



# ATTACHMENT 4.3 APPROPRIATE ASSESSMENT SCREENING REPORT

Oriel Wind Farm Project

Oriel Windfarm Limited



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## Contents

|            |                                                        |           |
|------------|--------------------------------------------------------|-----------|
| <b>1.0</b> | <b>Introduction .....</b>                              | <b>1</b>  |
| 1.1        | Project Background .....                               | 1         |
| 1.2        | Purpose of this Report .....                           | 3         |
| 1.3        | Statement of Authority .....                           | 3         |
| 1.4        | Legislation .....                                      | 3         |
| 1.4.1      | European Legislation .....                             | 3         |
| 1.4.2      | National Legislation .....                             | 4         |
| <b>2.0</b> | <b>Proposed Maritime Usage .....</b>                   | <b>6</b>  |
| 2.1.1      | Overview .....                                         | 6         |
| 2.1.2      | Estimated Project Schedule/ Programme .....            | 8         |
| 2.1.3      | Marine Geophysical Survey .....                        | 9         |
| 2.1.4      | Intertidal Geophysical Survey .....                    | 11        |
| 2.1.5      | Marine Geotechnical Surveys .....                      | 12        |
| 2.1.6      | Intertidal Geotechnical Survey .....                   | 14        |
| 2.1.7      | Environmental Surveys .....                            | 14        |
| 2.1.8      | Metocean Survey .....                                  | 15        |
| 2.1.9      | Survey Vessels .....                                   | 16        |
| 2.1.10     | General Requirements .....                             | 18        |
| <b>3.0</b> | <b>Methodology .....</b>                               | <b>21</b> |
| 3.1        | Appropriate Assessment Guidance .....                  | 21        |
| 3.2        | Stages of Appropriate Assessment .....                 | 21        |
| 3.3        | Stage 1 Screening / Test of Significance .....         | 23        |
| 3.4        | Desk Study .....                                       | 23        |
| 3.5        | Identification of Relevant European Sites .....        | 24        |
| 3.5.1      | Source-Pathway Receptor Model .....                    | 24        |
| 3.5.2      | Zone of Influence .....                                | 24        |
| <b>4.0</b> | <b>Desk Study .....</b>                                | <b>25</b> |
| 4.1        | Habitats .....                                         | 25        |
| 4.2        | Species .....                                          | 26        |
| 4.2.1      | Otter .....                                            | 26        |
| 4.2.2      | Marine Mammals .....                                   | 26        |
| 4.2.3      | Migratory Fish species .....                           | 29        |
| 4.2.4      | Birds .....                                            | 30        |
| <b>5.0</b> | <b>Identification of Relevant European Sites .....</b> | <b>33</b> |

|            |                                                                             |           |
|------------|-----------------------------------------------------------------------------|-----------|
| 5.1        | Assessment of Connectivity .....                                            | 33        |
| 5.2        | Source-Pathway-Receptor Assessment .....                                    | 33        |
| 5.2.1      | Sources of Impact .....                                                     | 33        |
| 5.2.2      | Impacts Scoped Out of Assessment .....                                      | 33        |
| 5.2.3      | Impacts Scoped in for Assessment .....                                      | 34        |
| 5.3        | Identification of relevant European sites .....                             | 34        |
| 5.3.1      | Annex I Habitats .....                                                      | 35        |
| 5.3.2      | Annex II Otter .....                                                        | 35        |
| 5.3.3      | Annex II Marine Mammals .....                                               | 36        |
| 5.3.4      | Annex II Migratory Fish .....                                               | 37        |
| 5.3.5      | Birds .....                                                                 | 37        |
| 5.4        | Conservation Objectives .....                                               | 48        |
| <b>6.0</b> | <b>Supporting Information for Screening for Appropriate Assessment.....</b> | <b>48</b> |
| 6.1        | Management of European Sites .....                                          | 48        |
| 6.2        | Assessment of Likely Significant Impacts .....                              | 48        |
| 6.2.1      | Annex II Otter .....                                                        | 49        |
| 6.2.2      | Annex II Marine Mammals .....                                               | 50        |
| 6.2.3      | Annex II Migratory Fish .....                                               | 53        |
| 6.2.4      | Birds .....                                                                 | 55        |
| <b>7.0</b> | <b>In-combination effects .....</b>                                         | <b>61</b> |
| 7.1        | Cumulative Effects Spatial Scope (CESS).....                                | 61        |
| 7.2        | Cumulative Effects Temporal Scope (CETS).....                               | 61        |
| 7.3        | Impact Identification .....                                                 | 61        |
| 7.3.1      | Pathway Identification and Predication of Impacts .....                     | 62        |
| 7.3.2      | Identification of Plans or Projects .....                                   | 62        |
| 7.3.3      | Screening Stage In-combination Effects Assessment Conclusion.....           | 64        |
| <b>8.0</b> | <b>Summary and Conclusions .....</b>                                        | <b>65</b> |
| 8.1        | Summary .....                                                               | 65        |
| 8.2        | Conclusions.....                                                            | 67        |
| <b>9.0</b> | <b>References .....</b>                                                     | <b>69</b> |

## List of tables

|                                                                     |    |
|---------------------------------------------------------------------|----|
| Table 2-1 Overview of Proposed SI Activities .....                  | 6  |
| Table 2-2 Estimated Project Schedule .....                          | 9  |
| Table 5-1 Source-Pathway-Receptor Assessment for the SI Works ..... | 34 |

|                                                                                                                                       |    |
|---------------------------------------------------------------------------------------------------------------------------------------|----|
| Table 5-2 Relevant European Sites and Qualifying Interests to be Considered in Stage 1 Screening for Likely Significant Effects ..... | 39 |
| Table 6-1 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Otter .....              | 49 |
| Table 6-2 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Marine Mammals .....     | 51 |
| Table 6-3 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Migratory Fish .....     | 53 |
| Table 6-4 European sites selected for consideration in the Screening for Appropriate Assessment for Birds .                           | 55 |
| Table 8-1 Summary of European sites and relevant qualifying interests screened in for Likely Significant Effects .....                | 65 |

## List of figures

|                                                                                              |    |
|----------------------------------------------------------------------------------------------|----|
| Figure 1-1 Proposed MUL Map .....                                                            | 2  |
| Figure 2-1 Intertidal zone access via Legg Lane.....                                         | 20 |
| Figure 3-1 Four Stages of Appropriate Assessment .....                                       | 21 |
| Figure 4-1 Map of migration routes of tagged Atlantic salmon (Rikardsen et al., 2021). ..... | 30 |
| Figure 5-1 Relevant European Sites considered in the Stage 1 Screening .....                 | 47 |

## Appendices

Appendix A Drawings

# 1.0 Introduction

## 1.1 Project Background

The Oriel Wind Farm Project is a proposed offshore wind farm in the Irish Sea, off the coast of County Louth (approximately 22 km east of Dundalk town centre and 18 km east of Blackrock). The Project will have a maximum export capacity (MEC) of 375 MW and will consist of 25 offshore wind turbine generators (WTGs). The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore cable corridor extends approximately 11 km southwest from the offshore wind farm area to a landfall location south of Dunany Point. From the landfall, the underground onshore cable will connect the offshore wind farm to an onshore substation, located at Stickillin, east of Ardee, which will then connect to the existing National Electricity Grid at this point. The onshore cable route is approximately 20.1 km length and is predominantly routed along public roads. Oriel Windfarm Limited (hereafter referred to as “the Applicant”) was granted a Maritime Area Consent (MAC) in December 2022 (Ref. MAC No. 2002-MAC 001).

This Maritime Usage Licence Application (MULA) is required to undertake site investigations (hereafter referred to as the SI works), within the MUL Area (defined as the project planning application boundary below the high-water mark (HWM), plus a 4 km buffer around the offshore wind farm area) (See Figure 1-1). In May 2019, the Applicant obtained a Foreshore Licence (reference no. FS006840) for initial surveys in the offshore wind farm area and offshore cable corridor. Under this Foreshore Licence the Applicant undertook both intertidal and offshore surveys which informed the initial engineering design of the wind farm. The Applicant later obtained Foreshore Licence (reference no. FS007383) in May 2023 for further SI works in the offshore wind farm area and cable corridor. Under this foreshore Licence the Applicant undertook geotechnical, geophysical, ecological and metocean surveys in support of the overall Oriel Wind Farm Project. The Applicant now intends to undertake further SI works of the offshore wind farm area and the export cable corridor to investigate the stability of the soil (seabed sediments) for the design of foundations and the detailed routing of the inter array and export cables. These SI works, which are discussed in more detail in Section 2.0 below, are therefore required to support detailed wind farm design.

## Oriel Wind Farm Project

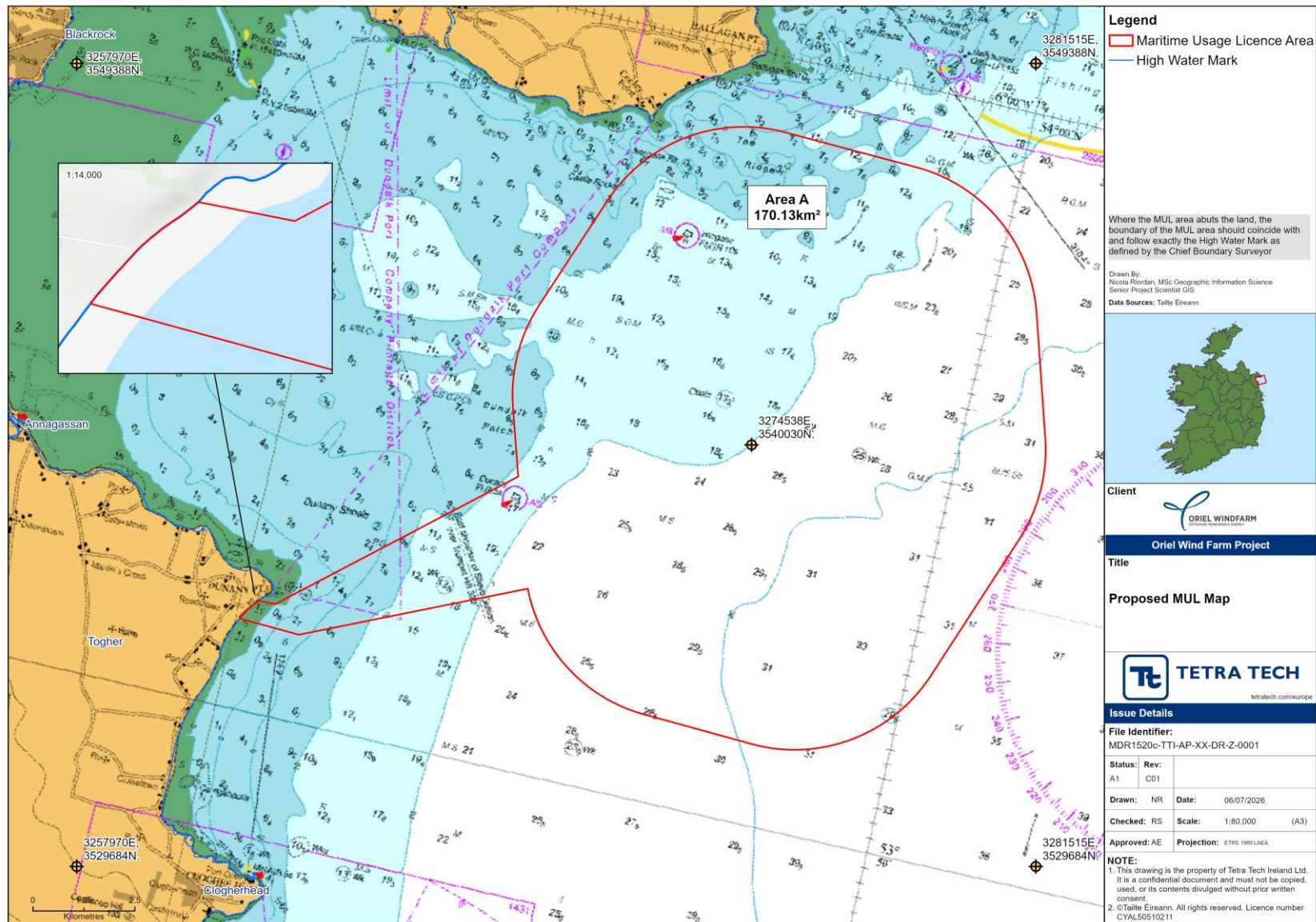


Figure 1-1 Proposed MUL Map

## 1.2 Purpose of this Report

The purpose of this Appropriate Assessment Screening Report is to provide supporting information to accompany an application by the Applicant for a MUL from the Maritime Area Regulatory Authority (MARA).

## 1.3 Statement of Authority

The technical competence of the authors is outlined below.

**Aoife Edgely** is an Associate Marine Scientist in the Environmental Services Business Unit in Tetra Tech. She has over 15 years' experience in the marine science field and is a Chartered Environmentalist and a Full Member of the Institute of Environmental Sciences. Aoife holds an honours degree in Environmental Science from Trinity College Dublin and a master's in marine environmental Protection from Bangor University, Wales. Aoife has delivered the environmental assessments for a wide range of marine and coastal projects, including environmental impact assessment, appropriate assessment and Annex IV species reports.

**Rachael Shaw** is a Project Scientist in the Environmental Services Business Unit in Tetra Tech. She holds a Bachelor's degree in Marine Science from the University of Galway and Master's degree in Climate Change and Managing the Marine Environment from Heriot-Watt University Edinburgh. She has five years' experience working in consultancy, assisting on a wide range of projects from offshore renewable energy projects to flood relief schemes, including marine and terrestrial surveys. She is a full member with Institute of Environmental Sciences (IES).

**Róisín Murphy** is a Scientist in the Environmental Services Business Unit in Tetra Tech. She holds an honours degree in Zoology (B.Sc.) and master's degree in marine biology, both from University College Cork. She has two years' experience as a Project Manager at Cork Nature Network, responsible for marine and river surveys, and one year's experience in marine licensing and flood relief projects within Tetra Tech. She is a qualifying member with IES.

## 1.4 Legislation

### 1.4.1 European Legislation

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (the Habitats Directive) provides protection for habitats and species of European importance; Council Directive 2009/147/EC on the conservation of wild birds (Codified version) (the Birds Directive) aims to protect all of the 500 wild bird species naturally occurring in the European Union (EU). Areas designated for protection under the Habitats Directive are described as Special Areas of Conservation (SAC) and those designated under the Birds Directive as Special Protection Areas (SPA). These sites are known collectively as the Natura 2000 network, which includes European sites (see Section 1.4.2.4). As each member of the EU is required to designate areas in their jurisdictions, the establishment of this network of European sites under Articles 3 to 9 of the Habitats Directive is the key measure to protect nature and biodiversity in the EU.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to have a significant effect on or to adversely affect the integrity of Natura 2000 sites. Article 7 of the Habitats Directive extends the scope of its articles 6(3) and 6(4) to the Birds Directive.

Article 6(3) establishes the requirement for Appropriate Assessment (AA):

*“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. Considering the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to*



*the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the public.”*

Further detail on the stages of AA is provided in Section 3.2.

In the context of the marine works to which this MULA relates, the Habitats and Birds Directives have been transposed into Irish Legislation under, amongst other things, the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended.

Each European site has assigned Conservation Objectives (COs) and a list of Qualifying Interests (QI). The CO concept appears in the eighth recital of the Habitats Directive which reads: *“whereas it is appropriate, in each area designated, to implement the necessary measures having regard to the conservation objectives pursued”*. Article 1 then explains that *“conservation means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status”*.

The National Parks and Wildlife Service (NPWS) has established COs for each European site in Ireland. These are published on their website. In the general introductory notes of their site-specific conservation objectives (SSCO) series publications, NPWS advise that an appropriate assessment based on their *“published conservation objectives will remain valid even if the CO targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out”*. NPWS advise that to assist in that regard, it is essential that the date and version are included when objectives are cited.

## 1.4.2 National Legislation

### 1.4.2.1 Maritime Area Planning Act

The Maritime Area Planning Act, 2021 (as amended) (the MAP Act) established MARA. One of the functions of MARA is to determine applications for the granting of licences to undertake any of the activities included in Schedule 7 of the MAP Act.

The following definitions in relation to Appropriate Assessment (AA) are included in Section 2(1) of the MAP Act:

*“screening for appropriate assessment” shall be construed in accordance with, as appropriate—*

- (a) section 177U of the Act of 2000, or
- (b) Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

*“appropriate assessment” shall be construed in accordance with, as appropriate—*

- (a) section 177V of the Act of 2000, or
- (b) Part 5 of the European Communities (Birds and Natural Habitats) Regulations (S.I. No. 477 of 2011);

where the Act of 2000 refers to the Planning and Development Act 2000 (as amended).

Under Section 112 of the MAP Act, MARA has been designated as a competent authority for the purposes of Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011); and appropriate assessments to which that Part applies.

MARA is required to carry out a screening for Appropriate Assessment (AA) in accordance with Section 117(4)(a) of the MAP Act.

Where MARA determines that an AA is required it shall carry out the AA in accordance with Section 117(7)(a) of the MAP Act.



### 1.4.2.2 Screening Out for AA

Under Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) the competent authority in this case MARA shall determine that an AA of a project is not required where the plan or project is not directly connected with or necessary to the management of the European Site and if it can be excluded on the basis of objective scientific information following screening that the project, individually or in combination with other plans or projects, will have a significant effect on a European site.

### 1.4.2.3 Screening In for AA

Under Regulation 42(6) of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) the competent authority shall determine that an AA of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site. Under Section 117(4) of the MAP Act the MARA shall, as soon as is practicable after it receives a MUL application and if it considers it necessary to do so in its capacity as the competent authority, carry out screening for Appropriate Assessment in respect of the proposed maritime usage the subject of the application.

Where the competent authority determines that an AA is required, they shall make a determination under Article 6(3) of the Habitats Directive as to whether or not the proposed development would adversely affect the integrity of a European site and an Appropriate Assessment shall be carried out by the competent authority before consent is given for the proposed development - see Regulation 42(11) European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

### 1.4.2.4 European Sites and Natura 2000 Sites

The term European site is defined in the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) as:

*“European Site” means—*

- (a) a candidate site of Community importance,*
- (b) a site of Community importance,*
- (c) a candidate special area of conservation,*
- (d) a special area of conservation,*
- (e) a candidate special protection area, or*
- (f) a special protection area.*

The term Natura 2000 is defined in the same Regulations as:

*“Natura 2000” means the European network of special areas of conservation under the Habitats Directive and special protection areas under the Birds Directive, provided for by Article 3(1) of the Habitats Directive and, for the purposes of these Regulations, includes European Sites.*

As such, and as adopted in this report, the term European site refers to one of the sites comprising the Natura 2000 network.

## 2.0 Proposed Maritime Usage

### 2.1.1 Overview

The proposed SI works are detailed in Table 2-1 below. The purpose of these SI works is to provide a reliable basis for detailed design of the Project. The aim of the SI works is to acquire data to a high quality and specification for the site as summarised below and described in the following sections.

The Applicant is seeking a MUL for a period of five years from the date of the granting of the licence.

The proposed SI works will build on the existing detailed knowledge of the site which was gained under previous SI works under foreshore licences (FS006840, awarded 10<sup>th</sup> May 2019 for two years and FS007383, awarded 17<sup>th</sup> May 2023 for three years). The proposed activities within the MUL Area are planned to take place across phases. Geophysical and geotechnical surveys and investigations will be sequential with the results of the geophysical campaign and previous geophysical data used to inform the geotechnical campaign. The remaining surveys and investigations (e.g., environmental, metocean etc.) can take place at any time during the operational period of the MUL.

It should be noted that the geophysical and geotechnical campaigns may be further sub-divided depending on the availability of suitable vessels and equipment and the location of the surveys, e.g. intertidal, nearshore and offshore areas. Therefore, geophysical and geotechnical investigations in some areas may be completed in advance of geophysical and geotechnical activities in other areas.

Environmental surveys will be undertaken within the MUL Area to provide further information on the baseline conditions. Depending on the specific requirements of these surveys and logistics, they may be undertaken simultaneously with and/or independently from the geophysical and geotechnical campaigns.

Proposed SI locations are provided in Appendix A. These proposed locations are subject to refinement based on the results of the geophysical and environmental surveys, informed by previous and current survey campaigns, e.g. avoidance of a potentially sensitive habitat. Similarly, a location may be moved due to the presence of obstructions/refusals at individual locations, i.e. where a physical object, e.g. a subsurface boulder, prevents the borehole, CPT, etc., from reaching its target depth. In such circumstances, the borehole will be moved to another nearby location away from the obstruction and drilled again to the target depth.

Following the assessment of the results of the SI works, it may be necessary to undertake further SI works in particular areas within the MUL Area, e.g., along routes for the export cable corridor and approaches to the landfall. The proposed SI works, including the quantities detailed and assessed in this MULA, include contingencies to cover any follow up investigations that may be undertaken at refined locations.

An overview of SI works is presented below in Table 2-1, followed by a more detailed breakdown of the proposed survey elements.

Table 2-1 Overview of Proposed SI Activities

| Survey Type                                                             | Survey Elements<br>(indicative equipment) | Indicative Equipment<br>(where applicable)                                                              | Maximum Quantity<br>(where relevant) |
|-------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------|
| Marine Geophysical<br>Surveys<br><br>(undertaken from survey<br>vessel) | Multi beam echosounder<br>(MBES)          | Kongsberg EM series,<br>Kongsberg Geoswath series, R2<br>Sonic series & Reson Teledyne<br>Seabat series | N/A                                  |
|                                                                         | Side scan sonar (SSS)                     | Edgetech FS-4200 series, C-<br>Max CM2 series and Klein<br>System 3900-5000                             |                                      |

| Survey Type                                                                               | Survey Elements (indicative equipment)         | Indicative Equipment (where applicable)                                                                                                                                                                                                                                                                                                                                 | Maximum Quantity (where relevant) |
|-------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                                                                           | Sub-bottom profiler (SBP) - parametric         | Innomar smart, quattro (QBM) sixpack (HBM), Innomar SES 2000 compact light, Innomar standard quattro (DBM) sixpack (DBM), Innomar medium 100                                                                                                                                                                                                                            |                                   |
|                                                                                           | SBP – Chirper/Pinger                           | Kongsberg Geopulse, Edgetech 424/512, Knudsen 3202, Klein K-Chirp                                                                                                                                                                                                                                                                                                       |                                   |
|                                                                                           | 2D/3D Ultra-high-resolution seismic (UHRS)     | Suitable Sparker / Boomer up to 1000 joules.                                                                                                                                                                                                                                                                                                                            |                                   |
|                                                                                           | Magnetometer                                   | G-882 Marine Magnetometer                                                                                                                                                                                                                                                                                                                                               |                                   |
|                                                                                           | Ultra short baseline (USBL) positioning system | Edgetech BATS, ORE offshore trackpoint, Sonardyne Fusion/Ranger/Scout, IxBlue GAPS, Kongberg HiPAP                                                                                                                                                                                                                                                                      |                                   |
| Intertidal Geophysical (land-based below HWM)                                             | Seismic Refraction                             | Geophone Arrays: <ul style="list-style-type: none"> <li>• Geosense 4.5 Hz Geophones;</li> <li>• Mark Products L-28LB Geophone;</li> <li>• Geospace GS-11D Geophone; or similar</li> </ul> Digital Seismographs <ul style="list-style-type: none"> <li>• Geometrics Geode Seismograph,</li> <li>• Seistronix RAS-24;</li> <li>• ABEM Terraloc Pro; or similar</li> </ul> | N/A                               |
|                                                                                           | Ground Penetrating Radar (GPR)                 | IDS GeoRadar Stream DP GPR System<br><br>Leica DS2000 GPR System; or similar.                                                                                                                                                                                                                                                                                           |                                   |
| Marine Geotechnical Surveys<br><br>(undertaken from survey vessel(s)/jack-up barge (JUB)) | Vibrocore/gravity coring                       | Drill rig and JUB/drilling vessel                                                                                                                                                                                                                                                                                                                                       | 41                                |
|                                                                                           | Rotary core boreholes                          | Geobor-S                                                                                                                                                                                                                                                                                                                                                                | 78                                |
|                                                                                           | Cone penetration testing (CPT) and standard    | Push sampler/rotary core, hammer sampler                                                                                                                                                                                                                                                                                                                                | 60                                |

| Survey Type                                               | Survey Elements (indicative equipment)          | Indicative Equipment (where applicable)                                                                                                                                                         | Maximum Quantity (where relevant)                                                      |
|-----------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|                                                           | penetration testing (SPT) at borehole locations |                                                                                                                                                                                                 |                                                                                        |
| Intertidal Geotechnical surveys (land-based below HWM)    | Trial pit/borehole                              | Bobcat, backhoe or excavator<br>Drill rig and JUB / drilling vessel                                                                                                                             | 6 boreholes (max. depth 10m)<br>12 trial pits (max. depth 5m, 2m <sup>2</sup> in plan) |
| Environmental Surveys (undertaken from survey vessel(s))  | Marine mammal static acoustic monitoring (SAM)  | CPODs/FPODs<br>(incl. heavy weight mooring blocks of c. 250kg, clump chain and rope with either an acoustic release mechanism and benthic buoy or a robust mooring with a surface marker buoy). | 12                                                                                     |
|                                                           | Water quality samples                           | Sondes (incl. surface or seabed buoy)<br>Niskin bottle                                                                                                                                          | 12                                                                                     |
|                                                           | Grab sampling                                   | Mini Hammond grab or Van Veen grab (0.1m <sup>2</sup> )                                                                                                                                         | 60                                                                                     |
|                                                           | Fish and shellfish surveys                      | Sondes (incl. surface or seabed buoy)<br>Potting and trawl survey                                                                                                                               | 6<br>12 locations                                                                      |
| Intertidal Environmental Surveys                          | Quadrat and dig over surveys                    | Refer to section 2.1.7.3                                                                                                                                                                        | 12                                                                                     |
| Metocean Survey (deployed by vessel and moored to seabed) | Metocean buoy                                   | Refer to section 2.1.8.12.1.8.2                                                                                                                                                                 | 1 (for 12-month period)                                                                |
|                                                           | Acoustic doppler current profiler (ADCP)        | Refer to section 2.1.8.2                                                                                                                                                                        | 8                                                                                      |

## 2.1.2 Estimated Project Schedule/ Programme

The Applicant proposes a SI works schedule that will be phased over a five-year period. The intention is to begin SI works as soon as feasible following license award, with a phased programme of investigations, capitalising on suitable weather windows and vessel availability over this time period. This phased approach will progress the overall development towards detailed design stage. The exact survey schedule is dependent on the availability of the supply chain and therefore exact timelines for the surveys cannot be determined in advance of securing a MUL.

