distances for the impact range of behavioural disturbance are based on the NOAA 2005 threshold of 120 dB SPLrms and there is a considerable degree of uncertainty and variability in the onset of disturbance and therefore any disturbance ranges should be treated as potentially over precautionary. This sound source level of 120 dB SPLrms is also below the level of ambient underwater sound typically experienced in offshore areas (Farcas *et al*., 2020). Another important consideration is that the majority of the noise produced by the Proposed Works Offshore will be either temporary or transitory, as opposed to permanent and fixed.

5.3.2.11 Additional mitigation is proposed to further minimise any potential effects, and a qualified Marine Mammal Observer (MMOb) will be present for all works associated with the Proposed Works Offshore, including geophysical surveys and decommissioning activities (see **Volume 3, Appendix 3.5** of the EIAR). During the activities associated with the Proposed Works Offshore, a 500 m observation zone around the sound source/vessel will be employed. Within this observation zone, the MMOb will ensure the area is clear of marine mammals prior to commencing the relevant activity. As such, the limited number of individuals and embedded mitigation protocol together with the largely temporary and transitory nature of the noise sources further reduces the likelihood of behavioural disturbance to harbour porpoise.

5.3.2.12 It is therefore concluded that there will be **no adverse effect on the integrity of harbour porpoise of the Blackwater Bank SAC** as a result of injury and/or disturbance from underwater noise during the Proposed Works Offshore.

5.4 River Barrow and River Nore SAC

5.4.1 Overview of SAC

5.4.1.1 The River Barrow and River Nore SAC comprises the freshwater stretches of the Barrow and Nore River, tidal elements of the river and the estuary located in Waterford, located 48.4 km from the Proposed Works Offshore. This SAC is designated for several marine and freshwater species including migratory fish species sea lamprey, river lamprey, twaite shad and Atlantic salmon. The river provides one of a small number of spawning grounds for twaite shad in Ireland and is also a designated salmonid river (Department of Housing, Local Government and Heritage, 2024).

5.4.1.2 The AA Screening Report (prepared in support of the application for planning permission of the Proposed Works)) identified the Proposed Works Offshore to have the potential for likely significant effects on migratory fish from increased SSC and associated deposition and injury and/or disturbance from underwater noise. The conservation objectives for these qualifying features are provided in **Table 5.6**.

Table 5.6: Conservation objectives for River Barrow and River Nore SAC

Qualifying features	Conservation Objective: To maintain the favourable conservation condition of (qualifying interest) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:	
	Attribute	**Target**
Sea lamprey	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 of sea lamprey 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
	Availability of juvenile habitat	More than 50% of sample sites positive
River lamprey	Distribution: Extent of anadromy	Greater than 75% of main stem and major tributaries down to second order accessible from estuary
	Population structure of juveniles	At least three age/size groups of river lamprey present
	Juvenile density in fine sediment	Mean catchment juvenile density of river lamprey at least 2/m²
	Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds
	Availability of juvenile habitat	More than 50% of sample sites positive
Twaite shad	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
	Extend and distribution of spawning habitat	No decline in extent and distribution of spawning habitats
	Water quality: Oxygen levels	No lower than 5 mg/l
	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
Atlantic salmon	Distribution: Extent of anadromy	100% of river channels down to second order accessible from estuary

Qualifying features	Conservation Objective: To maintain the favourable conservation condition of (qualifying interest) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:	
	Attribute	**Target**
	Adult spawning fish	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 min 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
	Water quality	At least Q4 at all sites sampled by EPA

5.4.2 Increased SSC and associated deposition

Migratory Fish

5.4.2.1 Increased SSC and associated deposition could impair fish migration through behavioural responses, clogging of gills, physical stress and reduced survival rates.

5.4.2.2 During the Proposed Works Offshore, the main activity expected to result in increased SSC and deposition is dredging and the disposal of dredged material within the Sub Lease Area to allow safe access to the WTGs to facilitate the decommissioning of the WTGs and TPs/MPs. The removal of the export cable using a running method may also result in some increased SSC and deposition.

5.4.2.3 However, sediment plume modelling provided in **Volume 3, Appendix 4.2** of the EIAR indicates that the worst-case maximum extent that sediment is expected to disperse during the Proposed Works Offshore is 48 m for export cable works (over a total duration of 24 seconds) and a maximum of 7 km for dredging works in the Sub Lease Area. However, the majority of sediment is expected to deposit within a short distance of the Sub Lease Area, within 2 km over a very short time period.