The exact dates for the surveys are to be determined pending the appointment of survey contractors but based on the estimated scope of works to be conducted the likely timeframe for each project phase has been estimated in Table 2-2 below. Contingencies have been built into the quantities to allow for future SI works within the MUL five-year period as more information becomes available. The estimated timeframes are subject

to change based on variables such as weather conditions, unforeseen seabed conditions, unforeseen obstructions, vessel availability etc.

Geophysical site-specific surveys were conducted for the Oriel Wind Farm Project in 2019 and 2022 and information is available to inform geotechnical investigations. Geophysical surveys are also proposed under this MUL.

Mobilisation location will be dependent on the survey contractor, who may choose to mobilise from their home port, port of previous job or local port. The local port options for mobilisation, for example, could include Dundalk Port or Dublin Port depending on vessel size and marine traffic restrictions.

The SI survey works will be carried out on a 24-hour and 7 days per week basis, subject to sea state and tidal conditions, except for environmental surveys, which are expected to take place during daylight hours.

Table 2-2 Estimated Project Schedule

|                                             | Year 1 (2027) |     |     |     | Year 2 (2028) |     |     |     | Year 3 (2029) |     |     |     | Year 4 (2030) |     |     |     | Year 5 (2031) |     |     |     |
|---------------------------------------------|---------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-----|-----|-----|
|                                             | Q 1           | Q 2 | Q 3 | Q 4 | Q 1           | Q 2 | Q 3 | Q 4 | Q 1           | Q 2 | Q 3 | Q 4 | Q 1           | Q 2 | Q 3 | Q 4 | Q 1           | Q 2 | Q 3 | Q 4 |
| Geotechnical (Marine and Intertidal)        |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |
| Geophysical (Marine and Intertidal)         |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |
| Marine and Intertidal Environmental Surveys |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |
| Metocean                                    |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |               |     |     |     |

### 2.1.3 Marine Geophysical Survey

The purpose of the geophysical survey is to characterise the seabed and sub-surface geology and geotechnical parameters within the survey area in order to supplement the information gathered in the 2019 and 2022 site-specific geophysical surveys and previous INFOMAR surveys of the site. This additional data will be used to better understand the surface and sub-surface structure and stratigraphy, including seabed sedimentation, morphology and mobility and sub-surface stratigraphy and geohazards. This will support the wind farm design, inter-array and offshore cable corridor and determine the design and installation methodology.

The objectives of the geophysical survey are to:

- Produce detailed bathymetric mapping;
- Obtain detailed seabed features, morphology and sediment;
- Obtain detailed sub-surface structure and stratigraphy;
- Acquire both shallow and deep geological cross-sections of the wind farm site; and
- Support cable design and installation including cable routing.

The geophysical survey will include bathymetric, side scan sonar, magnetometry and seismic sounding of the proposed site. Details of the exact survey equipment will be made available prior to commencement of the works; however, it is envisaged that the geophysical data acquisition will involve the following acoustic-based techniques:

- Multi beam echosounder (MBES) system for detailed bathymetric mapping;
- Side scan sonar (SSS) for detailed seabed sediment and morphological mapping;
- Magnetometer for detecting geomorphological anomalies and ferrous objects;
- Sub-bottom profiling (SBP), both single and multi-sourcings, to identify and characterise the layers of sediment/rock underneath the seafloor along the cable route corridors;
- Ultra-high-resolution seismic (UHRS) to identify and characterise the layers of sediment/rock underneath the seafloor within the windfarm site; and
- Intertidal geophysical surveys including seismic, electrical resistivity and electromagnetic methods.

An ultra-short baseline (USBL) positioning system will be utilised where required to monitor the position of towed equipment. The USBL system consists of a multi-element transducer mounted on the hull of the vessel and a transponder attached to the towed equipment (e.g. side-scan sonar). Triangulation is achieved using acoustic signals transmitted and detected at regular intervals from which bearing, depth and distance can be calculated. The USBL is coincident with towfish surveys (e.g. SSS, magnetometer).

USBL equipment is widely used by offshore commercial and research vessels where positional accuracy of towed survey equipment is critical. The emitted pulses will be short pulse width 'pings', approximately in the range of 20-35kHz and with a source level of up to ~200dB re 1µPa @1m (peak).

The geophysical survey will comprise transects with a total length of circa 84 km and a line spacing distance from tens of metres up to 1 km between each transect. The seismic source will detect the geological strata to a depth of 40 m below the seabed (bsb).

A suitably qualified archaeologist will review the geophysical survey outputs for anomalies. The findings will be compiled and presented in an archaeological assessment report. Where deemed necessary by the project archaeologist and as agreed with the National Monuments Service (NMS), an archaeologist/ geoarchaeologist may be required to be present during geotechnical investigations to take samples for archaeological inspection. Samples will be removed from the investigation location, properly stored and transported from site for more detailed assessment and appraisal.

#### 2.1.3.1 Multibeam Echosounder Survey

The MBES system will be used to provide detailed bathymetric mapping throughout the survey area. An MBES is a type of sonar (acoustic surveying) used in seabed mapping wherein acoustic waves are used to indicate depth-to-seabed. The device is typically affixed to a vessel's hull or towed in its wake. The process is non-intrusive, and the device will not make contact with the seabed at any point. The Norbit Winghead B51S is an indicative example of a MBES system to be used in the completion of these works. The equipment will operate at a nominal frequency of 400kHz.

#### 2.1.3.2 Side-Scan Sonar Survey

The side scan sonar will be used to achieve detailed seabed morphology and seafloor mapping of the survey area. The survey is carried out using a sonar device attached to a vessel that emits fan-shaped pulses down towards the sea floor across a wide-angle perpendicular to the path of the sensor through the water. The intensity of the acoustic reflections from the seafloor of this fan shaped beam is recorded in a series of cross-track slices.

When stitched together along the direction of motion, these slices form an image of the sea bottom within the swath (coverage width) of the beam. The equipment will operate within a frequency range of 100-500kHz with source levels at 235dB Lpk re 1µPa at 1 metre range. The Edgetech FS-4200 series, Klein System 3900 or similar is an indicative example.

### 2.1.3.3 Magnetometer Survey

A magnetometer detects ferrous objects and as such is used to locate and identify ferrous objects on or buried in the seabed within the range of the magnetometer. The device precisely measures the earth's magnetic field and detects any anomalies, which represent ferrous objects such as lost anchors, sunken ships and buried pipes. The magnetometer is typically towed behind a survey vessel or affixed to a vessel's hull. The process is non-intrusive, and the device will not make any physical contact with the seabed at any point. The G-882 Marine Magnetometer is an indicative example.

### 2.1.3.4 Sub-Bottom Profiling Survey

This device uses reflection seismology to give a 2D image of the sub-seabed geology. It is typically towed behind the vessel during survey works or affixed to the vessel's hull. The process is non-intrusive, and the device will not make any physical contact with the seabed at any point.

The Innomar SES-2000 Quattro Parametric SBP is as an indicative example of a parametric type SBP while a Kongsberg Geopulse or Edgetech 424 is as an indicative example of a chirper/pinger type SBP. The shallow SBP system will be used within the cable route corridor and will have the following general specifications:

- A vertical resolution better than 0.2 metres; and
- Penetration of at least 5 metres.

The profiler will be supplied with the following recorders and peripheral processing equipment:

- Fire control unit;
- Time varied gain;
- Swell filter; and
- Bandpass or Time Varying Filters (TVF).

### 2.1.3.5 Ultra-high Resolution Seismic (UHRs)

Commonly used variants of this technology are known as "Sparkers" and "Boomers". It will have the following characteristics as a minimum:

- Repeatable source;
- Main output at frequencies between 1kHz and 5kHz;
- Broadband width in excess of 2.5kHz at -10dB;
- Vertical resolution better than 0.5 metres;
- Penetration of at least 50 metres; and
- Variable energy levels 100-1000 joules;

One or more hydrophone streamers will be supplied. The streamer will be neutrally buoyant or controlled, well maintained and free of air bubbles. The hydrophone will have a response appropriate to the source used but will generally have a flat response between 500Hz and 10kHz. The streamer will have at least 100 channels and be at least 100m long. A tail buoy with a radar reflector will be used to mark the streamer.

The survey may be conducted in either a 2D (single streamer) or 3D (dual streamer) format.

## 2.1.4 Intertidal Geophysical Survey

Conventional land-based geophysical surveys will be undertaken below the HWM. These surveys will include seismic refraction and ground penetrating radar (GPR). Those elements of the land-based survey that occur within the MUL Area are activities included in this MULA. This MULA is not seeking a licence for any land-based works which will take place outside of the maritime area.



Where required, prior to intrusive surveys in the intertidal zone, a suitably qualified archaeologist will undertake a walkover inspection of the intertidal area at low tide, during daylight hours. The inspection will include the use of handheld metal-detectors, photographic survey and drone survey, where applicable. Investigations involving handheld metal-detectors will include a series of transects at 10 m intervals across the accessible intertidal area. Where deemed necessary by the project archaeologist, and as agreed through consultation with the National Monuments Service, an archaeologist/ geoarchaeologist may be required to be present at the location of geotechnical investigations, to take samples for archaeological inspection. Samples may be removed from the investigation location, properly stored and transported from site for more detailed assessment and appraisal.

#### 2.1.4.1 Seismic Refraction

The seismic refraction method utilises the refraction of seismic waves as they pass through various rock or soil layers to analyse underground geological conditions and structures.

Seismic refraction profiles will be conducted using onshore survey tools during low tide in the intertidal zone. A sound source (typically a sledgehammer striking a metal plate) will generate compressional wave energy. These refracted waves will be captured by a series of geophones and logged on a digital seismograph. The locations and elevations of the geophones will be documented using GPS technology.

Indicative Equipment:

- Geophone Arrays:
  - Geosense 4.5 Hz Geophones;
  - Mark Products L-28LB Geophone;
  - Geospace GS-11D Geophone; or similar.
- Digital Seismographs:
  - Geometrics Geode Seismograph,
  - Seistronix RAS-24;
  - ABEM Terraloc Pro; or similar.

#### 2.1.4.2 Ground Penetrating Radar

GPR utilises the reflection of electromagnetic waves as they are returned by rock or soil layers to analyse underground geological conditions and structures.

GPR will be completed during low tide in the intertidal zone. A GPR trolley will be pushed over the area to be scanned and the results analysed by a technician to determine subsurface characteristics. Indicative equipment such as the IDS GeoRadar Stream DP GPR System, Leica DS2000 GPR System or similar will be utilised.

### 2.1.5 Marine Geotechnical Surveys

The purpose of the geotechnical survey is to provide relevant information about the stability of the soil to a depth below which possible existence of weak formations will not influence the safety or performance of the wind turbine and its support structure.

The geotechnical survey will include 26 no. deep investigation locations (boreholes) and 41 no. shallow investigation locations (vibrocores).

#### 2.1.5.1 Rotary Core Boreholes

Deep investigations will be carried out at 26 proposed structure locations (25 wind turbine locations and one offshore substation location). Each deep investigation location may require up to 3 drilled boreholes with a

target depth of 40 m below the seabed. Thus, up to 78 geotechnical boreholes may be drilled. See Appendix A for proposed borehole location.

The equipment used to drill the boreholes will follow the ISO and API technical specifications for drilling equipment and at a minimum will have:

- A heave motion compensator system on board (seabed frame and/or drill string) with a minimum heave compensation of 1.5m;
- Capability of mud production to different densities (when mud production is required for the works). The mud shall be water or bio-degradable organic polymer.

A detailed description of the soil types, and the in situ geotechnical properties determined for the boreholes will be recorded in the boring log to characterise the strata.

Coring and sampling will be done in general accordance with EN ISO22475-1 Geotechnical Investigation and Testing. Rotary coring equipment, such as Geobor-S is expected to be utilised.

In situ testing will include the option of either down-hole wireline piezocone penetration testing (PCPT) associated to PS logging or down-hole wireline seismic cone penetration testing (SCPT) over full length of borehole.

The boreholes are to be advanced by alternating PCPT/SCPT and push/core sampling; requirements will depend on the material type encountered. Within a granular deposit, the boreholes are to be advanced by alternating PCPT/SCPT and push sample. Where the sample recovery is poor using the push sampler, a hammer sampler will be used instead. Blow counts measured during hammer sampling will be recorded and presented on the Borehole Logs.

Within the cohesive deposits, the boreholes are to be advanced by PCPT/SCPT followed by two push samples (repeat cycle). Rotary coring may be used instead of push sampling in suitable materials, in which case the CPT and cores will be alternated.

The samples/cores will be recovered in liners or in Shelby tubes for all soil types and the appropriate technique will be selected to minimise soil disturbance and maximize recovery.

SCPT tests will be executed at a minimum of four of the locations, which will be confirmed in consultation with geophysical survey results. Two seismic measurements will be carried out during each SCPT stroke at a depth interval of 1m; the envisaged volume is 40-60 SCPT tests in total.

#### **2.1.5.2 Standard Penetration tests (SPTs)**

SI works will include Standard Penetration Tests (SPTs) using a 50mm split spoon sampler and occasional jacking operations to deploy, stabilise, or demobilise the drill barge and associated equipment. Both SPTs and jacking of barge piles generate noise and low-frequency vibration including hammer impacts during SPTs and hydraulic jacking or driving systems used to set or adjust the position of the JUB.

#### **2.1.5.3 Vibrocore/ Gravity Core Investigations**

The inter-array cable routes and offshore cable corridor will be surveyed with up to 41 vibrocores/gravity cores within the inter-array area and offshore cable corridor. The cores will be carried out along the line of the cable routes, which are still to be defined. See Appendix A for proposed vibrocore/gravity core locations.

Vibrocoreing will be performed where cohesionless soil is expected. The rig will be fitted with a PVC liner, core catcher and cutting shoe. The vibrocorer will be lowered onto the seabed, position and depth will be noted, after which the vibrocoreing process will start. Upon refusal or at the target depth, the stop condition will be recorded and the vibrocorer will be recovered on deck where the recovery rate will be measured. If required, a core catcher will be used to prevent the sample dropping out of the PVC liner.

All cores will be examined and tested offshore before any sealing of the sample. Soil found in the vibrocoreing shoe will be stored in a bag.

Gravity coring (wireline self-weight penetration sampler) will be performed where cohesive soil is expected. The rig will be equipped with a PVC liner. The gravity corer will be lowered on the seabed and penetrates in the seabed under its own weight. Upon refusal or at target depth, the gravity core will be recovered on deck where the recovery rate will be measured.

All cores will be examined and tested offshore before any sealing of samples.

## 2.1.6 Intertidal Geotechnical Survey

### 2.1.6.1 Trial Pit/ Borehole Investigations

Trial pits will be excavated across intertidal locations (below the HWM) along the proposed offshore cable corridor. Trial pits will be excavated, logged, backfilled and reinstated during a single tidal cycle. Excavated material will be temporarily stored and replaced following the sequence in which it was removed. Subject to access and anticipated ground conditions, trial pits will be excavated manually or using a mechanical backhoe. Existing land access routes to investigation locations will be used to the extent practicable.

Up to 12 no. trial pit investigation locations are proposed in the intertidal area. Trial pits will be excavated to a depth of up to 5 m and will be 2 m<sup>2</sup> in plan. Up to 6 boreholes will be drilled in the intertidal area using a drilling rig with a target depth of up to 10m. All excavated locations to be backfilled immediately on completion of the investigation. Cores and CPTs may be taken from the boreholes or trial pits.

## 2.1.7 Environmental Surveys

The purpose of the environmental surveys is to update the baseline data collected from earlier environmental surveys and to ensure that the environmental data for the Oriel Wind Farm Project remains up to date. The proposed surveys are set out in the following sections.

### 2.1.7.1 CPODs

It is proposed to deploy up to twelve (12) FPOD or CPOD devices for static acoustic monitoring (SAM) of cetaceans. The devices will provide acoustic assessment of the presence/absence and species types of cetaceans (whales and dolphins) to i) allow for the recording species difficult to detect visually such as harbour porpoise, ii) provide data on other factors such as diel and tidal presence at the site and iii) to create a dataset with which to determine any effects of future construction or operation of a windfarm at a resolution which is relevant to managers.

A FPOD or CPOD is a self-contained computer and hydrophone in a sealed sonde approximately 1m in length. The FPOD or CPOD can log the times and duration of click trains which resemble the echo-location clicks produced by porpoises and dolphins. SAM is independent of weather conditions once deployed and thus ensures high quality data is collected. Data collection will be at a small spatial scale (typical detection distances of 250m (porpoises) to 800m (dolphins)). Each FPOD or CPOD will have robust, heavy weight mooring blocks of c. 250kg, clump chain and rope with either an acoustic release mechanism and benthic buoy or a robust mooring with a surface marker buoy. Batteries will be replaced and data downloaded every 3/4 months. Deployment and servicing will be undertaken from a survey vessel.

### 2.1.7.2 Water Quality Sampling and Monitoring

It is proposed to sample water quality at different depths and locations throughout the offshore wind farm area. A Niskin bottle (or similar) will be used to obtain a sufficient sample of water at the surface (< 1m depth) and a second sample just above the seabed (~1m) for the subsequent chemical analysis. This will be lowered and retrieved from a survey vessel.

It is proposed to deploy up to 12 sondes for water quality monitoring through the water column – these will be used to monitor a range of parameters including turbidity, salinity, temperature, pH, dissolved oxygen and electrical conductivity. Sondes will be either suspended from a surface marker buoy or a benthic buoy with

acoustic release at a range of depths dependent on survey requirements. Each buoy will have a robust mooring on the seabed similar to the CPOD mooring described above.

#### 2.1.7.3 Subtidal and Intertidal Sampling

Subtidal surveys will comprise drop down video (DDV) and/or remote operated vehicle (ROV) inspection and the taking of grab samples as required in order to identify benthic habitats and sediment characteristics. DDV/ROV activity will be passive and non-intrusive and will not interact with the seabed.

At locations determined suitable for grab sampling effort by the DDV analysis or geophysical data review, a 0.1 m<sup>2</sup> Day grab, mini-Hamon or Van Veen grab will be deployed from a suitable vessel to collect sediment samples. Each sample will be 1-5kg in mass. Up to 60 grab samples will be collected within the offshore wind farm area and along the offshore cable corridor.

A walkover transect survey will be undertaken. Quadrat sampling and manual digging will be undertaken by hand at 12 locations in the intertidal zone to collect sediment samples. Samples will be analysed to determine the benthic faunal community present and sediment geochemistry.

#### 2.1.7.4 Fish and Shellfish Surveys

Up to 6 sondes will be deployed for the tracking of fish or shellfish within the wind farm and export cable corridor. Similar to the CPODs and water quality sondes, these sondes for the tracking of fish or shellfish will be attached to a robust mooring with either a benthic buoy and acoustic release and/or a surface marker buoy.

A potting survey and trawl survey will be conducted. Surveys will be designed to undertake investigative sampling. Indicatively it may include twelve locations for potting and trawl surveys within the proposed offshore wind farm area and/or along the proposed offshore cable corridor. The surveys may be conducted over several weeks.

### 2.1.8 Metocean Survey

The purpose of the metocean survey is to obtain site specific atmospheric, wave and wind data over a minimum period of 12 months. All metocean survey works will occur at one location within the marine survey area. The location will be determined following the appointment of a contractor.

#### 2.1.8.1 Floating LiDAR

The data will be collected via a floating weather station, which will include a wave rider and a wind measurement LiDAR current profiler. The wave rider will be used to collect wave height and current data across the site, while the LiDAR system will be used to measure the wind characteristics within the site. This equipment will be mounted on specifically designed floating buoys which are moored to the seabed using an anchor chain and clump weights. All equipment including the moorings will be removed following completion of the survey.

#### 2.1.8.2 Acoustic Doppler Current Profilers

Up to eight Acoustic Doppler Current Profilers (ADCPs) will be moored to the seabed using an anchor chain and clump weights at varying heights above the seabed. These will be periodically recovered by either acoustic release systems or surface buoys. All equipment including the moorings will be removed following completion of the survey.

An ADCP is a hydroacoustic current meter similar to a sonar, used to measure water current velocities over a depth range using the Doppler effect of sound waves scattered back from particles within the water column. ADCP units containing both wave and current sensors, and turbidity and total suspended solids sensors will be deployed for no less than one continuous year with a maximum deployment period of up to 36 months at each location (servicing is anticipated every 12 weeks in order to replace ADCP batteries).

## 2.1.9 Survey Vessels

The proposed marine survey works will be carried out by dedicated marine vessels, suitable for the scope of the work required, the water depth and the anticipated conditions of the survey area and the transit routes. The exact equipment to be used will be confirmed following a tender process to procure the site investigation contractor.

Separate survey vessels will be used for each activity and are outlined in the following sections. A larger vessel or jack-up barge (JUB) will be required to complete the offshore geotechnical works with smaller vessels for the geophysical, metocean and ecological surveys. A smaller Rigid Hulled Inflatable Boat (RHIB) type vessel may be used for works in shallow waters. Unmanned survey vessels (USVs) may be used for geophysical surveys across the site. USVs will be fully licenced to operate in Irish waters. Up to three vessels may be required to operate concurrently in the MUL area under coordinated simultaneous operations (SIMOPS). This will allow for flexibility to conduct proposed geotechnical and geophysical works within the MUL Area to ensure that the Applicant can act on available weather windows and sub-contractor availability. Land based drilling and excavators will be used for the investigations and surveys within the intertidal zone. The types of vessels proposed to be employed are described in the sections below.

These vessels will be comparable and of a similar size to those typically used in the industry for carrying out similar technical work and will possess all relevant classification certificates.

The vessels will conform to the following minimum requirements as appropriate:

1. Station-keeping and sea keeping capabilities required by the specified work at the proposed time of year; the appointed contractor may provide supplemental tug assistance if such assistance benefits the operation;
2. Endurance (e.g. fuel, water, stores, etc.) to undertake the required survey works;
3. Staffing to allow all planned work to be carried out as a continuous operation (on a 24 hour per day basis for the offshore activities and on a 12 hour per day basis for the inshore activities);
4. Equipment and spares with necessary tools for all specified works;
5. Appropriate accommodation and messing facilities on board; and
6. Adequate soil laboratory testing facility, as required.

The vessels used for the offshore surveys will be sound and capable of remaining safely at sea for a minimum of 30 days under weather conditions typically encountered in the MUL Area at the time of year that the operations are to take place. The appointed contractor will be responsible for all shipboard systems and equipment calibration and re-calibration, including spares. For every 30 days of operations the vessels will accrue at least one day of maintenance time.

Vessels will have breadth and draft of suitable proportions to provide adequate stability for the duration of the intended operation. The vessels will be capable of passage speeds in excess of 10 knots and extended survey operations at speeds 4 knots or less.

In addition to AIS-A and Active Radar Enhancing Systems, the manned vessels will have the following communications equipment as a minimum:

- Multi-channel VHF and HF radio capable of working at all marine frequencies and with a dual watch facility;
- Mobile phone;
- Hand-held radios;
- Frame and winch for the deployment of equipment and sensors, sized for the required equipment/sensors loads and pulling force. The winch speed and size must be compatible with planned surveys;

- Gyro-compass;
- SATCOM (satellite communication) facilities (phone/fax and e-mail); and
- Two independent Differential Global Positioning Systems (DGPS), a primary and secondary system (DGPS has a greater degree of accuracy than GPS).

All drilling survey vessels and marine support vessels will conform to the relevant ISO (International Organization for Standardization) and API (American Petroleum Institute) technical specifications for drilling equipment.

#### 2.1.9.1 Offshore Vessels

The survey vessels used for offshore works will be either a JUB and/or a Dynamic Positioning (DP) vessel configuration.

JUBs utilise a fixed anchoring system in order to maintain the required position within the site. The vessel consists of a self-elevating platform and several “legs”, which are deployed to the ocean floor mooring the vessel in place.

The survey works are carried out from the self-elevating platform, which is raised above the water’s surface. If used, the JUB will meet with the following minimum requirements:

- The vessel will have at least four mooring points;
- The self-elevating platform must be permanently manned (i.e. off-shift personnel to stay onboard even if the accommodation is not a permanent equipment of the JUB);
- The platform must be provided with a class certificate verifying the provision of adequate safety equipment for the type of vessel and the number of on-board personnel; and
- The platform should be certified in compliance with the MODU Code and the BWEA guideline.

DP vessels maintain station through thruster and propeller systems which use satellite DGPS signals, allowing the vessels to be positioned over any point on the seabed and maintain position without employing a fixed anchoring system. Using thrusters or propellers, a DP vessel can maintain position within a 2m to 0.5m window depending on the sea state/weather conditions and available power. The vessel may also transit under DP control along a given pre-determined path.

If used, a DP vessel will meet the following minimum requirements:

- The vessel must be fully equipped with a Class II DP system as a minimum; and
- Two DP certified operators with the necessary experience must be members of the crew.

The offshore works will be carried out on a 24-hour shift basis, with personnel working two 12-hour shifts. This will allow the works to be continuous. If the survey works are delayed through weather constraints or other matters then a second vessel may be used to ensure that the works are completed within the required time period. Full assessment of all SIMOPS will be carried out if a second vessel is used.

#### 2.1.9.2 Nearshore Vessel

The smaller, nearshore vessel e.g., rib, will be used in locations where the water depth is too shallow for the larger, offshore vessel to carry out the works. This vessel does not need to have a dynamic positioning system, however, must have full DGPS capability. The vessel is usually held on station by joy-stick control and will deploy an anchor to assist in maintaining station (depending on sea state and weather conditions). The smaller vessel will use similar equipment to the larger vessel to carry out the required survey works.



### 2.1.9.3 Unmanned Survey Vessels

An unmanned surface vessel (USV) may be used. The vessel would not carry any surveyors on board and would be controlled from the land. The USV would be escorted out to the survey area with a manned vessel and a pre-watch MMO survey completed prior to commencement of the survey.

### 2.1.9.4 Survey Navigation

All navigation equipment and instrumentation will be calibrated and used correctly. Calibration and/or verification will be repeated in the event of any equipment malfunction, which may nullify earlier calibrations and/or verifications.

Qualified surveyors will be used to operate the navigation and positioning equipment continuously throughout the survey while maintaining a continuous log of all navigation activities throughout the survey.

Sufficient survey and positioning spares and consumables will be provided to enable the survey to be completed without any degradation of navigation and positioning quality and effectiveness and without the need to return to port to acquire additional equipment.

## 2.1.10 General Requirements

### 2.1.10.1 Quality Assurance

The marine survey Contractor will:

- Operate Quality and Environmental Management Systems (EMS) based on and conforming to ISO9001:2008;
- Provide a Quality Management Plan (QMP) to Oriel for all the marine operations; and
- Provide operational procedures to Oriel for all the marine operations.

### 2.1.10.2 Operating Permits

The marine survey Contractor will obtain and comply with all necessary marine operational permits including routine and customary vessel/crew/equipment clearances from Customs Agencies, Port Authorities, Marine Survey Office (MSO), etc.

### 2.1.10.3 Health and Safety

Health, Safety and Environmental protection will be given foremost consideration in the execution of the work and will be promoted in a proactive and highly visible manner throughout the workforce. The marine survey Contractor will operate International Safety Management (ISM) and Health Environmental and Safety (HES) systems based on legislation relevant to the proposed activities. The marine survey Contractor will have an overall Health, Safety, Security and Environmental (HSSE) plan for each stage of all marine operations. The plan will cover all parties and operations.

The Applicant's Health and Safety Protocols will be followed by both survey and ship's crew. Care will be taken to maintain contact with fishing vessels operating within the area of operations. The Applicant will not knowingly damage or interfere with the property of any fishers while carrying out SI activities. The contractor will ensure notifications of the intended work and timelines are posted in the relevant press well ahead of schedule and a fisheries liaison officer (FLO) will be employed.

All vessels will operate under a certificated Safety Management System (SMS) that provides policies, procedures, and a framework for continuous improvement to ensure the safety of personnel onboard.



#### 2.1.10.4 PSDP/ PSCS

The appointed contractor will designate a competent Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) under the relevant legislation. Method Statements and Risk Assessments will be prepared prior to any works commencing.

#### 2.1.10.5 Environmental Protocols

The Applicant will implement a number of industry standard environmental protocols to address potential environmental impacts during the survey works.

Environmental factors will be taken into account in all decisions during the survey campaign. Environmental efforts will be preventative and where required as a condition of permitting, the Contractor will form and comply with the obligations of an appropriate Environmental Management Plan (EMP) and those conditions of the MUL relating to environmental protection.

All vessels will comply with the latest International Maritime Organization (IMO) and Safety of Life at Sea (SOLAS) and environmental requirements for their classification and with any national requirement of the territorial or continental / EEZ waters to be operated in. All vessels be operated and comply with the requirements of the Marine Co-ordination Management System operated by the Applicant for all its offshore wind farm project sites. This system includes the vetting and tracking of all vessels and personnel working offshore.

The appointed contractor will take particular care when handling or storing hazardous materials, radiation sources and chemicals. All storage and handling must be carried out in accordance with the Dangerous Substances Act (1972) and supporting regulations, appropriate safety precautions must be taken, and safety clothing must be worn as necessary. Liquid or non-liquid pollutants or waste material will not be dumped, thrown or otherwise disposed of into the sea. All refuse and materials will be kept onboard the vessel and safely disposed of onshore according to the MARPOL (International Convention for the Prevention of Pollution from Ships) convention. All substances handled and/or used whilst undertaking the works will be handled, used, stored and documented in compliance with the Dangerous Substances Act 1972 as amended and relevant supporting Regulations. The works will also be carried out in accordance with assessments and recommendations of international best practice including the UK Control of Substances Hazardous to Health (COSHH) Regulations 1994. Where fuels, oils and lubes are required to be stowed on boats, suitable containers will be used and stowed to allow ventilation and safe dissipation of any accidental leaked gas and retention of any leaked liquid. No liquid will be discharged into the water at any stage of the work on site. No smoking will be permitted in the vicinity of fuel in storage or when in use.

All geophysical survey works that involve the use of acoustic instrumentation will follow the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (2014) (as outlined in Section 6.1.2 of Attachment 4.3 - Natura Impact Statement (Report ref: MDR1520C-TTI-00-XX-RP-Z-0004)). Although published in 2014, this guidance remains relevant in Ireland and is listed by NPWS as best-practice guidance<sup>1</sup> and it provides the mitigation framework used in underwater-noise risk assessments in Ireland to date. This makes it directly applicable to the SI works, particularly geophysical and geotechnical surveys. Furthermore, the risk minimisation measures proposed in this guidance remain appropriate today as these measures continue to be recommended as mitigation by marine mammal experts.

Measures to be implemented include but are not limited to

- A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms;
- Pre-start monitoring: If marine mammal species are detected within 500m distance of the sound source, seismic survey shall not commence;

<sup>1</sup> [Underwater sound guidance Jan 2014.pdf](#) accessed July 2026

- Periods of peak sensitivity to survey operations for marine mammals will be avoided where possible; and
- Ramp-up Procedures will be used - a controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

#### 2.1.10.6 Access and Egress Arrangements

All offshore works will be carried out from a vessel or JUB. The offshore survey vessel may mobilise directly to site from its base or from a suitable port in the Irish Sea close to the site.

Access to the intertidal zone may be made from the landward side down an existing lane (Legg Lane) at the southern boundary of Dunany Demesne as shown on Figure 2-1.

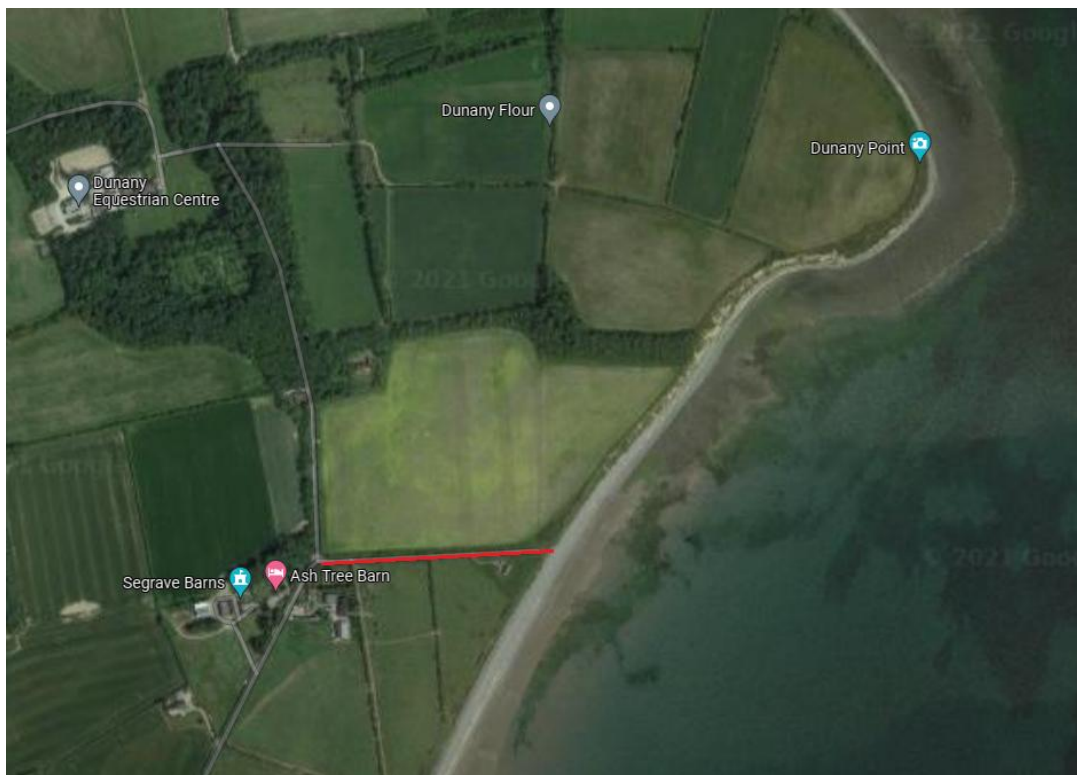


Figure 2-1 Intertidal zone access via Legg Lane

## 3.0 Methodology

### 3.1 Appropriate Assessment Guidance

This Appropriate Assessment Screening Report has been completed in accordance with the EU and national guidance documents that pertain to Member States' fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this Appropriate Assessment Screening Report has complied with the following guidance:

- EC (2000). Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg;
- EC (2002). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC (2007). Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. European Commission;
- DoEHLG (2009a, rev. 2010). Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- EC (2013). Interpretation Manual of European Union Habitats. Version EUR 28. European Commission, Luxembourg;
- EC (2018). European Commission Notice C (2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg;
- OPR (2021). Practice Note PN01: Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin Ireland; and
- EC (2021). European Commission Notice C (2021) 6913 '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', Office for Official Publications of the European Communities, Luxembourg.

### 3.2 Stages of Appropriate Assessment

Appropriate Assessment (AA) is a four-stage process with tests at each stage. The four stages are summarised diagrammatically in Figure 3-1 below. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1-2 deal with the main requirements for assessment under Article 6(3) of the Habitats Directive. Stage 3 is a precursor to Stage 4 which is the main derogation step of Article 6(4).

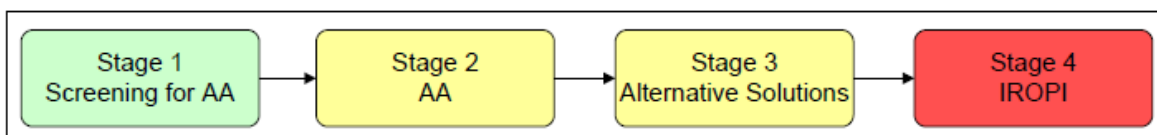


Figure 3-1 Four Stages of Appropriate Assessment

The screening for AA carried out by the competent authority (Stage 1), will determine whether an AA (Stage 2) for this MULA is required. The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a European site in view of the site's conservation objectives.

There is no requirement to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of AA has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether a Stage Two AA must be undertaken by the competent authority on the implications of the proposed development for the conservation objectives of a European site. Therefore, where significant effects are likely, uncertain or unknown at screening stage, a second stage AA will be required

Stage 2 is required if it cannot be excluded, on the basis of the objective information provided at Stage 1, that the SI Works, individually or in combination with other projects or plans, will have a significant effect on a European site, in view of the site's conservation objectives. In this case, a Natura Impact Statement (NIS) must be prepared to assist the competent authority to conduct the Stage 2 AA. Stage 2 AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority of the implications of the plan or project, alone and in-combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an AA, to be lawfully conducted, in summary:

- (i) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
- (ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and
- (iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. 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 three and, if necessary, stage four.

If it is not possible during Stage 2 to avoid adverse effects on the integrity of one or more European sites through avoidance and/or mitigation, Stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. If it can be demonstrated that there are no reasonable alternative solutions, the AA progresses to Stage 4. This final stage is undertaken when it has been determined that negative impacts on the integrity of a European site will result from a plan or project and there are no alternative solutions. At Stage 4 of the AA process, the competent authority must determine if, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, the project must nevertheless be carried out for imperative reasons of overriding public interest, or 'IROPI', including those of a social or economic nature. In such circumstances, the Member State is required to take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected.

While there is no prescribed form or content for reporting (DoEHLG, 2009a) the methodology and format adopted in this report has been in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC, 2021) and the European Commission Guidance 'Managing Natura 2000 sites' (EC, 2018), guidance prepared by the NPWS (DoEHLG, 2009a) and by the Office of the Planning Regulator (OPR, 2021).

As per DoEHLG (2009a):

*The first test is to establish whether, in relation to a particular plan or project, appropriate assessment is required.*

In summary, the test for the screening for AA is to determine on the basis of a preliminary assessment and objective scientific information could there be effects in view of the site's conservation objectives. There is no necessity to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of AA has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded. The threshold at this screening stage is a very low one and operates as a trigger in order to determine whether an AA must be undertaken by the competent authority on the implications of the proposed development for the conservation objectives of a European site. Therefore, where significant effects are likely, uncertain or unknown at screening stage, an AA and NIS will be required.

### 3.3 Stage 1 Screening / Test of Significance

This process identifies whether the proposed development is directly connected to or necessary for the management of a European site(s) and identifies whether likely significant effects upon a European site(s) can be excluded, either alone or in combination with other projects or plans.

The screening for AA will incorporate the following steps:

1. Determining whether a project is directly connected with or necessary to the conservation management of any European sites;
2. Describing the project;
3. Identifying the European sites potentially affected by the project or plan;
4. Identifying and describing any potential effects of the project or plan on European sites, alone, or in combination with other plans/projects; and
5. Assessing the likelihood of significant effects on European sites.

The output from this stage is a determination for each European site(s) of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause that site to be brought forward to Stage 2.

### 3.4 Desk Study

Information on the receiving environment was analysed to determine the potential for significant effects to QIs and Species of Conservation Interest (SCIs) of the European sites with established connectivity to the SI works (see Section 5.3). The following publications and data sources were reviewed in July 2026:

- Information on ranges of mobile QI populations in Volume 1 of NPWS' Status of EU Protected Habitats and Species in Ireland (NPWS, 2025a), and associated digital shapefiles obtained from the NPWS Research Branch;
- BirdWatch Ireland (<https://birdwatchireland.ie/>);
- Mapping of European site boundaries and Conservation Objectives for relevant sites, available online from the NPWS including Site Synopses, European site Data Forms and Conservation Objective Supporting Documents, where available (<https://www.npws.ie/protected-sites>);
- Distribution records for QI of European sites held online by the National Biodiversity Data Centre (NBDCa) (<https://biodiversityireland.ie/>);
- Ordnance Survey of Ireland maps and aerial photography (<https://osi.ie>); and
- EMODnet (2026) Map Viewer. Available at: [EMODnet Map Viewer](#) accessed July 2026.



## 3.5 Identification of Relevant European Sites

### 3.5.1 Source-Pathway Receptor Model

The identification of relevant European sites to be included in this report was based on the identification of the 'zone of influence (Zol)' of the SI works using a Source-Pathway-Receptor (SPR) model where:

- A 'source' is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features, and its COs;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and
- A 'receptor' is defined as a QI of SACs or SPAs for which COs have been set for the European site(s) being assessed.

An SPR model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The SPR model was used to identify a list of European sites, and their QIs, to which the SI works are potentially linked. These are termed as 'relevant' sites/QIs throughout this report.

### 3.5.2 Zone of Influence

Determination of the SI works' Zol was achieved by assessing the SI works against the ecological receptors within the MUL Area, in addition to the ecological receptors that could be connected to and subsequently impacted by the project through abiotic and biotic vectors.

The proximity of the SI works to European sites, and more importantly, QIs and SCIs of the European sites, is of importance when identifying potentially likely significant effects. In accordance with the OPR AA Screening Guidelines (2021), the SPR model has been used to identify the Zol to ensure that relevant European sites are identified. The SPR model minimises the risk of overlooking distant or obscure effect pathways, while also avoiding an over reliance on buffer zones (e.g., 15 km), within which all European sites should be considered. This approach follows the DoEHLG 2009 guidance on AA which states that:

*"For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects" (DoEHLG, 2009a; p.32, para 1).*

The Zol of the SI works on mobile species (e.g., birds, mammals, and fish), and static species and habitats (e.g., saltmarshes, woodlands, and flora) is considered differently. Mobile species have 'range' outside of the European sites in which they are QI. The range of mobile QI species varies considerably, from several metres (e.g., in the case of whorl snails *Vertigo* spp.), to hundreds of kilometres (in the case of migratory wetland birds). A project's Zol may extend well beyond the project boundary and can impact or have an effect on static species and habitats remote from the SI works; for example, where an aquatic QI habitat or plant is located many kilometres downstream from a pollution source. In particular, hydrological linkages between the SI works and European sites (and their QIs) can occur over significant distances; however, any effect will be site-specific depending on the receiving water environment and nature of the potential impact.

To this end, the Zol for this project extends outside of the immediate SI works MUL Area to include ecological receptors connected to the project through proximity and connectivity through features such as watercourses and waterbodies in addition to potential connectivity through land and air. See Section 5.3 for the identification of relevant European sites.

## 4.0 Desk Study

This section details the results of the desk study undertaken to describe the receiving environment of the SI works. The relevant receiving environment relates to anything that may be directly or indirectly related to the QIs/SCIs of the relevant European Sites.

### 4.1 Habitats

The MUL Area spans a large area (17,013 Ha) and covers a range of habitat types, from coastal/ intertidal to subtidal. In order to understand the marine habitat types likely to be encountered, the boundary of the MUL Area was reviewed against EUSeaMap, a broad-scale predictive seabed habitat map for Europe (EMODnet, 2026). A combination of high to low energy infralittoral/circalittoral muddy sand (MB62), sand (MB52), coarse substrate (MB32), sandy mud (MC62) and coarse substrate (MD32) is noted within the offshore cable corridor. While the offshore wind farm area including the 4 km buffer includes areas of moderate to low energy circalittoral rock or hard substrate (MC12/MD12), coarse substrate (MD32/MC32), and sand (MD52).

Site-specific environmental surveys were undertaken for the Oriel Wind Farm Project in 2006 and 2019 (RPS, 2024a). These results are largely consistent with the EMODnet seabed habitats and show that the dominant sediment type in the western Irish Sea is mud and muddy sand. However, from the EMODnet seabed habitat data it would be expected that a higher proportion of boulders and coarse sediment would be found and a lower proportion of mud and silt-clay (RPS, 2024a). EMODnet seabed habitat data indicated that biogenic reef may be present within the offshore wind farm area and offshore cable corridor. However, no evidence of biogenic reef was found during the previous site-specific benthic subtidal surveys (RPS, 2024a). A further survey campaign was commissioned following a request for further information from An Coimisiún Pleanála (ACP) in 2025. This most recent survey found predominantly mixed sediment (primarily composed of sand and mud) based communities in the offshore cable corridor as well as more general mixed and muddy sand biotopes which were also identified in the 2019 survey. In nearshore areas, the seabed habitats were found to be characterised by mixed sediments with a greater number of cobbles and boulders compared to offshore areas. This is consistent with a grading or transition between soft sediment habitats and areas of rocky habitats in inshore areas of the offshore cable corridor (RPS, 2025a).

A standard Phase 1 intertidal walkover survey and dig-over macrofauna sampling was undertaken in October 2019 to characterise the landfall location. The landfall survey area contained a mix of mobile rocky habitat and intertidal sand. A steep and narrow band of shingle was present at the landward end of the beach after which a very shallow slope occurred dominated by intertidal sand/sandflats (RPS, 2024a).

The MUL Area does not overlap any SACs designated for Annex I habitats. The closest SAC designated for marine Annex I habitats is Dundalk Bay SAC (IE000455) located 4 km west of the MUL Area and is designated for estuaries (1130), mudflats and sandflats not covered by seawater at low tide (1140) and *Salicornia* and other annuals colonising mud and sand (1310). Other nearby SAC's designated for Annex I habitats which are above the HWM include Carlingford Shore SAC (IE002306), Carlingford Mountain SAC (IE0004530) and Clogher Head SAC (IE001459) located between 0.5 km and 6 km from the MUL Area. Relevant marine and coastal habitat QIs which occur above the HWM are not deemed to be susceptible to likely significant effects resulting from hydrological connectivity, as no marine, freshwater or groundwater pathway connected with the SI works exists for interaction. As all works will be conducted below the HWM and wholly within the MUL Area, there is no pathway for hydrological connectivity between the proposed SI works and the SAC's listed above.



## 4.2 Species

### 4.2.1 Otter

Otter (*Lutra lutra*) occurs throughout Ireland, including along the east coast, with populations found along rivers, lakes, and coasts, where fish and other prey are abundant, and where the bank-side habitat offers plenty of cover (NPWS, 2025a). They have diverse habitat preferences: lakes, canals, riverine (streams up to major river systems) marshland and estuaries. Otters are a mobile species and maintain territories. In lowland rivers and fish-rich lakes otters only need to maintain small territories (up to 6 km), but along smaller river systems and in upland areas where prey may be less abundant, otter territories can stretch to 20 km (Mullen et al., 2021). Female territories range between  $7.5 \pm 1.5$  km for riverine and  $6.5 \pm 1.0$  km for coastal environments, whereas male territories are approximately  $13.2 \pm 5.3$  km along rivers but with a high degree of variability (Reid et al., 2013). In general, otters exploit a narrow strip of habitat, about 10 m wide at the aquatic-terrestrial interface (Mullen et al., 2021). Otters have been observed foraging up to 80 m from shorelines (NPWS, 2009). Otters are opportunistic predators with a broad and varied diet. In coastal areas fish, crabs and molluscs are eaten (NPWS, 2025a).