5.4.2.4 Therefore, the sediment plume created by Proposed Works Offshore is not anticipated to reach the River Barrow and River Nore SAC (48.4 km south of the Offshore Site) or affect migration of qualifying fish species within the SAC and surrounding waters. It is possible that qualifying fish migrating from or to the River Barrow and River Nore SAC could encounter the sediment plume during migratory routes. However, as these species are often found in estuarine environments where SSC are naturally elevated due to tidal currents, effects are considered to be negligible and are not anticipated to result in barriers to migration. Furthermore, the very short-term duration of the sediment plume and highly localised effects of sediment deposition suggests that interference with migratory routes is highly unlikely.

5.4.2.5 It is therefore concluded that there will be **no adverse effect on the integrity of River Nore and River Barrow SAC** as a result of increased SSC and associated deposition during the Proposed Works Offshore.

5.4.3 Injury and/or Disturbance from Underwater Noise

Migratory Fish

5.4.3.1 Fish, including migratory fish, rely on underwater noise for a variety of functions including locating prey and predators, and communication (Fay and Popper, 2000). Underwater sound can potentially have a negative impact on fish ranging from behavioural impacts to physical injury or mortality, with physical injury in fish (e.g. barotrauma) primarily associated with exposure to a high intensity sound even if the sound is of short duration.

5.4.3.2 The effects of underwater sound in fish (as described by Popper *et al*., 2014) and the sensitivity of different fish hearing groups (Popper and Hawkins, 2019) for qualifying migratory fish features of the River Barrow and River Nore SAC are provided in **Section 5.2** and **Table 5.2**.

5.4.3.3 Underwater noise modelling provided in **Volume 3, Appendix 5.2** of the EIAR has assessed the potential for Proposed Works Offshore activities to result in underwater noise effects to migratory fish species from both impulsive and non-impulsive sound sources, using criteria developed by Popper *et al*. (2014) and behaviour response considerations from Hawkins *et al.* (2014). The only impulsive noise source associated with the Proposed Works Offshore that are within fish hearing range (<1 kHz) are SBP activities. Non-impulsive noise sources within fish hearing range are support vessels, dredging, dynamic positioning, jet lancing, underwater mechanical cutting, vibratory extraction tools and vessel noise from the JUB.

5.4.3.4 Underwater noise modelling provided in **Volume 3, Appendix 5.2: Underwater Sound Modelling Report** of the EIAR indicates that for all non-impulsive sound sources associated with the Proposed Works Offshore, the potential impact range for all fish hearing groups for both stationary and mobile migratory fish are highly localised, within 10 m of the source. Mortality and potential mortal injury of eggs and larvae is also predicted to be restricted to within 10 m.

5.4.3.5 For impulsive noise sources, disturbance impact ranges were only modelled for Group 2 and 3 fish as these are the only groups for which quantitative threshold criteria are available. For SBP activities, the disturbance impact range for both Group 2 and Group 3 fish is localised to within 10 m of the source (**Volume 3**, **Appendix 5.2: Underwater Sound Modelling Report** of the EIAR).

5.4.3.6 Therefore, due to the distance of the River Barrow and River Nore SAC (48.4 km) from the Proposed Works Offshore, any underwater noise effects resulting from the use of SBP and non-impulsive sound sources will not occur within the boundary of the SAC. Although there is the potential for migratory fish to pass close to the Proposed Works Offshore during the use of migratory routes in the Irish Sea, it is considered highly unlikely that migratory fish would be present within 10 m of the sound sources due to the presence of vessels and other activity in the Offshore Site that is likely to cause migratory fish to choose alternative routes. Due to the very small area of the Offshore Site which would be affected by underwater noise generation, the Proposed Works Offshore are therefore not expected to result in a barrier to fish migration for qualifying features of the River Nore and River Barrow SAC.

5.4.3.7 It is therefore concluded that there will be **no adverse effect on the integrity of migratory fish qualifying features of the River Barrow and River Nore SAC** as a result of injury and/or disturbance from underwater noise during the Proposed Works Offshore.

6 CONCLUSION

6.1.1.1 The **AA Screening Report** (prepared in support of the application for planning permission of the Proposed Works) could not exclude the possibility of likely significant effects on three European Sites on a precautionary basis:

- Slaney River Valley SAC;
- River Barrow and River Nore SAC; and
- Blackwater Bank SAC.

6.1.1.2 It was concluded in the **AA Screening Report** that in-combination effects of the Proposed Works Offshore with any other plan or project was highly unlikely and therefore this was not considered further in this NIS.