A desk-based study utilising records from NBDC (2026b) indicated that otters have been sighted in the last 10 years adjacent to the MUL Area, however none have been recorded within the MUL Area. One live otter sighting was recorded in 2018 at Clogherhead, 7 km south of the MUL Area (NBDC, 2026b). Otter surveys were carried out in 2019, 2021, 2022, 2023 and 2025 as part of the overall Oriel Wind Farm Project. These surveys mainly focused on watercourses, drainage ditches and wetland habitats above the HWM but provide an indication of otter activity within the area. Evidence of otters was only recorded in 2021 and 2025 surveys. In 2021, a single sighting of otter was noted 100 m north of the N33 River Dee crossing, 12 km inland from the MUL Area (RPS, 2024b). In 2025, four otter spraints were found on boulders, immediately downstream of the N33 bridge crossing (same location as 2021 i.e. 12 km inland from the MUL Area), downstream of the Drumcar Bridge in the River Dee (9 km inland from the MUL Area), downstream of the Newhall 06 stream (7 km inland from the MUL Area) and downstream of the Salterstown stream (1 km south of the MUL Area) (RPS, 2025b). It is therefore reasonable to conclude that otters, although rare, may be present within the areas adjacent to the MUL Area.

Impacts to otters can occur as a result of permanent loss of breeding or resting sites, habitat loss, disturbance/displacement and injury or mortality. The main threats to otter in Ireland include pollution, habitat disturbance and accidental deaths, e.g., road traffic (NPWS, 2025b). The most recent Article 17 conservation assessment for otters in Ireland deemed the species as being in favourable conservation status (NPWS, 2025b).

### 4.2.2 Marine Mammals

The Irish Sea supports a great diversity and abundance of marine mammals, including the following species listed on Annex II of the Habitats Directive and which are therefore QIs of certain SACs: harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). The MUL Area does not overlap any SACs designated for Annex II cetacean species.

#### 4.2.2.1 Harbour Porpoise

Harbour porpoise are widely distributed around the Irish coast (Wall et al., 2013). The Celtic and Irish Seas (CIS) MU is recognised for the management of harbour porpoise in the Celtic and Irish Seas (IAMMWG, 2023). Abundance of harbour porpoise in the CIS MU is estimated at 62,517 animals (IAMMWG, 2023). According to Giralt Paradell et al. (2024), mean group sizes of harbour porpoise were notably higher during winter, and the greatest abundance and density estimates were for the Irish Sea (stratum 5) for all seasons. A number of harbour porpoise calves were recorded during the Phase II survey, with a majority of sightings (4 out of 7) within the Irish Sea. According to Giralt Paradell et al., (2024), the data recorded from stratum 5 (Irish Sea) during the summer 2021 and 2022 survey suggests that harbour porpoise occurs along the east coast of

Ireland in densities of between 0.150 to 0.968 animals per km<sup>2</sup>, in winter 2022 in stratum 5 harbour porpoise occurred in densities of 0.413 animals per km<sup>2</sup>. O'Brien and Berrow (2016) stated that harbour porpoise density for the Rockabill to Dalkey Island SAC is estimated to be 1.55±0.17 per km<sup>2</sup> with a population of 424±46 individuals overall, with 95% confidence interval of 335-536.

Boat-based transect observation surveys were conducted as part of the proposed Oriel Wind Farm Project between 2018-2019, during which harbour porpoises were sighted monthly within the offshore wind farm area. During these surveys a total of 689 harbour porpoise were recorded with peak counts of 114 in August 2018 and 105 in January 2019. Between November 2019 and November 2020, static acoustic monitoring (SAM) was undertaken at four locations within the MUL Area (two locations within the offshore wind farm area and two locations within the cable corridor). During these surveys, harbour porpoise were recorded daily within the MUL Area (RPS, 2024c).

The closest SAC to the MUL Area designated for harbour porpoise is the Rockabill to Dalkey Island SAC (IE003000) located 27 km south of the MUL Area. Lambay Island SAC (IE000204) located 39 km south of the MUL Area is also an SAC designated for harbour porpoise while Codling Fault Zone SAC (IE003015) is located 59 km south of the MUL Area. The closest UK SACs designated for harbour porpoise include the North Channel SAC (UK0030399), located 44 km northeast of the MUL Area, the North Anglesey Marine / Gogledd Mrn Forol SAC (UK0030398) located 52 km southeast of the MUL Area.

According to IWDG (2026) there has been 265 sightings of harbour porpoise in the Irish Sea region (between Down and Wexford) between July 2025 and July 2026.

Potential threats to harbour porpoise include underwater noise, entanglement in fishing gear, shipping traffic, and coastal development including ORE and other forms of human disturbance (ORCA, 2026). The most recent Article 17 conservation assessment for harbour porpoise in Ireland deemed the species as being in unfavourable / inadequate conservation status (NPWS, 2025b).

#### 4.2.2.2 Bottlenose Dolphin

Bottlenose dolphins occur off all Irish coasts, with inshore animals moving around the entire Irish coastline and between the UK and Ireland (O'Brien et al., 2009; Robinson et al., 2012). Bottlenose dolphins are one of the most frequently recorded cetaceans in Irish waters. They occur in group sizes between 3-30 individuals in coastal waters, and larger groups of hundreds of individuals in offshore waters. The MUL Area is located within the Irish Sea MU for bottlenose dolphins, where there is an estimated abundance of 293 bottlenose dolphins (IAMMWG, 2023) based on data collected during SCANS III and the ObSERVE surveys (Rogan et al., 2018, Hammond et al., 2021). Phase II of the Irish ObSERVE programme (2021-2023) was published in October 2024 and includes an estimate of abundance for bottlenose dolphin in the Irish Sea during the summer of 2022 at 1,223 (Giralt Paradell et al., 2024).

A desk-based study utilising records from NBDC (2026c) indicated that bottlenose dolphin has not been sighted in the last 10 years within the MUL Area. Between July 2025 and July 2026, the IWDG (2026) holds no records of bottlenose dolphin within the MUL Area but holds 41 records of bottlenose dolphin within the wider Irish Sea region between Down and Wexford. The closest sighting comprised four individuals off Clogher Head in December 2025, approximately 6 km south of the MUL Area. All other bottlenose dolphin sightings for this period occurred at or below Lambay Island Co. Dublin, approximately 42 km from the MUL boundary. Previous research has shown the species to have a high degree of site fidelity amongst Ireland's coastal populations (Nykänen et al., 2018). The nearest EU site designated for bottlenose dolphin in Irish waters is Hook Head SAC, which is 187 km south of the MUL Area, off the south coast of Wexford, while the nearest UK SACs designated for bottlenose dolphin is Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau SAC which is 135 km to the southeast of the MUL Area.

The most recent Article 17 conservation assessment for bottlenose dolphin in Ireland deemed the species as being in favourable conservation status (NPWS, 2025b). However, bottlenose dolphins can be subjected to local and/or regional environmental pressures throughout their range in Irish waters (DoEHLG, 2009b). The main pressures involve commercial shipping-based or vessel-based activities that occur primarily on a local to

regional scale and/or on a temporary to intermittent basis, which includes geophysical seismic exploration (DAHG, 2014).

#### 4.2.2.3 Grey Seal

Grey seal is the larger of the two pinniped species which occur around the Irish coast. They are primarily pelagic or demersal in their feeding habits and can be wide-ranging. In Ireland they are generally considered part of a larger population or meta-population that also inhabits adjacent jurisdictions (i.e. the UK and France) (NPWS, 2025a). The habitat used by grey seals in Ireland is diverse and dynamic, from coastal and estuarine waters close to human activity and undisturbed offshore islands, to deeper Atlantic shelf waters and shallow seas shared with adjacent member states (Cronin et al., 2013). The key prey species for grey seal include a number of clupeids (e.g., herring), gadoids (e.g., cod, whiting), salmon, flatfish, and sand eels.

There are 10 SACs in Ireland for which grey seal is a QI. The nearest EU site designated for grey seal in Irish waters is Lambay Island SAC which is 39 km south of the MUL Area and Saltee Island SAC located off the south coast of Ireland 186 km from the MUL Area. The nearest UK SAC designated for grey seal is Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau SAC which is 135 km to the southeast of the MUL Area.

A desk-based study utilising records from NBDC (2026d) indicated that grey seal have not been sighted within the MUL Area in the last 10 years but has been observed in marine habitats adjacent to the MUL Area. 16 of these observations were recorded in and around Port Oriel and Clogherhead (most recently in December 2025) 6 km south of the MUL Area. Eight observations were reported off Cooley Peninsula (most recently in August 2025) 3 km north of the MUL Area and one in Annagassan (7 km northwest of the MUL Area) in March 2021. Based on tracking data, grey seals typically forage within 100 km of an SAC (Carter et al., 2020). Therefore, it is reasonable to conclude that grey seals are likely to be present within the MUL Area.

Breeding occurs in late August to December and the annual moult is between November to May. Terrestrial habitats used by moulting grey seals around the Irish coastline vary from rocky skerries, island coastlines consisting of rock ledges and outcrops, to sand beaches and sandbanks (Ó'Cadhlá et al., 2007). The closest haul-out sites for harbour seal to the Project are at the mouth of Carlingford Lough (5 km from the MUL Area), Clogherhead (6 km from the MUL Area) and Dundalk Bay (15 km from MUL Area) (Morris and Duck, 2019; RPS 2024c). Another key haul out location is at Lambay Island SAC, 39 km south of the MUL Area, one of the largest on the east coast of Ireland. Between 2009 and 2012, a minimum pup production of 77 pups and a total population size of 270 to 347 was recorded for the east coast population group (Lambay Island and Ireland's Eye) (Ó'Cadhlá et al., 2013). In the eastern survey region, which the MUL Area is located, surveys conducted in 2024 recorded a total grey seal count of 331. This was one fifth lower than in 2017/2018 (Morris & Duck, 2025). During this survey no hauled out seals were recorded within or adjacent to the MUL Area at Dunany Point or Port Beach. The closest recorded haul out site was at Clogherhead 6 km southeast of the MUL Area. Dedicated seal surveys were undertaken between October 2024 and October 2025 in support of the planning application for the Oriel Wind Farm Project. Surveys were undertaken within 500 m of the cable landfall location at Dunany Bay Beach in Co. Louth. No grey seals were recorded hauled out at the landfall location during these surveys (RPS, 2025c).

Grey seal has a 'Favourable' conservation status with an increasing trend in Irish waters (NPWS, 2025b). Grey seals face a range of local and regional environmental pressures and threats in Irish coastal/offshore waters. The main pressures involve commercial vessel-based or shipping-based activities, which include prey removal and/or bycatch from fisheries, and impacts arising from geophysical seismic exploration (NPWS, 2025a). Strong disturbance could result in displacement of seals from an area. Disturbance could cause slight changes in behaviour such as forcing grey seals to travel greater distances than usual to forage. Grey seals are likely to exhibit some tolerance to the effects of disturbance; however, due to the uncertainties associated with this, the species is deemed to have some sensitivity to strong and mild disturbances. Furthermore, disturbances such as these may also cause potential injury to grey seal, such as impacts on both reproduction and survival rates (Bellman et al., 2019).

#### 4.2.2.4 Harbour Seal

Harbour seal is the smaller of the two species of pinniped found in Ireland. They occur in estuarine, coastal, and fully marine areas, and breed in small groups scattered along the coastline. Harbour seals tend to forage within a maximum of 40 or 50 km of their haul-out sites, but most foraging trips tend to be within shorter ranges (Carter et al., 2020). The key prey species for harbour seals are similar to that of grey seal, including clupeids (e.g., herring), gadoids (e.g., cod, whiting), salmon, flatfish, and sand eels.

Harbour seals have been assessed as having a 'Favourable' conservation status in Irish waters and there are 13 SACs in Ireland for which this species is a QI (NPWS, 2025b). These include Lambay Island SAC located 39 km south of the MUL Area. Lambay Island SAC supports regionally significant numbers of harbour seal, which are present year-round. This Annex II species utilises sandbanks within the harbour for breeding and moulting, with at least 47 harbour seal regularly occurring within the site (NPWS, 2024a). The closest haul-out sites for harbour seal to the Project are at the mouth of Carlingford Lough (5 km from the MUL Area), Clogherhead (6 km from the MUL Area) and Dundalk Bay (15 km from MUL Area) (Morris and Duck, 2019; RPS, 2024c). A desk-based study utilising records from NBDC (2026e) indicated that while harbour seals were not recorded within the MUL Area, they have been sighted in the last 10 years (July 2016 to July 2026) in the marine habitats adjacent to the MUL Area at Cooley Peninsula, Dundalk Bay and the Boyne Estuary. As harbour seals typically forage within 50 km of haul-out sites it is reasonable to conclude that this species is likely to be present within the MUL Area.

Harbour seal pupping occurs during the summer months, primarily in June and July (Arso Civil et al., 2018). Moulting most frequently occurs during August following pupping, although seals in active moult have been observed in southwest Ireland from June to November (Cronin et al., 2013; SCOS, 2021). Outside of the breeding season, seals will exhibit a wider spatial variation. Of the few pup counts that have been undertaken for harbour seals in the Republic of Ireland, the data presented in these is now outdated, therefore they have not been presented in the current desk study. Morris & Duck (2025) reported on the number and distribution of hauled-out harbour seals in 2024, with 247 harbour seals recorded in total in the eastern region (within which the MUL Area is located), approximately double what had been recorded during the 2017/2018 aerial surveys. The closest harbour seal haul out location recorded was at Clogher Head approximately 6 km southeast of the MUL Area. Dedicated seal surveys were undertaken between October 2024 and October 2025 in support of the planning application for the Oriel Wind Farm Project. Surveys were undertaken within 500 m of the cable landfall location at Dunany Bay Beach in Co. Louth. No harbour seals were recorded hauled out at the landfall location during these surveys (RPS, 2025c).

Harbour seals are at risk of similar disturbance and threats to grey seals. These include prey removal, by-catch in fisheries, geophysical seismic exploration, as well as coastal tourism and localised human disturbance at haul-out sites. Strong disturbance could result in displacement of harbour seals from an area, changes in behaviour, reduced reproduction rates, and mortality (Bellman et al., 2019).

### 4.2.3 Migratory Fish species

Annex II diadromous fish species (which migrate between the sea and fresh water) have the potential to pass through the MUL Area during certain times in their life cycle, including river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*), Atlantic salmon (*Salmo salar*) and twaite shad (*Alosa fallax*). For the above species, this may occur only during upstream or downstream migrations to and from spawning grounds. Twaite shad, Atlantic salmon, sea and river lamprey are protected under EU legislation via Annex II of the Habitats Directive, with salmon offered protection under Annex II when in freshwater only. The River Boyne and River Blackwater SAC (NPWS, 2014a) is the only SAC on the east coast of Ireland which is designated for migratory fish species river lamprey and salmon and is located 15 km south of the MUL Area. The next nearest SAC designated for migratory fish species is the Slaney River Valley SAC (IE000781) (NPWS, 2015a) which is located to the southeast of Ireland 96 km away and it is not considered likely that fish from such a distant site would migrate through the MUL Area.



The marine migration routes of Atlantic salmon around Ireland were published in a study which Inland Fisheries Ireland contributed to (Rikardsen et al., 2021). This study tagged 204 salmon kelts with satellite tags from seven European countries and tracked them during their oceanic migration. As can be seen on the extract below, the Irish Sea was not identified as a migration route for tagged salmon.

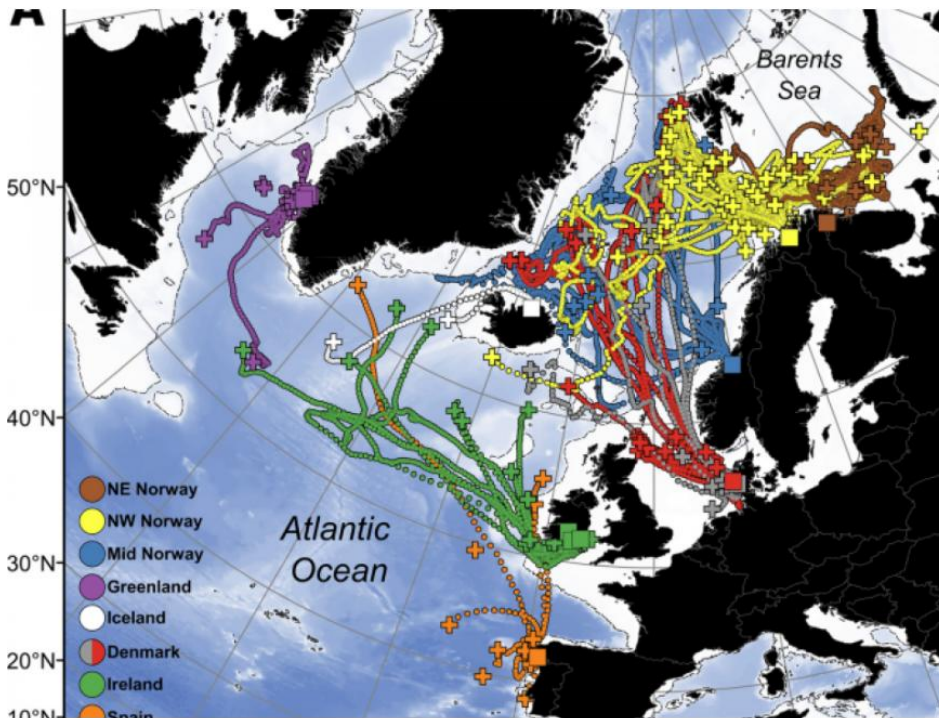


Figure 4-1 Map of migration routes of tagged Atlantic salmon (Rikardsen et al., 2021).

## 4.2.4 Birds

### 4.2.4.1 Seabirds

Aerial surveys undertaken from 2021 to 2023 under Phase II of the ObSERVE Programme recorded 20 species or species groups of seabirds in Irish waters (Giralt Paradell et al., 2024). The inshore/coastal waters of the Irish Sea were noted as of importance in both summer and winter as the greatest overall density of seabirds nationally was identified in this area. Records were dominated by auk species, northern gannet (*Morus bassanus*), northern fulmar (*Fulmarus glacialis*), kittiwake (*Rissa tridactyla*) and Manx shearwater (*Puffinus puffinus*) (Giralt Paradell et al., 2024). Some species such as shearwaters, terns and storm petrels (*Hydrobates pelagicus*) were mainly recorded during the summer surveys. Coastal waters for seabirds were noted as particularly important throughout the year and the survey highlighted hotspots during the summer off the south and southwest coast of Ireland, while during the autumn seabird densities were higher off the southwest coast and further offshore (Giralt Paradell et al., 2024).

Site-specific surveys were carried out as part of the proposed Oriel Wind Farm Project which comprised of surveys across the offshore wind farm area and a buffer extending between approximately 3.6 km to 12.7 km around it. Surveys in this area included boat-based transect surveys between 2018 – 2020, followed by digital aerial surveys flown over the same transects during a six-month period (spring-summer) in 2020. A desk top study was also undertaken to examine data sources for the wider area, providing contextual information about seabird densities within the Irish Sea, as well as providing details about regional breeding and non-breeding populations (RPS, 2024d).

The desk-top study and site-specific data carried out for the proposed Oriel Wind Farm Project determined the key bird species in the study area as: Manx shearwater, gannet, kittiwake, guillemot, razorbill, great northern diver, common gull, great black-backed gull and herring gull with their populations varying seasonally. These species are all protected in Irish waters through designation within a number of Special Protection Areas

(SPAs) (RPS, 2024e). A total of 31 bird species were recorded during the surveys undertaken between May 2018 and September 2020.

The MUL Area overlaps the boundaries of the following SPA, designated for foraging seabirds:

- North-west Irish Sea SPA

The North-west Irish Sea SPA (IE004236) is an important resource for marine birds. This SPA spans from intertidal coastal zones out to offshore Irish Sea and is ecologically connected to other SPAs in the area. The estuaries and bays that open into it along with connecting coastal stretches of intertidal and shallow subtidal habitats, provide safe feeding and roosting habitats for waterbirds throughout the winter and migration periods. These areas, along with more pelagic marine waters further offshore, provide additional supporting habitats (for foraging and other maintenance behaviours) for those seabirds that breed at colonies on the North-west Irish Sea's islands and coastal headlands. These marine areas are also important for seabirds outside the breeding period (NPWS, 2023a).

#### 4.2.4.2 Migratory Waders and Geese

The MUL Area does not overlap any SPA designated for wintering waders or geese. The MUL Area is located 0.3 km to the southwest and west of Dundalk Bay SPA (IE004026). The SPA is an area of extensive mudflats and saltmarshes that has a rich diversity and abundance of molluscs, marine worms and crustaceans (NPWS, 2014b). This site is one of the most important wintering waterfowl sites in Ireland and regularly supports assemblages of over 20,000 wintering waterfowl. At night the site is used for roosting by wintering greylag goose (*Anser anser*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and whooper swan (*Cygnus cygnus*) from other inland sites. Dundalk Bay SPA has 23 species of bird designated as SCI's and also contains QI wetlands and waterbirds (NPWS, 2014b).

Carlingford Lough SPA is comprised primarily of intertidal sandflats and mudflats and SCIs include light-bellied brent goose (*Branta bernicla hrota*), and the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds (NPWS, 2011). Located 4 km north of the MUL Area, the site supports a locally important population of wintering light-bellied brent goose, and several other species of waterfowl can be found at the site including wigeon (*Mareca penelope*), oystercatcher, dunlin, bar-tailed godwit and more (NPWS, 2011).

Boyne Estuary SPA is an estuarine and riverine site that comprises intertidal flats, fine sands and muds, and saltmarshes and is located 12 km from the MUL Area. At least one species of eelgrass (*Zostera* spp.) is located within the estuary along with salt marshes (primarily the Atlantic type) comprised of sea-purslane (*Halimione portulacoides*), common saltmarsh-grass (*Puccinellia maritima*) and sea plantain (*Plantago maritima*) (NPWS, 2015b). The site is a SPA of special conservation interest for the following species: shelduck, oystercatcher, golden plover (*Pluvialis apricaria*), grey plover, lapwing, knot, sanderling (*Calidris alba*), black-tailed godwit, redshank, turnstone (*Arenaria interpres*) and little tern (*Sternula albifrons*). Bar-tailed godwit occur at this site in internationally important numbers as well as a further nine species of wintering waterbird populations of national importance. Little tern have bred at this location since 1994, although yearly variations in fledgling success have been recorded (NPWS, 2015b).

Stabannan-Braganstown SPA is an inland alluvial plain located 13 km west of the MUL Area. The site is a SPA of special conservation interest for greylag goose (NPWS, 2010a). An internationally important wintering population of greylag goose is found at the site, although a decreasing population abundance has been observed in recent years. The site also supports smaller populations of Greenland white-fronted goose (24) and whooper swan (60). Most of these species' roost at ex-situ locations overnight (including at Dundalk Bay SPA) (NPWS, 2010a).

River Nanny Estuary and Shore SPA comprises freshwater marsh / grass wetland and estuarine saltmarsh habitat, as well as exposed bay cliffs that provide high tide roosts for bird species, located 18 km south of the MUL Area (NPWS, 2015c). This site is of special conservation interest for the following species: oystercatcher, ringed plover, golden plover, knot, sanderling and herring gull. The site and its associated waterbirds are of special conservation interest for wetland & waterbirds. The site is of ornithological



importance, supporting five species of wintering waterbirds and one nationally important population of gull species. The site is important for both roosting and feeding birds (NPWS, 2015c).

River Boyne and River Blackwater SPA, located 18 km south of the MUL Area, is of special conservation interest for kingfisher (*Alcedo atthis*) and comprises part of the Boyne and Blackwater River channels and marginal vegetation (NPWS, 2010b). The population of kingfisher at this site is of national importance (19 pairs as of 2010 surveys). Other species which occur within the site include mute swan (*Cygnus olor*) (90), teal (166), mallard (219), cormorant (*Phalacrocorax carbo*) (36), grey heron (*Ardea cinerea*) (44), moorhen (*Gallinula chloropus*) (84), snipe (*Gallinago gallinago*) (32) and sand martin (*Riparia riparia*) (553) (NPWS, 2010b).

## 5.0 Identification of Relevant European Sites

### 5.1 Assessment of Connectivity

Connectivity is identified via the SPR model which identifies the potential impact pathways such as land, air, hydrological pathways etc. which may support direct or indirect connectivity between the SI works (source) and European sites and their QIs or SCIs (receptors).

Where it is evident that there is no connectivity between the SI work and receptors (i.e., European sites and/or habitats and species for which the sites are selected), the receptors are excluded from the AA process. Where connectivity exists between the SI works and receptors, these receptors are taken forward to the assessment of likely significant effects (Section 6.2).

When assessing impact, the QI and SCI habitats and species are only considered receptors where a credible or tangible SPR link exists between the SI works and the receptor. In order for an impact to occur there must be a risk initiated by having a 'source' - the origin of potential impacts (e.g., near stream construction works), an impact pathway - the means by which the effect reaches the receptor (air, water, or ground) between the source and the receptor (e.g., a watercourse which connects the development site to the site designated for the protection of a receptor) and a 'receptor' (e.g. a protected species associated aquatic or riparian habitats). If the source, pathway, or receptor is absent, no linkage exists and thus, there will be no potential for an impact to be transmitted.

### 5.2 Source-Pathway-Receptor Assessment

#### 5.2.1 Sources of Impact

Identification of a risk of impact does not constitute a prediction that it will occur or, in the event that it does occur, that there is an intrinsic likelihood that it will result in ecological or environmental damage or that it will cause or create a significant effect on the European sites in question. The level and significance of the effect depend upon the magnitude, duration or intensity of the impacts ensuing from the proposal and the existence of a credible or tangible SPR link between the SI works and the aforementioned European sites. It is also determined by the extent of the exposure to the risk and the characteristics of the receptor.

#### 5.2.2 Impacts Scoped Out of Assessment

**Accidental pollution event:** All vessels operating in the marine environment must adhere to the International Convention for the Prevention of Pollution from Ships (MARPOL) which is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Sea Pollution Act, 1991 ratified MARPOL in Ireland. In addition, all substances handled and/or used whilst undertaking the works are required to be handled, used, stored, and documented in accordance with assessments and the Chemicals Act 2008 (No. 13 of 2008) and Chemicals (Amendment) Act 2010 (No. 32 of 2010) and associated Regulations.

Given the standard legal and regulatory pollution control requirements that apply to all vessels, the nature of the proposed SI works, their limited scale and duration, and the insignificant increase in vessel activity, it can be excluded on the basis of objective evidence that an accidental pollution will cause, either individually or in combination with any other plans or projects, a likely significant effect on any European Site. Therefore, this effect is not considered further in this assessment.

**Introduction of invasive alien species:** The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, entered into force globally on 8 September 2017. It is a treaty, adopted by the International Maritime Organization (IMO) in order to help prevent the spread of potentially

harmful aquatic organisms and pathogens in ships' ballast water, including invasive species<sup>2</sup>. The Sea Pollution (Miscellaneous Provisions) Act 2006 gives effect to a number of internationally agreed instruments including the International Convention on Ballast Water Management 2004. The Convention stipulates that ships must manage their ballast water so that aquatic organisms and pathogens are removed or rendered harmless before the ballast water is released into a new location.

All vessels used as part of the SI works will take actions to prevent the spread of invasive alien species as part of their standard operating procedures. Therefore, it can be excluded on the basis of objective evidence that invasive alien species will be introduced by the SI works and thereby cause, either individually or in combination with any other plans or projects, a likely significant effect on any European Site. Therefore, this effect is not considered further in this assessment.

### 5.2.3 Impacts Scoped in for Assessment

Table 5-1 identifies the potential impacts arising from the SI works, the element of SI works associated with each impact, a description of effect pathway and the receptors with the potential to be affected. This assessment will then be used to identify relevant European sites and QIs and SCIs to be taken forward to the Stage 1 Screening for AA. Identification of relevant European sites and QIs is presented in Section 5.3, with Table 5-2 summarising all sites taken forward for screening.

Table 5-1 Source-Pathway-Receptor Assessment for the SI Works

| Impact                                                                                                                         | Potential source of impact                                                                                                                                                                                                                                                                                                               | Description of Effect Pathway                                                                                                                                                                                                                                                                                                                      | Relevant Receptors                                  |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Above water noise, vibration and lighting                                                                                      | Presence of vessel and general non-survey vessel activity. Human presence and use of equipment during intertidal surveys at potential landfall locations.                                                                                                                                                                                | Potential for disturbance to species, leading to displacement from the area.                                                                                                                                                                                                                                                                       | Marine mammals, otter, birds                        |
| Habitat loss, alteration and/ or fragmentation (including smothering due to increased suspended sediment concentrations (SSC)) | Intrusive sampling methods which remove or interact with seabed habitats, including geotechnical borehole drilling, vibrocore sampling, environmental grab sampling, intertidal borehole/trial pit/dig over sampling and survey methods requiring interaction with the seabed (i.e. mooring of ADCPs and underwater acoustic recorders). | Potential for direct loss of and/or damage to habitats and potential to indirectly affect species that rely on those habitats for feeding and/or breeding. Potential for sediments disturbed by intrusive sampling methods to smother sensitive habitats and to indirectly affect species that rely on those habitats for feeding and/or breeding. | Marine mammals, otter, migratory fish, birds        |
| Underwater noise                                                                                                               | Underwater noise emissions from geophysical survey (MBES, SSS, SBP, UHRS, magnetometer, USBL, seismic refraction), geotechnical survey (borehole drilling and vibrocores), vessel activity.                                                                                                                                              | Potential for direct effects (including injury, disturbance and/or displacement) on mobile species with hearing abilities.                                                                                                                                                                                                                         | Marine mammals, otter, migratory fish, diving birds |
| Risk of collision                                                                                                              | Vessel activity and equipment associated with the geophysical, geotechnical and environmental surveys.                                                                                                                                                                                                                                   | Potential for collision of vessel and/or equipment with species in the marine environment.                                                                                                                                                                                                                                                         | Marine mammals                                      |

## 5.3 Identification of relevant European sites

<sup>2</sup> <https://invasives.ie/about/legislation-policy/> - Accessed July 2026

The following sections detail the identification of relevant European sites for consideration in the Stage 1 Screening for AA. Each section describes the rationale for site selection, which is based on a SPR model of assessment. As outlined in Section 1.4.2.4, the term ‘European sites’ includes SACs, candidate SACs, SPAs and candidate SPAs, and as such, all designated and candidate European sites are considered in the following assessment.

European sites identified within the overall Zol of the SI works, their respective relevant QI/ SCI, and a measure of the distance of the European site from the MUL Area are detailed in Table 5-2, below. Figure 1-1 shows the location of the SI works relative to these European sites.

### 5.3.1 Annex I Habitats

The European sites with relevant Annex I habitat QIs to be considered in this Appropriate Assessment Screening Report are:

- All European sites that physically overlap with the MUL Area. It is noted that intrusive sampling methods will only directly affect a relatively small portion of the overall MUL Area, however, as a conservative measure, and to allow for flexibility in sampling locations, the entire area of the MUL Area is assessed for potential impacts; and
- All European sites within the Zol of impacts and where a SPR link exists, as assessed in section 5.2. All direct impacts to Annex I habitats (subtidal and intertidal) will be limited to the proposed survey area. The proposed intrusive sampling techniques are limited to discrete sampling locations and undertaken individually over the course of a survey campaign. Therefore, the SI works will not mobilise large volumes of sediment or plumes. Therefore, SACs with Annex I habitats which directly border the MUL Area will be considered, however, there is no pathway for impact with Annex I habitat SACs further away from the MUL Area.

As stated above in Section 4.1, the MUL Area does not overlap any SAC's designated for marine Annex I habitats. The closest SACs designated for marine Annex I habitats is Dundalk Bay SAC located 4 km west of the MUL Area. As there will be no intrusive/extractive sampling associated with the SI works within the Dundalk Bay SAC there is no potential for impacts to the QIs of the SAC. Therefore, there will be no interaction with the Annex I habitats of Dundalk Bay SAC and the proposed SI works, therefore this SAC is not assessed in this Appropriate Assessment Screening Report.

Other nearby SAC's which are designated for Annex I coastal and terrestrial habitats but do not overlap the MUL Area include Carlingford Shore SAC, Carlingford Mountain SAC and Clogher Head SAC between 0.5 km and 6 km from the MUL Area. There is no SPR link between the proposed SI works and these SACs. Therefore, no SAC with Annex I habitat QIs will be assessed further in this Appropriate Assessment Screening Report.

### 5.3.2 Annex II Otter

The European sites with relevant Annex II otter QIs to be considered in this Appropriate Assessment Screening Report are:

- All European sites that physically overlap with the MUL Area; and,
- All European sites that have otter as a QI that have a realistic potential for connectivity with the MUL Area. While otter is a mobile species, individuals have defined territories. Female territories range between  $7.5 \pm 1.5$  km for riverine and  $6.5 \pm 1.0$  km for coastal environments where male territories are approximately  $13.2 \pm 5.3$  km along rivers but with a high degree of variability (Reid et al., 2013). In lowland rivers and fish-rich lakes otters only need to maintain small territories (up to 6 km), but along smaller river systems and in upland areas where prey may be less abundant, otter territories can stretch to 20 km (Mullen et al., 2021). Otter activity has been recorded in the adjacent areas of the MUL Area downstream of nearby river courses (see Section 4.2.1), therefore a precautionary

approach to the identification of relevant sites has been adopted, which has considered European sites designated for otter within 20 km of the MUL Area.

The sites selected for consideration of otter QIs in this Appropriate Assessment Screening Report are listed below and outlined in Table 5-2:

- River Boyne and River Blackwater SAC

### 5.3.3 Annex II Marine Mammals

The European sites with relevant Annex II marine mammal QIs to be considered in this Appropriate Assessment Screening Report are:

- All European sites that physically overlap with the MUL Area; and,
- All European sites that have marine mammal QIs with a realistic potential for connectivity with the MUL Area. A conservative approach has been adopted which has considered all sites within a 100 km buffer of the MUL Area. This buffer is considered over-precautionary with respect to capturing the Zol of underwater noise impacts associated with the proposed surveys, however, it allows for the possibility that marine mammals from distant SACs may be foraging or passing through the survey area.

While it is documented that grey seals can forage hundreds of kilometres from their breeding sides (Cronin et al., 2011; Russell & McConnell, 2014), and harbour seals may travel up to 100 km, this is dependent on seasonality, habitat preference and animal maturity. For the present assessment it is considered sufficiently precautionary to apply a 100 km buffer for the identification of grey and harbour seal SACs. Beyond this distance, there is no realistic SPR link which may have implications for the conservation objectives of more distant European sites (e.g. ability of these species to access habitats within these sites, effects on the natural range of the population etc.).

JNCC management units (MU) refer to geographical areas in which the animals of a particular cetacean species are found, to which management of human activities is applied (IAMMWG, 2023). It is noted that MUs are not estimates of populations, and that almost all species of cetacean are part of larger biological populations. The MU boundary is based on the best understanding of the population structure of species, taking into account jurisdictional boundaries and divisions already used for the management of human activities. According to IAMMWG (2023), MUs may be subdivided to provide advice on a smaller spatial scale for a given purpose. Considering the vast scale of the relevant MUs for these species, it is considered that including all harbour porpoise and bottlenose dolphin SACs within the JNCC MU boundaries would result in an overly precautionary assessment. Therefore, 100 km was identified as suitably precautionary Zol to consider all potential marine mammal SACs which have the potential to be impacted by the proposed SI works.

In summary, a suitably precautionary approach to the identification of relevant sites has been adopted, which has considered European sites designated for Annex II marine mammals within 100 km of the MUL Area.

The sites selected for consideration of marine mammal QIs in this Appropriate Assessment Screening Report are listed below and outlined in Table 5-2:

- Rockabill to Dalkey Island SAC;
- Lambay Island SAC;
- Codling Fault Zone SAC;
- Slaney River Valley SAC;
- Strangford Lough SAC (Northern Ireland);
- Murlough SAC (Northern Ireland);

- North Channel SAC (Northern Ireland); and
- North Anglesey Marine / Gogledd Mrn Forol SAC (Wales).

### 5.3.4 Annex II Migratory Fish

The European sites with relevant Annex II migratory fish QIs to be considered in this Appropriate Assessment Screening Report are:

- All European sites that physically overlap with the MUL Area; and,
- All European sites that have migratory fish as a QI that have a realistic potential for connectivity with the MUL Area. A precautionary approach to the identification of relevant sites has been adopted which considers all European sites within a 50 km buffer of the MUL Area. It should be noted that this buffer is considered to be over precautionary with respect to capturing the ZoI of impacts (e.g. underwater noise) associated with the proposed surveys on the basis of the typically small ranges of effects on fish resulting from geophysical/ geotechnical surveys, however, it allows for the possibility that migratory fish from nearby SACs may be passing through the survey area. There is, therefore, considered to be no realistic SPR link which may have implications for the conservation objectives of the European sites beyond this range (e.g. ability of these species to access habitats within these sites, effects on the natural range of the population etc).

The sites selected for consideration of migratory fish QIs in this Appropriate Assessment Screening Report are listed below and outlined in Table 5-2:

- River Boyne and River Blackwater SAC

### 5.3.5 Birds

The European sites with relevant bird SCIs to be considered in this Appropriate Assessment Screening Report are:

- All European sites that physically overlap with the MUL Area; and,
- All European sites that have bird species as a SCI that have a realistic potential for connectivity with the MUL Area. Seabirds can forage considerable distances from their colonies with species such as Manx shearwater, storm petrel, gannet and fulmar capable of foraging hundreds of kilometres away (Woodward et al., 2019). Given the limited size, scale and duration of the SI works within the context of these extensive foraging ranges, seabirds from distant SPAs will not be foraging within the MUL Area in numbers that would lead to implications to the conservation objectives of those sites (e.g. the ability of these species to access habitats within these sites, effects on the natural range of the population etc). Many wintering SCI waterbird species travel outside of their designated habitats to forage. Wintering swan and goose species can have foraging ranges of up to 20 km from their night roosts (SNH, 2016). Given this ex-situ potential, it is possible that wintering birds occurring in the vicinity of the intertidal SI works are associated with SPAs located up to 20 km away. As a precautionary measure, all SPAs within 20 km of the MUL Area boundary have been considered for screening.

The sites selected for consideration of bird species SCI in this Appropriate Assessment Screening Report are listed below and considered further in Table 5-2:

- North-west Irish Sea SPA;
- Dundalk Bay SPA;
- Carlingford Lough SPA;
- Boyne Estuary SPA;



- Stabannan-Braganstown SPA;
- River Nanny Estuary and Shore SPA; and
- River Boyne and River Blackwater SPA.

Table 5-2 Relevant European Sites and Qualifying Interests to be Considered in Stage 1 Screening for Likely Significant Effects

| European Site (Code)                | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Connections (Source-Pathway Receptors)                                                                         |
|-------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| North-west Irish Sea SPA (IE004236) | Within SAC boundary    | Red-throated diver ( <i>Gavia stellata</i> ) [A001]<br>Great northern diver ( <i>Gavia immer</i> ) [A003]<br>Fulmar ( <i>Fulmarus glacialis</i> ) [A009]<br>Manx shearwater ( <i>Puffinus puffinus</i> ) [A013]<br>Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]<br>Shag ( <i>Phalacrocorax aristotelis</i> ) [A018]<br>Common scoter ( <i>Melanitta nigra</i> ) [A065]<br>Black-headed gull ( <i>Chroicocephalus ridibundus</i> ) [A179]<br>Common gull ( <i>Larus canus</i> ) [A182]<br>Lesser black-backed gull ( <i>Larus fuscus</i> ) [A183]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Great black-backed gull ( <i>Larus marinus</i> ) [A187]<br>Kittiwake ( <i>Rissa tridactyla</i> ) [A188]<br>Roseate tern ( <i>Sterna dougallii</i> ) [A192]<br>Common tern ( <i>Sterna hirundo</i> ) [A193]<br>Arctic tern ( <i>Sterna paradisaea</i> ) [A194]<br>Guillemot ( <i>Uria aalge</i> ) [A199]<br>Razorbill ( <i>Alca torda</i> ) [A200]<br>Puffin ( <i>Fratercula arctica</i> ) [A204]<br>Little gull ( <i>Hydrocoloeus minutus</i> ) [A862]<br>Little tern ( <i>Sternula albifrons</i> ) [A885] | Yes. MUL Area overlaps with SPA boundary, and therefore there is potential for SCI bird species to be present. |
| Dundalk Bay SPA (IE004026)          | 0.3                    | Great crested grebe ( <i>Podiceps cristatus</i> ) [A005]<br>Greylag goose ( <i>Anser anser</i> ) [A043]<br>Light-bellied brent goose ( <i>Branta bernicla hrota</i> ) [A046]<br>Shelduck ( <i>Tadorna tadorna</i> ) [A048]<br>Teal ( <i>Anas crecca</i> ) [A052]<br>Mallard ( <i>Anas platyrhynchos</i> ) [A053]<br>Pintail ( <i>Anas acuta</i> ) [A054]<br>Common scoter ( <i>Melanitta nigra</i> ) [A065]<br>Red-breasted merganser ( <i>Mergus serrator</i> ) [A069]<br>Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes. Potential SPR connection as SPA is within 20km of MUL Area.                                               |

<sup>3</sup> Qualifying interests that have not been identified as relevant to this assessment are greyed out.

## Oriel Wind Farm Project

| European Site (Code)                 | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Connections (Source-Pathway Receptors)                                                                        |
|--------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|                                      |                        | Ringed plover ( <i>Charadrius hiaticula</i> ) [A137]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Grey plover ( <i>Pluvialis squatarola</i> ) [A141]<br>Lapwing ( <i>Vanellus vanellus</i> ) [A142]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Dunlin ( <i>Calidris alpina</i> ) [A149]<br>Black-tailed godwit ( <i>Limosa limosa</i> ) [A156]<br>Bar-tailed godwit ( <i>Limosa lapponica</i> ) [A157]<br>Curlew ( <i>Numenius arquata</i> ) [A160]<br>Redshank ( <i>Tringa totanus</i> ) [A162]<br>Black-headed gull ( <i>Chroicocephalus ridibundus</i> ) [A179]<br>Common gull ( <i>Larus canus</i> ) [A182]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Wetland and waterbirds [A999] |                                                                                                               |
| Carlingford Lough SPA (IE004078)     | 4                      | Light-bellied brent goose ( <i>Branta bernicla hrota</i> ) [A046]<br>Wetland and waterbirds [A999]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes. Potential SPR connection as SPA is within 20km of MUL Area.                                              |
| Boyne Estuary SPA (IE004080)         | 12                     | Shelduck ( <i>Tadorna tadorna</i> ) [A048]<br>Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Grey plover ( <i>Pluvialis squatarola</i> ) [A141]<br>Lapwing ( <i>Vanellus vanellus</i> ) [A142]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Sanderling ( <i>Calidris alba</i> ) [A144]<br>Black-tailed godwit ( <i>Limosa limosa</i> ) [A156]<br>Redshank ( <i>Tringa totanus</i> ) [A162]<br>Turnstone ( <i>Arenaria interpres</i> ) [A169]<br>Little tern ( <i>Sternula albifrons</i> ) [A885]<br>Wetland and waterbirds [A999]                                                                                                                 | Yes. Potential SPR connection as SPA is within 20km of MUL Area.                                              |
| Stabannan-Braganstown SPA (IE004091) | 13                     | Greylag goose ( <i>Anser anser</i> ) [A043]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yes. Potential SPR connection as SPA is within 20km of MUL Area.                                              |
|                                      | 15 km                  | Otter ( <i>Lutra lutra</i> ) [1355]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes. Potential SPR connection to QI otter as River Boyne and River Blackwater SAC is within 20km of MUL Area. |

## Oriel Wind Farm Project

| European Site (Code)                            | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                                                                                                                                                                                                                                                                | Connections (Source-Pathway Receptors)                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| River Boyne and River Blackwater SAC (IE002299) |                        | Salmon ( <i>Salmo salar</i> ) [1106]                                                                                                                                                                                                                                                                                                              | Yes. Potential SPR connection to salmon as River Boyne and River Blackwater SAC is within 50km of MUL Area. There is potential for QI salmon to pass through the MUL Area during certain times in their life cycle.                                                                                                                                                                                                               |
|                                                 |                        | River lamprey ( <i>Lampetra fluviatilis</i> ) [1099]                                                                                                                                                                                                                                                                                              | Yes. Potential SPR connection to QI river lamprey as River Boyne and River Blackwater SAC is within 50km of MUL Area. There is potential for QI river lamprey to pass through the MUL Area during certain times in their life cycle.                                                                                                                                                                                              |
|                                                 |                        | Alkaline fens [7230]                                                                                                                                                                                                                                                                                                                              | No SPR connection to Alkaline fens, this QI is located above the HWM and therefore there is no potential for hydrological connectivity.                                                                                                                                                                                                                                                                                           |
|                                                 |                        | Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]                                                                                                                                                                                          | No SPR connection to Alluvial forests as this habitat is mapped 5 km upstream of the Boyne Estuary therefore there is no potential for connectivity with the SI works.                                                                                                                                                                                                                                                            |
| River Nanny Estuary and Shore SPA (IE004158)    | 18                     | Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]<br>Ringed plover ( <i>Charadrius hiaticula</i> ) [A137]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Sanderling ( <i>Calidris alba</i> ) [A144]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Wetland and waterbirds [A999] | Yes. Potential SPR connection as SPA is within 20km of MUL Area.                                                                                                                                                                                                                                                                                                                                                                  |
| River Boyne and River Blackwater SPA (IE004232) | 18                     | Kingfisher ( <i>Alcedo atthis</i> ) [A229]                                                                                                                                                                                                                                                                                                        | No. Kingfishers are sedentary, rarely moving from their territories during the winter season while during the breeding season they breed in tunnels dug in vertical banks along streams and rivers (Birdwatch Ireland, 2026). As the MUL Area is over 18 km away and does not overlap any suitable habitat for kingfisher i.e., rivers or streams. It is unlikely to be present within the MUL Area during the proposed SI works. |
| Murlough SAC (UK0016612)                        | 18                     | Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) [2150]                                                                                                                                                                                                                                                                               | No SPR connection to Atlantic decalcified fixed dunes as dune habitats are located above the HWM in the supratidal zone and therefore will not overlap with the proposed SI works (Chawchai, 2022).                                                                                                                                                                                                                               |

## Oriel Wind Farm Project

| European Site (Code)                      | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                         | Connections (Source-Pathway Receptors)                                                                                                                                                                                 |
|-------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                        | Fixed dunes with herbaceous vegetation ("grey dunes") [2130]                                               | No SPR connection to Fixed dunes with herbaceous vegetation as dune habitats are located above the HWM in the supratidal zone and therefore will not overlap with the proposed SI works (Chawchai, 2022).              |
|                                           |                        | Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]                                   | No SPR connection to Atlantic salt meadows as this habitat is located within Dundrum Bay 18 km north of the MUL area.                                                                                                  |
|                                           |                        | Dunes with <i>Salix repens</i> ssp. <i>argentea</i> ( <i>Salicion arenariae</i> ) [2170]                   | No SPR connection to Dunes with <i>Salix repens</i> ssp. <i>argentea</i> as dune habitats are located above the HWM in the supratidal zone and therefore will not overlap with the proposed SI works (Chawchai, 2022). |
|                                           |                        | Embryonic shifting dunes [2110]                                                                            | No SPR connection to QI Embryonic shifting dunes as dune habitats are located above the HWM in the supratidal zone and therefore will not overlap with the proposed SI works (Chawchai, 2022).                         |
|                                           |                        | Marsh fritillary butterfly <i>Euphydryas</i> ( <i>Eurodryas</i> , <i>Hypodryas</i> ) <i>aurinia</i> [1065] | No SPR connection to Marsh fritillary butterfly as Murlough SAC is located 18 km north of the MUL area.                                                                                                                |
|                                           |                        | Mudflats and sandflats not covered by seawater at low tide [1140]                                          | No SPR connection to Mudflats and sandflats not covered by seawater at low tide as this habitat is located 18 km north of the MUL area.                                                                                |
|                                           |                        | Harbour seal ( <i>Phoca vitulina</i> ) [1365]                                                              | Yes. Potential SPR connection to QI harbour seal as Murlough SAC is within 100 km of MUL Area.                                                                                                                         |
|                                           |                        | Sandbanks which are slightly covered by sea water all the time [1170]                                      | No SPR connection to sandbanks which are slightly covered by sea water all the time as this habitat is located 18 km north of the MUL area.                                                                            |
|                                           |                        | Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes") [2120]                   | No SPR connection to Shifting dunes along the shoreline with <i>Ammophila arenaria</i> as SAC is located 18 km north of MUL Area.                                                                                      |
| Rockabill to Dalkey Island SAC (IE003000) | 27                     | Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]                                                       | Yes. Potential SPR connection as Rockabill to Dalkey Island SAC is within 100km of MUL Area.                                                                                                                           |