6.1.1.3 The relevant potential impact pathways for the Proposed Works Offshore which could give rise to significant effects on these designated sites and their relevant qualifying features (and COs) have therefore been assessed in this NIS.

6.1.1.4 With the implementation of mitigation measures where required, it has been possible to conclude that no significant adverse effects on any European Site, relevant qualifying features and COs, as a result of the Proposed Works Offshore, are predicted, particularly given the large distances between the European sites and Proposed Works Offshore activities, and the temporally and spatially limited nature of potential impacts.

6.1.1.5 It is therefore concluded, **in view of the best scientific knowledge, that the Proposed Works Offshore will have no adverse effect on the integrity of any European Site with marine qualifying features and their COs.** Therefore, Stage 3 is not required.

7 REFERENCES

ABPmer, 2014. Wave and Tidal Further Leasing. HRA Principles Document, Screening Report and Appropriate Assessment Information Report. Crown Estate.

APEM, 2026a. Arklow Bank Wind Park 2 – Environmental Impact Assessment Report. Volume III, Appendix 10.1: Fish, Shellfish and Sea Turtle Ecology Technical Report. Available at: https://www.pleanala.ie (Accessed: May 2026).

APEM, 2026b. Arklow Bank Wind Park 2 – Environmental Impact Assessment Report. Volume II, Chapter 11: Marine Mammals (Revised March 2026). Available at: https://www.pleanala.ie (Accessed: May 2026).

Carter, M., Boehme, L., Cronin, M., Duck, C., Grecian, W., Hastie, G., . . . Russell, D., 2022. Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. Frontiers in Marine Science.

Corcoran, W., Gordon, P., McCarthy, E., Flynn, E., O Brian, M., Szocs, A., Robson, S., Piaskowy, J. and Kelly, F.L., 2025. Sampling Fish in Rivers 2024 – Avoca River Catchment, Factsheet No. 1. National Research Survey Programme. Inland Fisheries Ireland.

Coull, K. A., Johnstone, R. and Rogers, S.I, 1998. Fisheries Sensitivity Maps in British Waters. UKOOA Ltd.

Cronin., *et al*, 2006. Guidelines for the Assessment of Dredged material in Irish Waters. Available at: https://www.epa.ie (Accessed: May 2026)

Cronin., *et al*, 2019. Addendum to 2006 Guidelines for the Assessment of Dredged material in Irish Waters. Available at: https://www.epa.ie (Accessed: May 2026).

Cunningham, L., Baxter, J.M., Boyd, I.L., Duck, C.D., Lonergan, M., Moss, S.E. and McConnell, B., 2008. Harbour seal movements and haul-out patterns: implications for monitoring and management. Aquatic Conservation: Marine and Freshwater Ecosystems, 19, 398-407.

Department of Climate, Energy and the Environment, 2026. MarinePlan.ie.

Department of Housing, Local Government and Heritage, 2015. Slaney River Valley SAC – Site Synopsis. Available at: https://www.npws.ie (Accessed: May 2026).

Department of Housing, Local Government and Heritage, 2024a. Blackwater Bank SAC – Site Synopsis. Available at: https://www.npws.ie (Accessed: May 2026).

Department of Housing, Local Government and Heritage, 2024b. River Barrow and River Nore SAC – Site Synopsis. Available at: https://www.npws.ie (Accessed: March 2026).

Ellis, J., Milligan, S., Readdy, L., Taylor, N. and Brown, M., 2012. Spawning and nursery grounds of selected fish species in UK waters. Cefas.

Environmental Protection Agency (EPA), 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available at: https://www.epa.ie (Accessed: February 2026)

European Commission, 2021. Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Available at: https://op.europa.eu (Accessed: May 2026).

Evans, P.G.H. and Waggitt, J.J., 2023. Modelled Distribution and Abundance of Cetaceans and Seabirds in Wales and Surrounding Waters. NRW Evidence Report, Report No: 646, 354 pp. Natural Resources Wales, Bangor.

Farcas, A., Powell, C. F., Brookes, K. L., & Merchant, N. D. (2020). Validated shipping noise maps of the Northeast Atlantic. Science of the Total Environment, 735, 139509. doi: https://doi.org

Fay, R.R. and Popper, A.N., 2000. Evolution of hearing in vertebrates: the inner ears and processing. Hearing Research, 149, 1-10.

Fisheries Ireland, 2022. Fish in Rivers Factsheet. Available at: https://www.fisheriesireland.ie (Accessed: May 2026).