## Oriel Wind Farm Project

| European Site (Code)             | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                       | Connections (Source-Pathway Receptors)                                                                                                                                               |
|----------------------------------|------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                        | Reefs [1170]                                                             | No SPR connection. The closest occurrence is mapped at Rockabill Island, approximately 30 km south of the MUL area (NPWS, 2013).                                                     |
| Lambay Island SAC (IE000204)     | 39                     | Reefs [1170]                                                             | No SPR connection. The closest occurrence is mapped at Lambay Island, 39 km south of the MUL area (NPWS, 2024b).                                                                     |
|                                  |                        | Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]            | No SPR connection to vegetated sea cliffs of the Atlantic and Baltic coasts as this habitat is mapped along the north and east coasts of Lambay Island, 39 km south of the MUL area. |
|                                  |                        | Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]                     | Yes. Potential SPR connection as Lambay Island SAC is within 100km of MUL Area.                                                                                                      |
|                                  |                        | Grey seal ( <i>Halichoerus grypus</i> ) [1364]                           | Yes. Potential SPR connection as Lambay Island SAC is within 100km of MUL Area.                                                                                                      |
|                                  |                        | Harbour seal ( <i>Phoca vitulina</i> ) [1365]                            | Yes. Potential SPR connection as Lambay Island SAC is within 100km of MUL Area.                                                                                                      |
| North Channel SAC (UK0030399)    | 44                     | Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]                     | Yes. Potential SPR connection as North Channel SAC is within 100km of MUL Area.                                                                                                      |
| Strangford Lough SAC (UK0016618) | 47                     | Coastal lagoons [1150]                                                   | No SPR connection to Coastal lagoons as this habitat is located 47 km north of the MUL area.                                                                                         |
|                                  |                        | Large shallow inlets and bays [1160]                                     | No SPR connection to Large shallow inlets and bays as this habitat is located 47 km north of the MUL area.                                                                           |
|                                  |                        | Annual vegetation of drift lines [1210]                                  | No SPR connection to Annual vegetation of drift lines as this habitat is located 47 km north of the MUL area.                                                                        |
|                                  |                        | Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330] | No SPR connection to Atlantic salt meadows as this habitat is located 47 km north of the MUL area.                                                                                   |
|                                  |                        | Mudflats and sandflats not covered by seawater at low tide [1140]        | No SPR connection to Mudflats and sandflats not covered by seawater at low tide as this habitat is located 47 km north of the MUL area.                                              |



## Oriel Wind Farm Project

| European Site (Code)                                      | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                                                 | Connections (Source-Pathway Receptors)                                                                                                                                          |
|-----------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                           |                        | Perennial vegetation of stony banks [1220]                                                                                         | No SPR connection to Perennial vegetation of stony banks as this habitat is located 47 km north of the MUL area and above the HWM.                                              |
|                                                           |                        | Harbour seal ( <i>Phoca vitulina</i> ) [1365]                                                                                      | Yes. Potential SPR connection as Strangford Lough SAC is within 100km of MUL Area.                                                                                              |
|                                                           |                        | Reefs [1170]                                                                                                                       | No SPR connection to Reefs as this habitat is located 47 km north of the MUL area.                                                                                              |
|                                                           |                        | <i>Salicornia</i> and other annuals colonising mud and sand [1310]                                                                 | No SPR connection to <i>Salicornia</i> and other annuals colonising mud and sand as this habitat is located 47 km north of the MUL area.                                        |
| North Anglesey Marine / Gogledd Mrn Forol SAC (UK0030398) | 52                     | Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]                                                                               | Yes. Potential SPR connection as North Anglesey Marine / Gogledd Mrn Forol SAC is within 100km of MUL Area.                                                                     |
| Codling Fault Zone SAC (IE003015)                         | 59                     | Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]                                                                               | Yes. Potential SPR connection as Codling Fault Zone SAC is within 100km of MUL Area.                                                                                            |
|                                                           |                        | Submarine structures made by leaking gases [1180]                                                                                  | No SPR connection to Submarine structures made by leaking gases as this habitat is located 52 km south of the MUL area.                                                         |
| Slaney River Valley SAC (IE000781)                        | 96                     | Estuaries [1130]                                                                                                                   | No SPR connection to Estuaries as this habitat is mapped 3 km west of the opening of Wexford Bay, 96 km south of the MUL area.                                                  |
|                                                           |                        | Mudflats and sandflats not covered by seawater at low tide [1140]                                                                  | No SPR connection to Mudflats and sandflats not covered by seawater at low tide as this habitat is mapped throughout Slaney River Valley SAC, 96 km south of the MUL area.      |
|                                                           |                        | Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]                                                          | No SPR connection to Atlantic salt meadows as this habitat is located 96 km south of the MUL area.                                                                              |
|                                                           |                        | Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] | No SPR connection to Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation as this habitat is mapped 9 km |

## Oriel Wind Farm Project

| European Site (Code) | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup>                                                                                                       | Connections (Source-Pathway Receptors)                                                                                                                                                                                                                        |
|----------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                        |                                                                                                                                                          | upstream of Wexford Bay and Slaney River Valley SAC is located 96 km south of the MUL area.                                                                                                                                                                   |
|                      |                        | Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]                                                                   | No SPR connection to Old sessile oak woods as this habitat is mapped 25 km upstream of Wexford Bay, above the HWM and Slaney River Valley SAC is located 96 km south of the MUL area.                                                                         |
|                      |                        | Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0] | No SPR connection to Alluvial forests as this habitat is mapped 7 km upstream of Wexford Estuary and Slaney River Valley SAC is located 96 km south of the MUL area                                                                                           |
|                      |                        | Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]                                                                                             | No SPR connection to Freshwater Pearl Mussel as this is located within the Slaney River above the HWM, 96 km south of the MUL area                                                                                                                            |
|                      |                        | <i>Petromyzon marinus</i> (Sea Lamprey) [1095]                                                                                                           | No SPR connection to Sea Lamprey as this QI species is located within the Slaney River Valley SAC 96 km south of the MUL area beyond the ZoI.                                                                                                                 |
|                      |                        | <i>Lampetra planeri</i> (Brook Lamprey) [1096]                                                                                                           | No SPR connection to brook lamprey as it is not a diadromous fish species (i.e. it is confined to the freshwater section of the Slaney River and does not migrate to the marine environment). Thus, there is no potential for connectivity with the MUL Area. |
|                      |                        | <i>Lampetra fluviatilis</i> (River Lamprey) [1099]                                                                                                       | No SPR connection to River Lamprey as this species is located within the Slaney River Valley SAC 96 km south of the MUL area beyond the ZoI.                                                                                                                  |
|                      |                        | <i>Alosa fallax fallax</i> (Twaite Shad) [1103]                                                                                                          | No SPR connection to QI Twaite Shad as this QI species is located within the Slaney River Valley SAC 96 km south of the MUL area beyond the ZoI.                                                                                                              |
|                      |                        | <i>Salmo salar</i> (Salmon) [1106]                                                                                                                       | No SPR connection to QI Salmon as this QI species is located within the Slaney River Valley SAC 96 km south of the MUL area and beyond the ZoI.                                                                                                               |
|                      |                        | <i>Lutra lutra</i> (Otter) [1355]                                                                                                                        | No SPR connection to Otter as this QI species is located within the Slaney River Valley SAC 96 km south of the MUL                                                                                                                                            |

## Oriel Wind Farm Project

| European Site (Code) | Distance MUL Area (km) | List of Relevant Qualifying Interests <sup>3</sup> | Connections (Source-Pathway Receptors)                                                |
|----------------------|------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|
|                      |                        |                                                    | area and outside of the 20 km territory range for Eurasian otters.                    |
|                      |                        | Harbour seal ( <i>Phoca vitulina</i> ) [1365]      | Yes. Potential SPR connection as Slaney River Valley SAC is within 100km of MUL Area. |

# Oriel Wind Farm Project

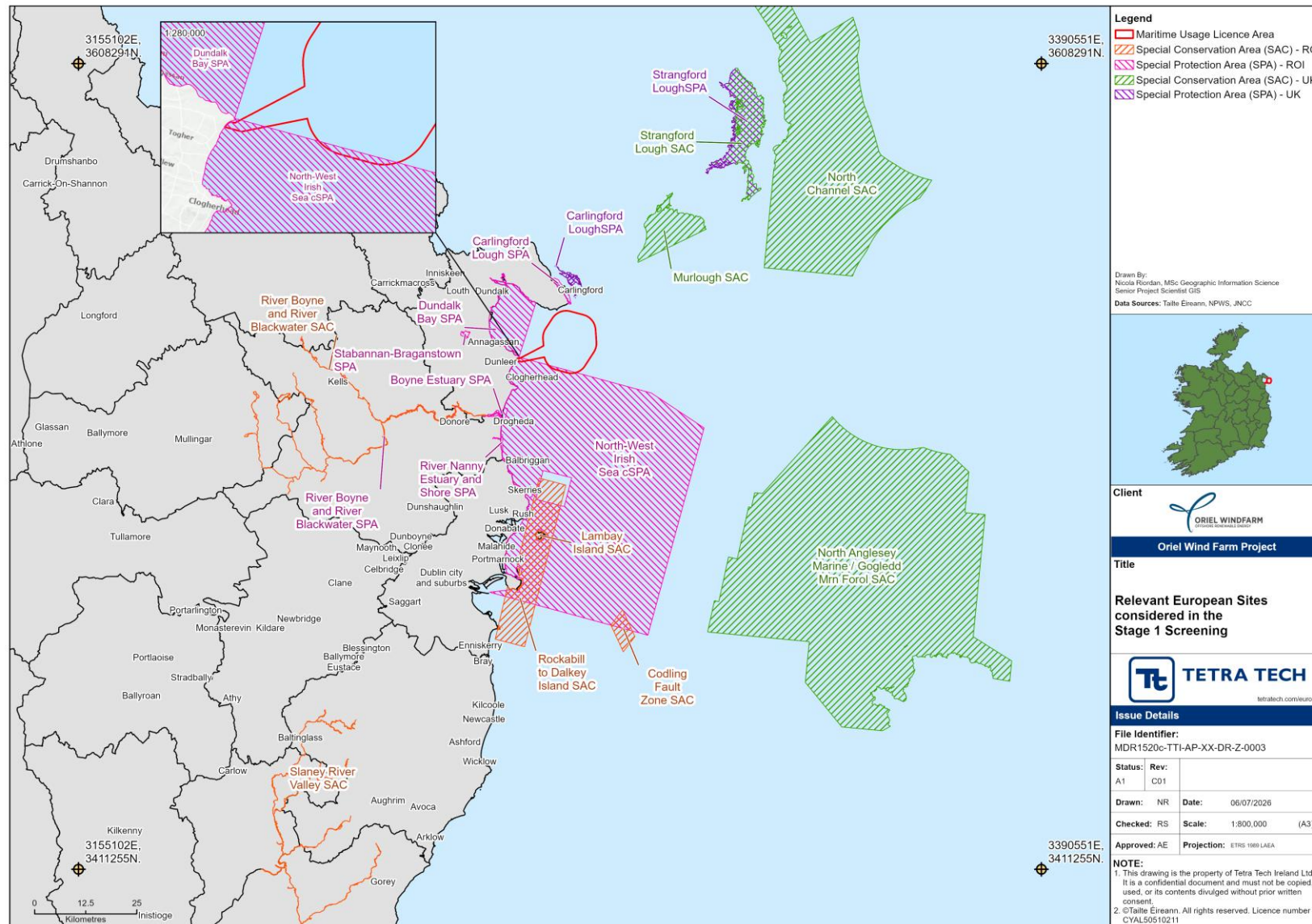


Figure 5-1 Relevant European Sites considered in the Stage 1 Screening

## 5.4 Conservation Objectives

The integrity of a European site (referred to in Article 6(3) of the EU Habitats Directive) is determined based on the conservation status of the QI of these sites.

European and national legislation places a collective obligation on Ireland to maintain at favourable conservation status areas designated as SAC and SPA. The government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

The specific conservation objectives for each European site in Ireland are available on [www.npws.ie](http://www.npws.ie).

## 6.0 Supporting Information for Screening for Appropriate Assessment

### 6.1 Management of European Sites

The SI works are not directly connected with or necessary to the management of any European site(s).

### 6.2 Assessment of Likely Significant Impacts

This section determines whether the impacts identified in Section 5.2.1 could have significant effects on the QI or SCIs of the European sites identified in Section 5.3 in view of the conservation objectives of the sites. As described in section 5.2.3, the potential impacts arising from the SI works have been identified as follows:

- Noise, vibration, lighting, and human presence-related species disturbance (including the presence of increased marine traffic, where relevant);
- Habitat loss, alteration and/ or fragmentation (including increased SSC/ smothering);
- Underwater noise disturbance, including injury and or displacement of Annex II marine mammals, fish and diving birds; and
- Risk of collision.

The following sections will assess whether these impacts are likely to give rise to significant effects on the QIs or SCIs of European sites. The assessment has been split into sections based on receptor type, i.e. otter, marine mammals, fish, and birds.

## 6.2.1 Annex II Otter

This section assesses the potential for likely significant effects on those SACs designated for Annex II otter, where there is potential for connectivity with the MUL Area and the proposed SI Works. The assessment is based on the precautionary principle and has been undertaken in the absence of mitigation.

The SPR assessment (Table 5-1) concluded that the following impacts have the potential to affect Annex II otter as a result of the SI works:

- Habitat loss, alteration and/or fragmentation;
- Above-water noise, vibration and lighting; and,
- Underwater noise.

Survey activities with the potential to interact with Annex II otter are as follows:

- Marine and intertidal geophysical surveys;
- Marine and intertidal geotechnical surveys;
- Environmental surveys (quadrat/dig over sampling); and
- Archaeological intertidal monitoring walkovers and sampling (if required).

European sites taken forward for assessment for otter are listed in Table 6-1 below. The following sections assess the likelihood for significant effects to otter and summarise the screening for relevant European sites.

Table 6-1 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Otter

| European Site Code                            | Distance from the Area of Interest (km) | List of Relevant Annex II Qualifying Interests <sup>4</sup> |
|-----------------------------------------------|-----------------------------------------|-------------------------------------------------------------|
| River Boyne and River Blackwater SAC (002299) | 15                                      | <i>Lutra lutra</i> (Otter)                                  |

### 6.2.1.1 Habitat loss, alteration and/or fragmentation

It is considered that intrusive sampling works will not interact with otter holts or couches as these do not occur on beach below the HWM where intrusive sampling will take place. **Likely significant effects to otter due to habitat loss, alteration and/or fragmentation can be excluded.**

### 6.2.1.2 Above-water noise, vibration and lighting

Surveys undertaken on the intertidal zone at Dunany Beach may interact with commuting or foraging otters, although as stated in Section 4.2.1, desk based and site-specific survey data show otter activity is rare within areas adjacent the MUL Area, and no otters have been recorded on the beach. The intertidal geophysical surveys will involve a small team of surveyors walking along the beach or intertidal zone (below the HWM) using non-intrusive hand-held equipment or GPR. During these non-intrusive surveys, and access for same, no above-water noise, vibration or light will be emitted beyond baseline levels. Similarly, environmental and archaeological monitoring (if required) will be limited to a small team of surveyors with no noise-producing equipment. While relatively remote, Dunany Beach experiences regular recreational activity including walkers, dog walkers, horse riding and cockle picking (RPS, 2025c). The above surveys will not provide additional disturbance to otters that may utilise the coastline beyond the existing baseline of disturbing activities.

<sup>4</sup>Qualifying interests that have not been identified as relevant to this specific assessment are excluded from this table. A full list of QIs for each site considered is provided in , and in each of the receptor-specific assessments.



Intertidal geotechnical surveys (excavation of trial pits/boreholes) will produce airborne noise and vibration which could disturb otters utilising the intertidal zone. In the unlikely event that otters from the River Boyne and River Blackwater SAC (15 km away) are present on the beach during sampling, any airborne disturbance will be temporary and limited in spatial extent. Given the limited size, scale and duration of the SI works within the context of this distance, otters from the River Boyne and River Blackwater SAC will not be foraging within the MUL Area in numbers that would lead to significant effects in light of the conservation objectives (e.g. the extent and number of habitats and ability of otter to access habitats, etc).

While the precise sampling locations are not known, they will be within the MUL Area below the HWM along the intertidal zone. Regardless of the location of sampling within these areas, the conclusion remains that any disturbance is likely to be temporary and limited in nature. **Therefore, likely significant effects to otter due to above-water disturbance can be ruled out.**

### 6.2.1.3 Underwater noise

As otter tend to forage within 80 m of the shoreline (NPWS, 2009), any potential effects are likely to be associated with survey activity very close to the landfall location, rather than survey activity further offshore. Nonetheless, there is potential for interaction between foraging otters and underwater noise generated during the geophysical and geotechnical surveys close to shore. For otters foraging in the marine environment, this has the potential to result in injury and/or disturbance. As stated previously, it is considered unlikely that otters from the River Boyne and River Blackwater SAC, which is 15 km away, will be present within the MUL Area, and site-specific surveys have not recorded otter on Dunany Beach. However, out of an abundance of caution, as the geophysical and geotechnical surveys will emit underwater noise and there is potential for otter to be foraging in the nearshore marine environment, likely significant effects cannot be excluded in the absence of further investigation against site-specific conservation objectives and/or application of mitigation (if appropriate).

While there are no published underwater noise injury criteria for Eurasian otter, Southall et al. (2019) has provided injury criteria for the 'Other marine carnivores in water (OCW)' hearing group, which includes sea otters. The OCW criteria is extended to Eurasian otter in accompanying Subsea Noise Technical Report in the absence of more suitable criteria. **Likely significant effects cannot be excluded for QI otter from River Boyne and River Blackwater SAC, due to the potential for underwater noise injury/disturbance.**

## 6.2.2 Annex II Marine Mammals

This section assesses the potential for likely significant effects on those SACs designated for Annex II marine mammals, where there is potential for connectivity with the MUL Area and the proposed SI works. The assessment is based on the precautionary principle and has been undertaken in the absence of mitigation.

The SPR assessment (Table 5-1) concluded that the following impacts have the potential to affect Annex II marine mammal species as a result of the SI works:

- Above-water noise, vibration and lighting;
- Habitat loss, alteration and/or fragmentation (including increased SSC/smothering);
- Underwater noise; and,
- Risk of collision.

European sites taken forward for assessment for Annex II marine mammals are listed in Table 6-2 below. The following sections assess the likelihood for significant effects to marine mammals and summarise the screening for relevant European sites.

Table 6-2 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Marine Mammals

| European Site (Code)                                     | Distance from the Area of Interest (km) | List of Relevant Annex II Qualifying Interests <sup>5</sup>                                                                        |
|----------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Murlough SAC (UK0016612)                                 | 18                                      | Harbour seal ( <i>Phoca vitulina</i> )                                                                                             |
| Rockabill to Dalkey Island SAC (IE003000)                | 27                                      | Harbour porpoise ( <i>Phocoena phocoena</i> )                                                                                      |
| Lambay Island SAC (IE000204)                             | 39                                      | Harbour porpoise ( <i>Phocoena phocoena</i> )<br>Grey Seal ( <i>Halichoerus grypus</i> )<br>Harbour Seal ( <i>Phoca vitulina</i> ) |
| North Channel SAC (UK0030399)                            | 44                                      | Harbour porpoise ( <i>Phocoena phocoena</i> )                                                                                      |
| Strangford Lough SAC (UK0016618)                         | 47                                      | Harbour seal ( <i>Phoca vitulina</i> )                                                                                             |
| North Anglesey Marine / Gogledd Mm Forol SAC (UK0030398) | 52                                      | Harbour porpoise ( <i>Phocoena phocoena</i> )                                                                                      |
| Codling Fault Zone SAC (IE003015)                        | 59                                      | Harbour porpoise ( <i>Phocoena phocoena</i> )                                                                                      |
| Slaney River Valley SAC (IE000781)                       | 96                                      | Harbour seal ( <i>Phoca vitulina</i> )                                                                                             |

### 6.2.2.1 Above-water noise, vibration and lighting

There is potential for the intertidal geotechnical surveys at the landfall to disturb hauled out seals, however, the MUL Area including its intertidal area does not overlap with SACs designated for Annex I harbour seal or grey seal or known haul-outs for these species. As part of site-specific surveys to inform the planning application for the Oriel Wind Farm Project, seal surveys were undertaken between October 2024 and October 2025 within 500 m of the export cable landfall location at Dunany Bay Beach. No grey or harbour seals were recorded hauled out at the landfall location during these surveys (RPS, 2025c). As stated above in Section 4.2.2.3 and 4.2.2.4, for both grey and harbour seal the closest haul out site to the MUL Area is at the mouth of Carlingford Lough 5 km north of the MUL Area with the next closest site located at Clogherhead located 6 km from the MUL Area. Given the distance to known haul out sites for seals from the MUL Area and the lack of evidence for seal hauling out at Dunany, there will be no interaction between the SI works and hauled out seals. Therefore, above-water noise, vibration and lighting from the SI works will not result in likely significant effects on grey or harbour seals. Likely significant effects due to above-water disturbance can therefore be ruled out for all marine mammal SACs.

### 6.2.2.2 Habitat loss, alteration and/or fragmentation

The MUL Area does not overlap spatially with European sites designated for marine mammals. Therefore, there is no risk of direct habitat loss to haul-out sites or supporting habitats for these species.

There is potential for minimal benthic habitat loss within the MUL Area outside of the relevant SACs due to intrusive survey methodologies (grab sampling and boreholes). These activities may lead to impacts on marine mammals or smothering of benthic and pelagic species due to increased SSC. As outlined previously, suspended sediment associated with discrete, sequential samples or boreholes will not give rise to significant levels of suspended sediments and associated smothering of benthic or pelagic prey species. The MUL Area is in an exposed location off the east coast of Ireland, and it can be expected that habitats will recover quickly from the relatively limited sediment extraction. Therefore, it is anticipated that any suspended sediments will settle out of suspension rapidly, and that habitats and species in the region are adapted to natural levels of

<sup>5</sup> Qualifying interests that have not been identified as relevant to this specific assessment are excluded from this table. A full list of QIs for each site considered is provided in , and in each of the receptor-specific assessments.

turbidity. The extent of sediment to be removed is relatively limited (41 vibrocores/gravity cores, 78 offshore boreholes and 60 grab samples) within the MUL Area, therefore, there will be plenty of alternative foraging habitat and prey sources available for temporarily displaced foraging marine mammals. While the precise sampling locations are not known within the MUL Area, the conclusion remains the same. **Likely significant effects due to habitat loss, alteration or fragmentation for QI marine mammals as a result of the proposed SI works therefore can be ruled out for all marine mammal SACs.**

#### 6.2.2.3 Underwater noise

There is the potential for underwater noise generated during the geophysical and geotechnical surveys, as well as from survey vessels, to result in injury and/or disturbance to QI marine mammal species.

The latest guidance (National Oceanic and Atmospheric Administration, 2024) reflects the current best available method for assessing impact from noise on marine mammals. Based on this guidance, auditory impacts to marine mammals can be defined as non-reversible auditory injury (previously referred to as permanent threshold shift (PTS)), or as a temporary threshold shift (TTS) in hearing sensitivity, which can have negative effects on the ability to use natural sounds (e.g. to communicate, navigate, locate prey) for a period of minutes, hours or days.

The zone of injury is classified as the distance over which a fleeing marine mammal can suffer non-reversible auditory injury. Injury thresholds are based on a dual criteria approach using both un-weighted  $L_P$  (maximal instantaneous sound pressure level (SPL) and marine mammal hearing weighted sound exposure level (SEL). The hearing weighting function is designed to represent the sensitivity for each hearing group within which acoustic exposures can have auditory effects. For full details on marine mammal hearing groups, please refer to the accompanying Subsea Noise Technical Report.

As the geophysical and geotechnical surveys will emit underwater noise, these impacts are modelled in the Subsea Noise Technical Report. As there is potential for injury and/or disturbance to marine mammals, likely significant effects cannot be excluded in the absence of further investigation and application of mitigation. **In summary, in the absence of mitigation, likely significant effects due to underwater noise disturbance cannot be excluded for all marine mammal SACs considered in this Appropriate Assessment Screening Report:**

- Rockabill to Dalkey Island SAC;
- Lambay Island SAC;
- Codling Fault Zone SAC;
- Slaney River Valley SAC;
- Strangford Lough SAC;
- Murlough SAC;
- North Channel SAC; and
- North Anglesey Marine / Gogledd Mrn Forol SAC.

#### 6.2.2.4 Collision Risk

Vessel strikes are a known cause of mortality in marine mammals (Laist et al., 2001). Non-lethal collisions have also been documented (Laist et al., 2001; Van Waerebeek et al., 2007). Injuries from such collisions can be divided into two broad categories: blunt trauma from impact and lacerations from propellers. Injuries may result in individuals becoming vulnerable to secondary infections or predation.

It has been calculated that a maximum of three vessels (an offshore survey vessel/JUB, nearshore vessel/rib and a USV) could be operating at any one time within the MUL Area. For the geophysical surveys, the vessels will be travelling in a predefined trajectory. It is considered that this will allow animals to predict the movement of the vessels and therefore avoid collisions. It is likely that the other survey vessels (i.e. benthic survey

vessels, geotechnical survey vessel and metocean equipment deployment vessels) will be stationary for extended periods throughout their operations which will reduce the potential for collision with these vessels. The typical speed of the survey vessel while on survey will be 4 knots but may reach a maximum of 10 knots while transiting to and from survey locations. There is a regular baseline of vessel traffic within the MUL Area, while commercial and fishing vessels transverse the MUL Area to access nearby ports i.e. Warrenpoint Port in Co. Down, Kilkeel Harbour Co. Down, Greenore Port Co. Louth, Dundalk Port, Co. Louth, Port Oriel Co. Louth and Drogheda Port Co. Louth. A shipping and navigational risk assessment conducted as part of the wider project showed that the MUL Area is used primarily by fishing vessels, with some cargo vessel routes passing through the eastern and northeastern region of the MUL Area. A notably greater density of vessels was observed during summer in contrast to winter. This indicates a potential seasonal variation in vessel density within the MUL Area (RPS, 2024f).

It is, therefore, reasonable to assume that marine mammals in the area are exposed to vessel traffic on a regular basis and may exhibit some habituation. In addition, the increase in vessel traffic at any one time is considered to be very low, given the location of the MUL Area. On this basis it is predicted that collisions between survey vessels and marine mammals originating from all relevant SACs will be extremely unlikely. **Likely significant effects due to collision can therefore be ruled out for all marine mammal SACs.**

### 6.2.3 Annex II Migratory Fish

This section assesses the potential for likely significant effects on those SACs designated for Annex II migratory fish species, where there is potential for connectivity with the MUL Area and the proposed SI works. The assessment is based on the precautionary principle and has been undertaken in the absence of mitigation.

The SPR assessment (Table 5-1) concluded that the following impacts have the potential to affect Annex II migratory fish species as a result of the SI works:

- Habitat loss, alteration and/or fragmentation (including increased SSC/smothering); and,
- Underwater noise.

European sites taken forward for assessment for Annex II migratory fish species are listed in Table 6-3 below. The following sections assess the likelihood for significant effects to migratory fish and summarise the screening for relevant European sites.

Table 6-3 European sites selected for consideration in the Screening for Appropriate Assessment for Annex II Migratory Fish

| European Site (Code)                          | Distance from the Area of Interest (km) | List of Relevant Annex II Qualifying Interests <sup>6</sup>                    |
|-----------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------|
| River Boyne and River Blackwater SAC (002299) | 15                                      | River lamprey ( <i>Lampetra fluviatilis</i> )<br>Salmon ( <i>Salmo salar</i> ) |

<sup>6</sup> Qualifying interests that have not been identified as relevant to this specific assessment are excluded from this table. A full list of QIs for each site considered is provided in , and in each of the receptor-specific assessments.

### 6.2.3.1 Habitat loss, alteration and/or fragmentation (including increased SSC/smothering)

The proposed SI works do not overlap spatially with European sites designated for relevant Annex II migratory fish species (river lamprey, sea lamprey, Atlantic salmon and twaite shad), therefore there is no risk of direct habitat loss to spawning or nursery habitats within these SACs.

There is potential overlap between the MUL Area and the migratory routes of these species, migrating to/from their natal rivers. As outlined in Section 5.3.1, the proposed intrusive sampling techniques are limited to discrete sampling locations and undertaken sequentially (i.e. only one location sampled at any time), over the course of a survey campaign. Therefore, the SI works will not mobilise large volumes of sediment. It is expected that suspended sediment will settle out relatively quickly in the high energy environment with no likelihood of extensive sediment plumes. Smothering of migratory fish species from mobilised sediments is therefore considered unlikely. Given the limited size, scale and duration of the SI works within the context of the distance to the River Boyne and River Blackwater SAC, migratory fish species are highly unlikely to be present within the MUL Area in numbers that would lead to significant effects in light of the conservation objectives (e.g. juvenile abundance, extent of spawning habitats etc.).

While the precise sampling locations are not known, they will be within the MUL Area, and regardless of the location of sampling, the conclusion remains the same. Therefore, it is considered unlikely that intrusive sampling as part of the SI works will give rise to significant effects due to smothering or habitat loss on the migratory fish species of relevant European sites. **Likely significant effects due to habitat loss, alteration or fragmentation (including increased SSC/smothering) can therefore be ruled out for all migratory fish SACs.**

### 6.2.3.2 Underwater noise

The proposed geophysical and geotechnical surveys will produce underwater noise which has the potential to impact Annex II migratory fish. As no European sites designated for migratory fish overlap with the MUL Area, the risk is that fish could experience adverse effects as they migrate to/from their natal rivers and transit through the MUL Area.

The impacts of noise on fish can broadly be split into three categories: i) lethal and physical injury; ii) auditory injury; and iii) behavioural response. Hearing loss can be permanent or comprise a temporary reduction in hearing sensitivity (i.e. Temporary Threshold Shift (TTS)). At sound levels lower than those that may cause physical injury or mortality, noise may also cause behavioural effects on a species, for example, avoidance of an area or changes in swimming speed (Mueller-Blenke., 2010). This may be significant if it causes, for example, a migratory species to be delayed or diverted from their course.

Most fish species are capable of hearing within a frequency range of 50 Hz up to 500 to 1,500 Hz. A smaller number of species (notably clupeids) can detect sounds to over 3 kHz while a few species can detect sounds to well over 100 kHz (Popper and Hastings, 2009). Fish can be grouped into the following categories based on the presence or absence of a swim bladder and on the potential for that swim bladder to improve the hearing sensitivity and range of hearing (Popper et al., 2014):

- Group 1 fish: fish with no swim bladder or other gas chamber - with regards to migratory fish, this includes sea lamprey and river lamprey. These species are less susceptible to barotrauma and only detect particle motion, not sound pressure. However, some barotrauma may result from exposure to sound pressure;
- Group 2 fish: fish with swim bladders in which hearing does not involve the swim bladder or other gas volume - with regards to migratory fish, this category includes Atlantic salmon. These species are susceptible to barotrauma although hearing only involves particle motion, not sound pressure;
- Group 3 fish: fish in which hearing involves a swim bladder or other gas volume - with regards to migratory fish, this category includes species such as Allis shad and Twaite shad. These species are susceptible to barotrauma and detect sound pressure as well as particle motion; and

- Fish eggs and larvae.

As detailed in Section 4.2.3 above, the migratory fish species which are qualifying interests of the European sites identified to have potential connectivity with the MUL Area are river lamprey and Atlantic salmon. As outlined in section 4.2.3, the Irish Sea is not a known migration route for Atlantic salmon. Thresholds for harm to fish species have been based on the sound exposure guidelines for fish proposed by the Washington State Department of Transport Biological Assessment Preparation for Transport Projects Advanced Training Manual (WSDOT, 2020) and Canadian Department of Fisheries and Ocean Effects of Seismic energy on Fish: A Literature review (Worcester, 2006). The full details of this assessment are included in the Subsea Noise Technical Report. The full details of this assessment have not been repeated here, but the main conclusions of the noise assessment relevant to Annex II migratory fish found that no auditory injury would occur beyond 10 m of the sound sources, and TTS would be within 14 m of sound sources. Therefore, given the distance between the SAC for which migratory fish are designated (15 km), the risk ranges for both auditory injury and TTS being within tens of metres of all sound sources, and the limited scale and temporary duration of the proposed SI works within the Irish Sea, it is considered unlikely that there will be interaction between the underwater noise sources and river lamprey and salmon migrating to/from the River Boyne and River Blackwater SAC.

The Irish Sea is not a known migration route for salmon (see Section 4.2.3) and river lamprey are more likely to be found in estuarine waters rather than further offshore, therefore these species are unlikely to be present in any significant numbers within the MUL Area. **Therefore, likely significant effects to migratory fish species of the River Boyne and River Blackwater SAC due to underwater noise can be screened out.**

## 6.2.4 Birds

This section assesses the likelihood of significant effects on those SPAs where there is potential for connectivity with the MUL Area and the proposed SI works. The assessment is based on the precautionary principle and has been undertaken in the absence of mitigation.

The SPR assessment (Table 5-1) outlined the following potential sources of impacts to birds as a result of the SI works:

- Above water noise, vibration and lighting;
- Habitat loss, alteration and/ or fragmentation (including increased SSC/smothering); and,
- Underwater noise.

Relevant SPAs and SCI bird species have been listed in Table 5-2 above. The following sections assess the likelihood for significant effects to these species and summarise the screening for relevant European sites.

European sites taken forward for assessment for bird species are listed in Table 6-4 below. The following sections assess the likelihood for significant effects to birds and summarise the screening for relevant European sites.

Table 6-4 European sites selected for consideration in the Screening for Appropriate Assessment for Birds

| European Site (Code)                | Distance from the Area of Interest (km) | List of Relevant SCI <sup>7</sup>                                                                                                                        |
|-------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| North-west Irish Sea SPA (IE004236) | Overlaps MUL Area                       | Red-throated diver ( <i>Gavia stellata</i> ) [A001]<br>Great Northern diver ( <i>Gavia immer</i> ) [A003]<br>Fulmar ( <i>Fulmarus glacialis</i> ) [A009] |

<sup>7</sup>QI/ SCI that have not been identified as relevant to this specific assessment are excluded from this table. A full list of QI/ SCI for each site considered is provided in Table 5-2, and in each of the receptor-specific assessments.



| European Site (Code)       | Distance from the Area of Interest (km) | List of Relevant SCI <sup>7</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                         | <p>Manx shearwater (<i>Puffinus puffinus</i>) [A013]</p> <p>Cormorant (<i>Phalacrocorax carbo</i>) [A017]</p> <p>Shag (<i>Phalacrocorax aristotelis</i>) [A018]</p> <p>Common scoter (<i>Melanitta nigra</i>) [A065]</p> <p>Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179]</p> <p>Common gull (<i>Larus canus</i>) [A182]</p> <p>Lesser black-backed gull (<i>Larus fuscus</i>) [A183]</p> <p>Herring gull (<i>Larus argentatus</i>) [A184]</p> <p>Great black-backed gull (<i>Larus marinus</i>) [A187]</p> <p>Kittiwake (<i>Rissa tridactyla</i>) [A188]</p> <p>Roseate tern (<i>Sterna dougallii</i>) [A192]</p> <p>Common tern (<i>Sterna hirundo</i>) [A193]</p> <p>Arctic tern (<i>Sterna paradisaea</i>) [A194]</p> <p>Guillemot (<i>Uria aalge</i>) [A199]</p> <p>Razorbill (<i>Alca torda</i>) [A200]</p> <p>Puffin (<i>Fratercula arctica</i>) [A204]</p> <p>Little gull (<i>Hydrocoloeus minutus</i>) [A862]</p> <p>Little tern (<i>Sternula albifrons</i>) [A885]</p>                                                                                                                                                                     |
| Dundalk Bay SPA (IE004026) | 0.3                                     | <p>Great crested grebe (<i>Podiceps cristatus</i>) [A005]</p> <p>Greylag goose (<i>Anser anser</i>) [A043]</p> <p>Light-bellied brent goose (<i>Branta bernicla hrota</i>) [A046]</p> <p>Shelduck (<i>Tadorna tadorna</i>) [A048]</p> <p>Teal (<i>Anas crecca</i>) [A052]</p> <p>Mallard (<i>Anas platyrhynchos</i>) [A053]</p> <p>Pintail (<i>Anas acuta</i>) [A054]</p> <p>Common scoter (<i>Melanitta nigra</i>) [A065]</p> <p>Red-breasted merganser (<i>Mergus serrator</i>) [A069]</p> <p>Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</p> <p>Ringed plover (<i>Charadrius hiaticula</i>) [A137]</p> <p>Golden plover (<i>Pluvialis apricaria</i>) [A140]</p> <p>Grey plover (<i>Pluvialis squatarola</i>) [A141]</p> <p>Lapwing (<i>Vanellus vanellus</i>) [A142]</p> <p>Knot (<i>Calidris canutus</i>) [A143]</p> <p>Dunlin (<i>Calidris alpina</i>) [A149]</p> <p>Black-tailed godwit (<i>Limosa limosa</i>) [A156]</p> <p>Bar-tailed godwit (<i>Limosa lapponica</i>) [A157]</p> <p>Curlew (<i>Numenius arquata</i>) [A160]</p> <p>Redshank (<i>Tringa totanus</i>) [A162]</p> <p>Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179]</p> |

| European Site (Code)                         | Distance from the Area of Interest (km) | List of Relevant SCI <sup>7</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                                         | Common gull ( <i>Larus canus</i> ) [A182]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Wetland and waterbirds [A999]                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Carlingford Lough SPA (IE004078)             | 4                                       | Light-bellied brent goose ( <i>Branta bernicla hrota</i> ) [A046]<br>Wetland and waterbirds [A999]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Boyne Estuary SPA (IE004080)                 | 12                                      | Shelduck ( <i>Tadorna tadorna</i> ) [A048]<br>Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Grey plover ( <i>Pluvialis squatarola</i> ) [A141]<br>Lapwing ( <i>Vanellus vanellus</i> ) [A142]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Sanderling ( <i>Calidris alba</i> ) [A144]<br>Black-tailed godwit ( <i>Limosa limosa</i> ) [A156]<br>Redshank ( <i>Tringa totanus</i> ) [A162]<br>Turnstone ( <i>Arenaria interpres</i> ) [A169]<br>Little tern ( <i>Sternula albifrons</i> ) [A885]<br>Wetland and waterbirds [A999] |
| Stabannan-Braganstown SPA (IE004091)         | 13                                      | Greylag goose ( <i>Anser anser</i> ) [A043]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| River Nanny Estuary and Shore SPA (IE004158) | 18                                      | Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]<br>Ringed plover ( <i>Charadrius hiaticula</i> ) [A137]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Sanderling ( <i>Calidris alba</i> ) [A144]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Wetland and waterbirds [A999]                                                                                                                                                                                                                                                   |

#### 6.2.4.1 Above water noise, vibration and lighting

Survey activities with the potential to interact with bird species are those in the nearshore and intertidal zones, namely:

- Intertidal geophysical surveys;
- Intertidal geotechnical surveys (trial pits/boreholes)
- Environmental surveys (walkover/dig over sampling);
- Marine geophysical, geotechnical and environmental surveys (in particular above-water noise, vibration and lighting from vessels and/or JUB); and
- Deployment of metocean and acoustic devices (above-water noise, vibration and lighting from vessels).

The intertidal geophysical surveys will involve a small team of surveyors walking along the beach or intertidal zone (below the HWM) using non-intrusive hand-held equipment or GPR. During these non-intrusive surveys, and access for same, no above-water noise, vibration or light will be emitted beyond baseline levels. Similarly, environmental and archaeological monitoring (if required) will be limited to a small team of surveyors with no noise-producing equipment. While relatively remote, Dunany Beach experiences regular recreational activity including walkers, dog walkers, horse riding and cockle picking (RPS, 2025c). The above surveys will not provide additional disturbance to birds that may utilise the coastline beyond the existing baseline of disturbing activities.

Intertidal geotechnical surveys (excavation of trial pits/boreholes) will produce airborne noise and vibration which could disturb birds utilising the intertidal and foraging in the nearshore area. The physical presence of survey vessels in the marine environment, and the noise associated with the operation of survey equipment, could result in a limited degree of disturbance to birds in the vicinity of the survey vessel. The MUL Area overlaps with the North-west Irish Sea SPA, which is designated to provide additional supporting habitats for foraging and maintenance behaviours for those seabirds that breed at colonies on the North-west Irish Sea's islands and coastal headlands (NPWS, 2023a). It is expected that any temporary displacement of SCI species of the North-west Irish Sea SPA will be comparable to that experienced in response to routine shipping traffic (Hartley Anderson Limited, 2020). If these activities are undertaken in the overwintering period (usually October to March), likely significant effects due to disturbance to overwintering birds from nearby SPAs cannot be ruled out without further assessment. While no SPAs for wintering birds directly overlap with the proposed SI works, SPAs within 20 km designated for wintering swan and goose species should be considered due to the potential for these species to travel to forage.

Therefore, out of an abundance of caution and based on the precautionary principle, the following SPAs are screened in for further assessment:

- North-west Irish Sea SPA
- Dundalk Bay SPA
- Carlingford Lough SPA
- Stabannan-Braganstown SPA

While the Boyne Estuary SPA and River Nanny Estuary and Shore SPA are both within 20 km of the MUL Area, they do not protect wintering swan or goose species likely to travel up to 20 km to forage. Seabird species for which these SPAs are designated (little tern at the Boyne Estuary SPA and herring gull at River Nanny Estuary and Shore SPA) are also protected in their foraging grounds by the North-west Irish Sea SPA. Therefore, these sites are screened out from further assessment.

#### **6.2.4.2 Habitat loss, alteration and/ or fragmentation (including increased SSC/smothering)**

There are no SPAs designated for wetland habitat that overlap the MUL Area. Wetland habitat is a qualifying interest of the following sites for wintering birds within 20 km of the MUL Area: Dundalk Bay SPA, Carlingford Lough SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA. Wetlands provide food, shelter and breeding habitat for many species. Both the offshore and intertidal SI works will occur outside of designated wetlands habitat. Therefore, there is no likelihood for significant effects to any SPAs due to habitat loss, alteration or fragmentation of SCI wetland habitats.

The Dundalk Bay SPA and its designated SCI wetland habitats is located 0.3 km from the MUL Area. As outlined in Section 5.3.1, the proposed intrusive sampling techniques are limited to discrete sampling locations and undertaken sequentially (i.e. only one location sampled at any time), over the course of a survey campaign. Therefore, the SI works will not mobilise large volumes of sediment. It is expected that suspended sediment will settle out relatively quickly in the high energy environment with no likelihood of extensive sediment plumes, and as such, there is no link to wetland habitats within the Dundalk Bay SPA. Similarly, due

to the limited scale and temporary nature of the SI works, there will be no changes to intertidal habitats within the MUL Area utilised by ex situ bird species from ecologically connected SPAs.

There is potential for benthic habitat loss due to intrusive sampling methodologies (grab sampling, boreholes, vibrocoring and anchoring of metocean and acoustic devices) and smothering of benthic and pelagic prey species due to increased SSC is considered next. The MUL Area overlaps with the North-west Irish Sea SPA which provides foraging opportunities for seabirds from neighbouring SPAs. The site-specific conservation objectives for seabirds at the North-west Irish Sea SPA advise that the spatial distribution, extent and abundance of foraging habitat (ha, location and forage biomass) should be sufficient for each species, that the spatial distribution of suitable habitat to support a population (ha, time and intensity of use) should be sufficient for each species, disturbance across the site must occur at levels that do not significantly impact population targets and spatial distribution of each species and that barriers to connectivity do not significantly impact populations sizes of in-situ or ex-situ SCI species (NPWS, 2023b).

As outlined previously, suspended sediment associated with discrete, sequential samples or boreholes will not give rise to significant levels of suspended sediments and associated smothering of benthic or pelagic prey species. The MUL Area is in an exposed location off the east coast of Ireland, and it can be expected that habitats will recover quickly from the relatively limited sediment extraction. Therefore, it is anticipated that any suspended sediments will settle out of suspension rapidly, and that habitats and species in the region are adapted to natural levels of turbidity. The extent of sediment to be removed is relatively limited (41 vibrocores/gravity cores, 78 offshore boreholes, 60 CPTs and grab samples), while the North-west Irish Sea SPA covers an area of approximately 2,333km<sup>2</sup> (NPWS, 2023a), therefore there is plenty of alternative foraging habitat available for temporarily displaced foraging birds. While the precise sampling locations are not known, they will be within the MUL Area, and regardless of the location of sampling, the conclusion remains the same. **Therefore, there is no likelihood for significant effects to any SPAs due to habitat loss, alteration or fragmentation of intertidal or subtidal habitats.**

#### 6.2.4.3 Underwater noise

There is potential for diving seabirds to interact with the marine surveys while underwater noise is being produced. The North-west Irish Sea SPA is designated for the protection of diving species, including cormorant, razorbill, guillemot, shag, common scoter, red-throated diver, and great northern diver. The North-west Irish SPA is a unique SPA in that it is solely an important resource for marine birds and not where colonies are located. The estuaries and bays that open into it along with connecting coastal stretches of intertidal and shallow subtidal habitats, provide safe feeding and roosting habitats through winter and migratory periods. These areas, along with the more pelagic marine waters further offshore, provide additional supporting habitats for seabirds that breed in colonies from other nearby designated sites (NPWS, 2023a). During the breeding season cormorant, razorbill, guillemot, and shag which utilise the North-west Irish Sea SPA are considered to do so on the basis of travelling to the site from surrounding connected colonies. These SCIs demonstrate moderate sensitivities to vessel disturbance (Garthe & Hüppop, 2004; Bradbury et al., 2014) and are therefore considered moderately sensitive to underwater noise associated with the SI works while red-throated and great northern diver demonstrate high sensitivities to vessel disturbance (Fleissbach et al., 2019). Common scoter exhibited the largest mean escape distance (1,600±777m) of all bird species within this study (Fleissbach et al., 2019). However, while these species utilise the areas within and surrounding the SPA for foraging and commuting to and from their colonies. They will already be subject to a degree of anthropogenic disturbance associated with existing vessel traffic within the area (See Section 6.2.2.4). Although it is acknowledged that low frequency noise can travel further underwater than in air, the levels of below water noise expected from survey activities are not considered to be much greater than those resulting from existing vessel noise from vessels transiting through the area. As such, baseline conditions in relation to potential disturbance and displacement inducing activities, will not be materially altered by the undertaking of the proposed SI works. Therefore, it is unlikely that the underwater noise associated with the proposed SI works will be of a level which could cause significant disturbance or displacement to SCI species.

Hartley Anderson Limited (2020) provides a summary of the available evidence on the auditory abilities and effects of underwater noise of diving birds, however, this evidence is very limited. While seabird responses to

approaching vessels are highly variable (e.g. Fliessbach et al. 2019), flushing disturbance would be expected to displace most diving seabirds from close proximity to the survey vessel and any towed equipment, thereby limiting their exposure to the highest sound pressures generated. Similarly, behavioural disturbance of seabirds due to acoustic survey activities is most likely to be temporary displacement associated with the physical presence of the vessel, comparable to that experienced by routine shipping traffic (Hartley Anderson Limited, 2020).

Indirect impacts on diving seabirds may also arise through effects of underwater noise on prey species, including fish and shellfish. Fish can be affected by underwater noise through both behavioural and physiological pathways. Observed responses include startle reactions, temporary avoidance of noise sources, changes in schooling behaviour and altered swimming patterns (Sarà et al. 2007; De Robertis and Handegard 2013). As stated in Section 6.2.3.2, the main conclusions of the noise assessment relevant to fish species found that no auditory injury would occur beyond 10 m of the sound sources and TTS would be within 14 m of sound sources for all geophysical scenarios (the same distances apply for all fish species as outlined in Subsea noise technical report (report ref: MDR1520C-TTI-00-XX-RP-Z-0003)). Therefore, as adult fish are generally highly mobile and capable of moving away from areas of elevated noise exposure and given the potential risk ranges for auditory injury is <10 m and TTS is within 14 m, this reduces the likelihood of potential injury on these prey species. For shellfish and other marine invertebrates, evidence suggests that behavioural and physiological responses to underwater noise may occur, including temporary stress responses and altered behaviour (Roberts et al. 2015; Day et al., 2016). However, injury and TTS to fish and shellfish were associated with high-intensity sound produced from airgun arrays which will not be undertaken as part of the proposed SI works (Popper et al. 2014).

Given the limited extent and duration of the proposed SI works, the mobility of many prey species, and the availability of prey across broader foraging areas, any potential reductions in prey availability are expected to be localised, temporary and reversible.