Gallagher, T., O'Gorman, N., Rooney, S.M., Brett, A. and O'Leary, C., 2023. National Programme: Habitats Directive and Red Data Book Species Summary Report 2022. Inland Fisheries Ireland, 3044 Lake Drive, Citywest, Dublin 24, Ireland.

Gilles, A., Authier, M., Ramirez-Martinez, N., Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., Fernández-Maldonado, C., Geelhoed, S.C.V. and Kyhn, L., 2023. Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys.

Giralt Paradell, O., Cañadas, A., Bennison, A., Todd, N., Jessopp, M. and Rogan, E., 2024. Aerial surveys of cetaceans and seabirds in Irish waters: Occurrence, distribution and abundance in 2021-2023. Department of the Environment, Climate & Communications and Department of Housing, Local Government & Heritage, Ireland. 260pp.

Gomez, C., Lawson, J., Wright, A.J., Buren, A., Tollit, D. and Lesage, V., 2016. A systematic review on the behavioural responses of wild marine mammals to noise: The disparity between science and policy. Canadian Journal of Zoology, 94(12), 801–819.

Hawkins, A.D., Roberts, L. and Cheesman, S., 2014. Responses of free-living coastal pelagic fish to impulsive sounds. The Journal of the Acoustical Society of America, 135(5), pp. 3101-3116.

HiDef Aerial Surveying Limited, 2020. 'Digital video aerial surveys of seabirds and marine mammals at Arklow Bank: Two-year survey report March 2018 - February 2020 survey programme (plus April 2020)', DOCUMENT NUMBER: HP00091-703-01.

Institute of Environmental Management and Assessment (IEMA), 2024. Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction. Available at: https://www.iema.net

International Maritime Organization (IMO), 2023. 2023 guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species. Available at: https://wwwcdn.imo.org (Accessed: April 2026).

IMO, 2024. International Convention for the Control and Management of Ships' Ballast Water and Sediment, 2004 (as amended). Available at: https://assets.publishing.service.gov.uk (Accessed: April 2026).

JNCC, 2025. DRAFT JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys. JNCC.

MacCabe Durney Barnes (MDB), 2017. Guidance on EIS and NIS preparation for Offshore Renewable Energy Projects. Prepared for the Department of Communications, Climate Action & Environment (DCCAE) and Sustainable Energy Authority of Ireland (SEAI). Available at: https://assets.gov.ie (Accessed: February 2026)

Morris, C.D. and Duck, C.D., 2019. Aerial thermal-imaging survey of seals in Ireland, 2017 to 2018. Irish Wildlife Manuals, No. 111 National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

NMFS, 2024. Update to: Technical Guidance for Assessing the 3 Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts. US Department of Commerce, NOAA.

NPWS, 2024. Blackwater Bank SAC (site code 002953) Conservation objectives supporting document - Harbour Porpoise V1. Conservation objectives supporting document series. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin, Ireland

NPWS, 2014. Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. Available at: https://www.npws.ie (Accessed: April 2026).

Office of the Planning Regulator, n.d. Planning Library. Environment and Climate Glossary. Available at: https://www.opr.ie (Accessed: June 2026)

Popper, A.N. and Hawkins, A.D., 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Journal of Fish Biology, 94, pp. 692–713.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., . . . Løkkeborg, S., 2014. Sound exposure guidelines. In ASA S3/SC1. 4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI, 33-51

RPS, 2021. Arklow Bank Wind Park, Phase 2. Marine Site Investigations. Natura Impact Statement. Comprising a Stage One screening appraisal for appropriate assessment, and a Stage Two appraisal for appropriate assessment.

Russell, D.J.F., Jones, E.L. and Morris, C.D., 2017. Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals. Scottish Marine and Freshwater Science Vol 8 No 25, 25pp. DOI: 10.7489/2027-1

Salmon Watch Ireland, 2025. Saving the Irish Salmon: A policy statement adopted by The Board of Salmon Watch Ireland. Available at: https://salmonwatchireland.ie (Accessed: May 2026).

Southall, B., Finneran, J.I., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., . . . Tyack, P., 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals, 45, 125-232.

Special Committee on Seals (SCOS), 2025. Scientific Advice on Matters Related to the Management of Seal Populations: 2025. Natural Environment Research Council, Special Committee on Seals. Available at: https://www.smru.st-andrews.ac.uk (Accessed: May 2026).

SSE Renewables, 2024. Arklow Bank Wind Park 2 – Environmental Impact Assessment Report. Volume II, Chapter 9: Benthic Subtidal and Intertidal Ecology. Available at: https://www.pleanala.ie (Accessed: March 2026).

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. and Felce, T., 2020. Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), pp.253-269.