Given the limited extent of sound-producing activity, the limited time diving birds spend underwater, and given that birds are likely to be temporarily displaced to the surrounding area due to the presence of the vessel, it is considered that there is a very low likelihood of interaction between underwater noise sources and diving birds during the proposed SI works. **Therefore, no likely significant effects to diving birds due to underwater noise are expected, and no further assessment is required.**

## 7.0 In-combination effects

Even if projects are unlikely to have significant effects on their own, the effects in-combination with those of other plans or projects could be significant. An in-combination screening assessment has been carried out to identify other projects/plans that could act in-combination with the SI works to affect site conservation objectives (in accordance with OPR, 2021).

MARA has identified the following key steps for assessing in-combination effects:

1. Defining the Cumulative Effects Spatial Scope (CESS);
2. Defining the Cumulative Effects Temporal Scope (CETS);
3. Impact identification;
4. Pathway identification;
5. Prediction;
6. Identification of Plans or Projects that could act in combination;
7. Screening Stage Cumulative Effects Assessment conclusion; and
8. Managing cumulative impacts - to be carried out as part of Stage 2 AA process.

### 7.1 Cumulative Effects Spatial Scope (CESS)

The CESS was based on the maximum impact range identified in this Appropriate Assessment Screening Report when considering impacts of the proposed SI works. Beyond this maximum distance, the proposed SI works will have no effect and therefore no potential pathway to in-combination effects with other plans or projects. The JNCC's guidance document for assessing noise disturbance for harbour porpoise SACs (JNCC, 2025), where the findings were based on evidence gathered through monitoring and research through Brown et al., (2025) and Majewska et al., (2025), provides effective deterrent ranges (EDR) for similar survey activities as part of the proposed MUL. These EDRs may be applied as the maximum range within which in-combination effects can be considered. JNCC (2025) recommends an EDR of 3 km for MBES operating in waters up to 200 m depth, USBL and all types of sub-bottom profilers. Therefore, all projects and plans within 3 km of the MUL Area boundary are assessed with respect to likelihood of significant effects.

### 7.2 Cumulative Effects Temporal Scope (CETS)

The CETS was based on the potential for temporal overlap with the proposed SI works. As a five-year licence is sought, plans or projects likely to take place within the next six years were identified as potentially relevant, allowing for a precautionary one-year buffer to allow for the time between submission of this MULA and an MUL being granted.

### 7.3 Impact Identification

Potential impacts related to the proposed SI works are described in Section 5.2.1 of this Appropriate Assessment Screening Report. In the absence of mitigation, the proposed SI works individually have the potential to give rise to likely significant effects due to above-water and underwater noise disturbance. No likely significant effects due to collision risk or habitat loss are anticipated as a result of the proposed SI works individually, however, these potential impacts will be assessed in-combination with other plans and projects.

In order for other plans/ projects to act in-combination with the proposed SI works, they must also give rise to the above impacts.



## 7.3.1 Pathway Identification and Predication of Impacts

### 7.3.1.1 Above-water disturbance

Above-water disturbance due to the presence of humans, vessels and equipment, noise, vibration and lighting has the potential to occur during the SI works. The SI works and related effects will be temporary and of relatively short duration and will be limited in range to within the MUL Area. Therefore, it is considered that only projects which also have the potential to cause above-water disturbance and which are likely to occur at the same time as the SI works and are within the MUL Area have the potential to act in-combination.

It is considered unlikely that high-level plans have the potential to contribute to above-water disturbance occurring at the same time and in the same place as the SI works.

### 7.3.1.2 Habitat loss and/or disturbance

There is no potential for habitat loss and/or disturbance due to intrusive sampling methodologies in the marine and intertidal environment. As stated above in Section 5.3.1, the MUL Area does not overlap any SACs designated for Annex I habitats and it is anticipated that any suspended sediments as a result of intrusive sampling will settle out of suspension rapidly, with no potential for sediment plumes or smothering. Therefore, there is no potential for loss of supporting habitat for birds, fish or marine mammals due to the proposed SI works. However, projects occurring at the same time as the SI Works and within the MUL Area may have the potential to act in-combination.

It is considered unlikely that high-level plans have the potential to contribute directly to habitat loss and/or disturbance occurring at the same time and in the same place as the SI works.

### 7.3.1.3 Underwater noise disturbance

The proposed SI works will give rise to underwater noise, which, in the absence of mitigation, will lead to likely significant effects. Other projects in the marine environment with the potential to emit underwater noise within the CESS should be considered in-combination with the proposed SI works.

It is considered unlikely that high-level plans have the potential to contribute directly to underwater noise disturbance occurring at the same time and in the same place as the SI works.

### 7.3.1.4 Collision risk

The risk of collision due to survey vessel presence has been assessed in Section 6.2.2.4, and a conclusion of no likely significant effects has been drawn due to the existing baseline of vessel use within the MUL Area. As vessel traffic is a constant feature in the area within and surrounding the MUL Area, it is considered unlikely that the limited addition of vessels to the maritime area during proposed SI works has the potential to contribute significantly to background levels (and therefore the risk of collision with marine mammals), however, there is potential for other vessel-based works to act in-combination with the proposed SI works, therefore such projects will be considered.

It is considered unlikely that high-level plans have the potential to contribute directly to collision risk occurring at the same time and in the same place as the SI works.

## 7.3.2 Identification of Plans or Projects

Tetra Tech undertook a desk study using internet searches, planning databases and other available sources, as outlined below, to identify other plans, projects and activities likely to overlap with the CESS and CETS of the proposed SI works, which have the potential to give rise to in-combination effects.

### 7.3.2.1 Plans

The following plans were deemed relevant to the Project. Plans identified include:

- Climate Action Plan 2025;
- Future Framework for Offshore Renewable Energy (2025 Review)
- National Energy and Climate Plan 2021-2030;
- Offshore Renewable Energy Development Plan (OREDP) I (and draft OREDP II);
- Designated Maritime Area Plan (DMAP) Proposal for Offshore Renewable Energy (and Draft DMAP);
- Marine Plan for Northern Ireland;
- Project Ireland 2040 – National Planning Framework (revision 2025);
- National Marine Planning Framework (NMPF) 2021;
- National Biodiversity Action Plan 2023-2030; and
- Louth County Development Plan 2021-2027.

Following the identification of likely pathways for in-combination impacts, it is considered that for a plan to be able to act in-combination with the proposed SI works, it must determine the precise location of a project or designate specific land uses. While the proposed Oriel Wind Farm Project aligns with the objectives of high-level plans such as the National Marine Planning Framework (NMPF) and the Offshore Renewable Energy Development Plan (OREDP), without geographically specific actions or objectives, there is no pathway to interaction with the proposed SI works that could lead to likely significant effects.

**There are no anticipated in-combination effects from plans and therefore plan-level in-combination effects are screened out from further assessment.**

### 7.3.2.2 Projects

Other projects could potentially give rise to either direct impacts on habitats or species (loss of habitat, disturbance to species) or indirect impacts (e.g., activities which could affect water quality or hydrology which could in turn affect the status/health of populations of water dependant habitats or species).

A search of foreshore licence and marine licence applications which could interact with the SI works was conducted using the relevant consenting authority websites (July 2026) (DHLGH - foreshore applications, MARA - MULs, An Bord Pleanála (ABP) - Strategic Infrastructure Development (SID) - marine developments, Environmental Protection Agency (EPA) – Dumping at Sea (DaS) permits).

The proposed SI works overlap spatially with the Oriel Wind Farm Project (ACP ref: OA15.319799). As this MULA is for a five-year licence there is potential for temporal overlap given the expected construction commencement date of the Oriel Wind Farm Project in 2028/2029. Therefore, there is potential for cumulative effects between the proposed SI works and the overall Oriel Wind Farm Project.

The Applicant will shortly apply for a DaS permit to support the construction of the Oriel Wind Farm Project. For completeness, the DaS permit is considered here and will cover the deposition of drill arisings associated with the drilling of the monopile foundations. The works covered under the DaS permit are fully considered under the Oriel Wind Farm Project Planning Application; therefore, no additional works are associated with this DaS application. However, as there is temporal and spatial overlap with the MUL Area, the DaS application will be considered as a project in the in-combination assessment. There are no active DaS permits within the MUL Area 3 km of the proposed MUL Area. One inactive DaS permit (EPA ref: 336\_DS\_NA) overlaps the offshore wind farm area along its western boundary within Dundalk Bay. This permit was held by Greenore ferry services for dredged material and expired on 31/12/2001. Therefore, there is no potential for

in-combination effects due to habitat loss/disturbance, above-water disturbance effects with dredging and associated dumping between the SI works EPA ref: 336\_DS\_NA.

No MUL applications overlap the proposed MUL Area. The nearest MUL to the proposed SI works is MUL240011, located approximately 7 km south of the MUL Area. MUL240011 is for SI works to inform the location and design of a proposed port infrastructure between Skerries in Co. Dublin and Clogherhead in Co. Louth. The consultation period for the above MUL opened on the 21/04/2026 and closed on the 28/05/2026. As the above MUL is beyond the 3 km CESS for the proposed MULA, there is no potential for the projects to act in combination. Therefore, no MUL applications are considered to act in-combination with the proposed SI works and are not considered further in this assessment.

One MAC application was identified within the CESS and CETS of the proposed SI works (2022-MAC-001), for the overall Oriel Wind Farm Project, which overlaps spatially with the MUL Area. This MAC was granted consent on the 23/12/2022 for a period of 45 years. This MAC application is a consent to occupy the area for the term stated above, no works are proposed as part the application. Therefore, there is no potential for the proposed SI works and 2022-MAC-001 to act in-combination and this MAC is not considered further in this assessment.

Three foreshore licence applications within the CESS have been granted licences, as discussed below.

The Applicant was granted a foreshore licence (FS006840) to undertake SI works in support of the Oriel Wind Farm Project on 30/05/2019 for a period of two years from the commencement date. These SI works included geotechnical, geophysical, ecological and metocean surveys in support of the overall Oriel Wind Farm Project. This licence expired on the 30/05/2021 and as the proposed SI works associated with this MUL application will begin after this date, there is no potential for temporal overlap with the proposed SI works.

The Applicant was granted a foreshore licence (FS007383) to undertake SI works in support of the Oriel Wind Farm Project on 17/05/2023 for a period of three years from the commencement date. These SI works included geotechnical, geophysical, ecological and metocean surveys in support of the overall Oriel Wind Farm Project. This licence expired on the 17/05/2026 and as the proposed SI works associated with this MUL application will begin after this date, there is no potential for temporal overlap with the proposed SI works.

SSE Renewables Ltd was granted a foreshore licence (FS006973) commencing on 19/10/2020 for a period of five years, to undertake SI works off Clogher Head, Co. Louth and Braymore Point, Co. Dublin. These SI works included geotechnical, geophysical and ecological surveys undertaken to assess the suitability of the Irish Sea area for an 88MW offshore wind development. The location of the SI works under this foreshore licence overlap directly with the SI works proposed by the Applicant. Given the commencement date of the foreshore licence, the five-year licence period will not overlap with the timing of proposed SI works by the Applicant.

### 7.3.3 Screening Stage In-combination Effects Assessment Conclusion

Based on the above review of other projects occurring within the CESS and CETS of the proposed SI works, there is potential that the following projects could act in-combination and likely significant effects cannot be excluded at this stage:

- Oriel Wind Farm Project (ACP ref: OA15.319799)
- Oriel Wind Farm Project Dumping at Sea (DaS).

**In the absence of mitigation measures, there is the potential for in-combination effects with other projects and therefore in-combination effects are screened in for further assessment.**

## 8.0 Summary and Conclusions

### 8.1 Summary

In accordance with the relevant legislation and the methodology followed, supporting information to inform a Stage 1 Screening for Appropriate Assessment was compiled. This Appropriate Assessment Screening Report has been compiled in order to ascertain whether the proposed SI works are likely to have a significant effect on any European site.

Table 8-1 summarises the findings of this assessment and lists the 13 European sites for which likely significant effects cannot be excluded alone, without further evaluation or analysis, or the application of mitigation measures. The relevant QI/ SCI of these 13 sites will be considered in the applicant's Natura Impact Statement (NIS). No plans or projects with the potential to overlap spatially or temporally with the CESS and CETS of the proposed SI works were identified and therefore likely significant effects in-combination with other plans or projects can be excluded at this stage.

Table 8-1 Summary of European sites and relevant qualifying interests screened in for Likely Significant Effects

| European Site                       | Distance to Area of Interest (km) | Relevant QI/ SCI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Likely Significant Effect                 |
|-------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| North-west Irish Sea SPA (IE004236) | Within SAC boundary               | Red-throated diver ( <i>Gavia stellata</i> ) [A001]<br>Great northern diver ( <i>Gavia immer</i> ) [A003]<br>Fulmar ( <i>Fulmarus glacialis</i> ) [A009]<br>Manx shearwater ( <i>Puffinus puffinus</i> ) [A013]<br>Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]<br>Shag ( <i>Phalacrocorax aristotelis</i> ) [A018]<br>Common scoter ( <i>Melanitta nigra</i> ) [A065]<br>Black-headed gull ( <i>Chroicocephalus ridibundus</i> ) [A179]<br>Common gull ( <i>Larus canus</i> ) [A182]<br>Lesser black-backed gull ( <i>Larus fuscus</i> ) [A183]<br>Herring gull ( <i>Larus argentatus</i> ) [A184]<br>Great black-backed gull ( <i>Larus marinus</i> ) [A187]<br>Kittiwake ( <i>Rissa tridactyla</i> ) [A188]<br>Roseate tern ( <i>Sterna dougallii</i> ) [A192]<br>Common tern ( <i>Sterna hirundo</i> ) [A193]<br>Arctic tern ( <i>Sterna paradisaea</i> ) [A194]<br>Guillemot ( <i>Uria aalge</i> ) [A199]<br>Razorbill ( <i>Alca torda</i> ) [A200]<br>Puffin ( <i>Fratercula arctica</i> ) [A204]<br>Little gull ( <i>Hydrocoloeus minutus</i> ) [A862]<br>Little tern ( <i>Sternula albifrons</i> ) [A885] | Above water noise, vibration and lighting |
| Dundalk Bay SPA (IE004026)          | 0.3                               | Great crested grebe ( <i>Podiceps cristatus</i> ) [A005]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Above water noise, vibration and lighting |

| European Site                             | Distance to Area of Interest (km) | Relevant QI/ SCI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Likely Significant Effect                 |
|-------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
|                                           |                                   | Greylag goose ( <i>Anser anser</i> ) [A043]<br>Light-bellied brent goose ( <i>Branta bernicla hrota</i> ) [A046]<br>Shelduck ( <i>Tadorna tadorna</i> ) [A048]<br>Teal ( <i>Anas crecca</i> ) [A052]<br>Mallard ( <i>Anas platyrhynchos</i> ) [A053]<br>Pintail ( <i>Anas acuta</i> ) [A054]<br>Common scoter ( <i>Melanitta nigra</i> ) [A065]<br>Red-breasted merganser ( <i>Mergus serrator</i> ) [A069]<br>Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]<br>Ringed plover ( <i>Charadrius hiaticula</i> ) [A137]<br>Golden plover ( <i>Pluvialis apricaria</i> ) [A140]<br>Grey plover ( <i>Pluvialis squatarola</i> ) [A141]<br>Lapwing ( <i>Vanellus vanellus</i> ) [A142]<br>Knot ( <i>Calidris canutus</i> ) [A143]<br>Dunlin ( <i>Calidris alpina</i> ) [A149]<br>Black-tailed godwit ( <i>Limosa limosa</i> ) [A156]<br>Bar-tailed godwit ( <i>Limosa lapponica</i> ) [A157]<br>Curlew ( <i>Numenius arquata</i> ) [A160]<br>Redshank ( <i>Tringa totanus</i> ) [A162]<br>Black-headed gull ( <i>Chroicocephalus ridibundus</i> ) [A179]<br>Common gull ( <i>Larus canus</i> ) [A182]<br>Herring gull ( <i>Larus argentatus</i> ) [A184] |                                           |
| Carlingford Lough SPA (IE004078)          | 4                                 | Light-bellied brent goose ( <i>Branta bernicla hrota</i> ) [A046]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Above water noise, vibration and lighting |
| Stabannan-Braganstown SPA (IE004091)      | 13                                | Greylag goose ( <i>Anser anser</i> ) [A043]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Above water noise, vibration and lighting |
| River Boyne and River Blackwater SAC      | 15                                | Otter ( <i>Lutra lutra</i> ) [1355]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Underwater noise                          |
| Murlough SAC (UK0016612)                  | 18                                | Harbour seal ( <i>Phoca vitulina</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Underwater noise                          |
| Rockabill to Dalkey Island SAC (IE003000) | 27                                | Harbour porpoise ( <i>Phocoena phocoena</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Underwater noise                          |
| Lambay Island SAC (IE000204)              | 39                                | Harbour porpoise ( <i>Phocoena phocoena</i> )<br>Grey Seal ( <i>Halichoerus grypus</i> )<br>Harbour Seal ( <i>Phoca vitulina</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Underwater noise                          |

| European Site                                             | Distance to Area of Interest (km) | Relevant QI/ SCI                              | Likely Significant Effect |
|-----------------------------------------------------------|-----------------------------------|-----------------------------------------------|---------------------------|
| North Channel SAC (UK0030399)                             | 44                                | Harbour porpoise ( <i>Phocoena phocoena</i> ) | Underwater noise          |
| Strangford Lough SAC (UK0016618)                          | 47                                | Harbour seal ( <i>Phoca vitulina</i> )        | Underwater noise          |
| North Anglesey Marine / Gogledd Mrn Forol SAC (UK0030398) | 52                                | Harbour porpoise ( <i>Phocoena phocoena</i> ) | Underwater noise          |
| Codling Fault Zone SAC (IE003015)                         | 59                                | Harbour porpoise ( <i>Phocoena phocoena</i> ) | Underwater noise          |
| Slaney River Valley SAC (IE000781)                        | 96                                | Harbour seal ( <i>Phoca vitulina</i> )        | Underwater noise          |

## 8.2 Conclusions

Tetra Tech has prepared this report to provide the necessary information to MARA for them to complete a Screening for Appropriate Assessment of the potential for likely significant effects on European sites, in view of their conservation objectives, arising from the SI works either individually or in combination with other plans or projects. The potential impacts of the SI works have been considered in the context of the European sites potentially affected, their QI/ SCI and their conservation objectives, through the application of the SPR model, which considered the potential extent of effects from the SI works and the potential in-combination effects with other plans or projects. Measures intended to avoid or reduce the harmful effects of the proposed development on European sites (i.e. “mitigation measures”) have not been taken into account in this Appropriate Assessment Screening Report. The overall findings are as follows:

The SI works are not connected with or necessary to the management of the nature conservation interest of any European site.

In the absence of mitigation and/or further detailed consideration against site-specific conservation objectives, associated with the SI works, disturbance of SCI species as a result of above-water noise, vibration, lighting, and human presence is possible at the following European sites:

- North-west Irish Sea SPA
- Dundalk Bay SPA
- Carlingford Lough SPA
- Stabannan-Braganstown SPA

In the absence of mitigation, the geophysical, geotechnical and metocean surveys will introduce subsea noise that has the potential to impact on harbour porpoise, harbour seal and grey seal at the following European sites:

- Rockabill to Dalkey Island SAC (harbour porpoise)
- Lambay Island SAC (harbour porpoise, grey and harbour seal)



- Codling Fault Zone SAC (harbour porpoise)
- Slaney River Valley SAC (harbour seal)
- Strangford Lough SAC (harbour seal)
- Murlough SAC (harbour seal)
- North Channel SAC (harbour porpoise)
- North Anglesey Marine / Gogledd Mrn Forol SAC (harbour porpoise)

The potential for in-combination effects with other plans and projects has been assessed, however, there is no spatial or temporal interaction with other plans or projects and therefore in-combination effects are screened out from further assessment.

On the basis of objective information, it is our opinion that it cannot be excluded that the SI works, individually or in combination with other projects, will have a significant effect on a European site. It is respectfully submitted that MARA should conduct an Appropriate Assessment and therefore a Natura Impact Statement (NIS) will be prepared to assist MARA in conducting an Appropriate Assessment.

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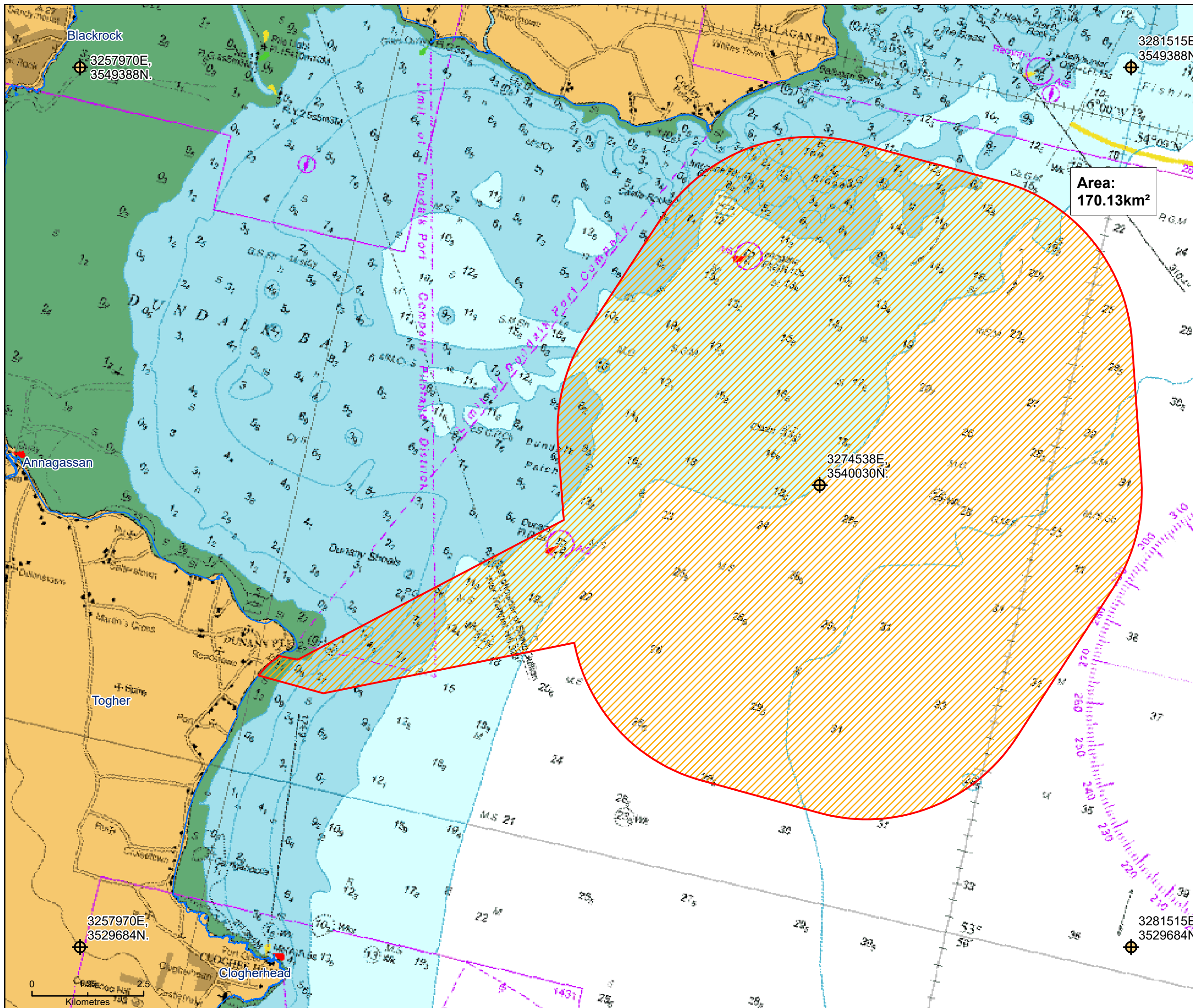
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## Appendix A Drawings



**Legend**

- Maritime Usage Licence Area
- High Water Mark
- Proposed Geophysical Survey Location

Drawn By:  
Nicola Riordan, MSc Geographic Information Science  
Senior Project Scientist GIS

Data Sources: Tailte Éireann

**Client**  
Oriol Wind Farm Project

**Title**  
Proposed geophysical  
survey location

tetratech.com/europe

**Issue Details**

**File Identifier:**  
MDR1520c-TTI-AP-XX-DR-Z-0002

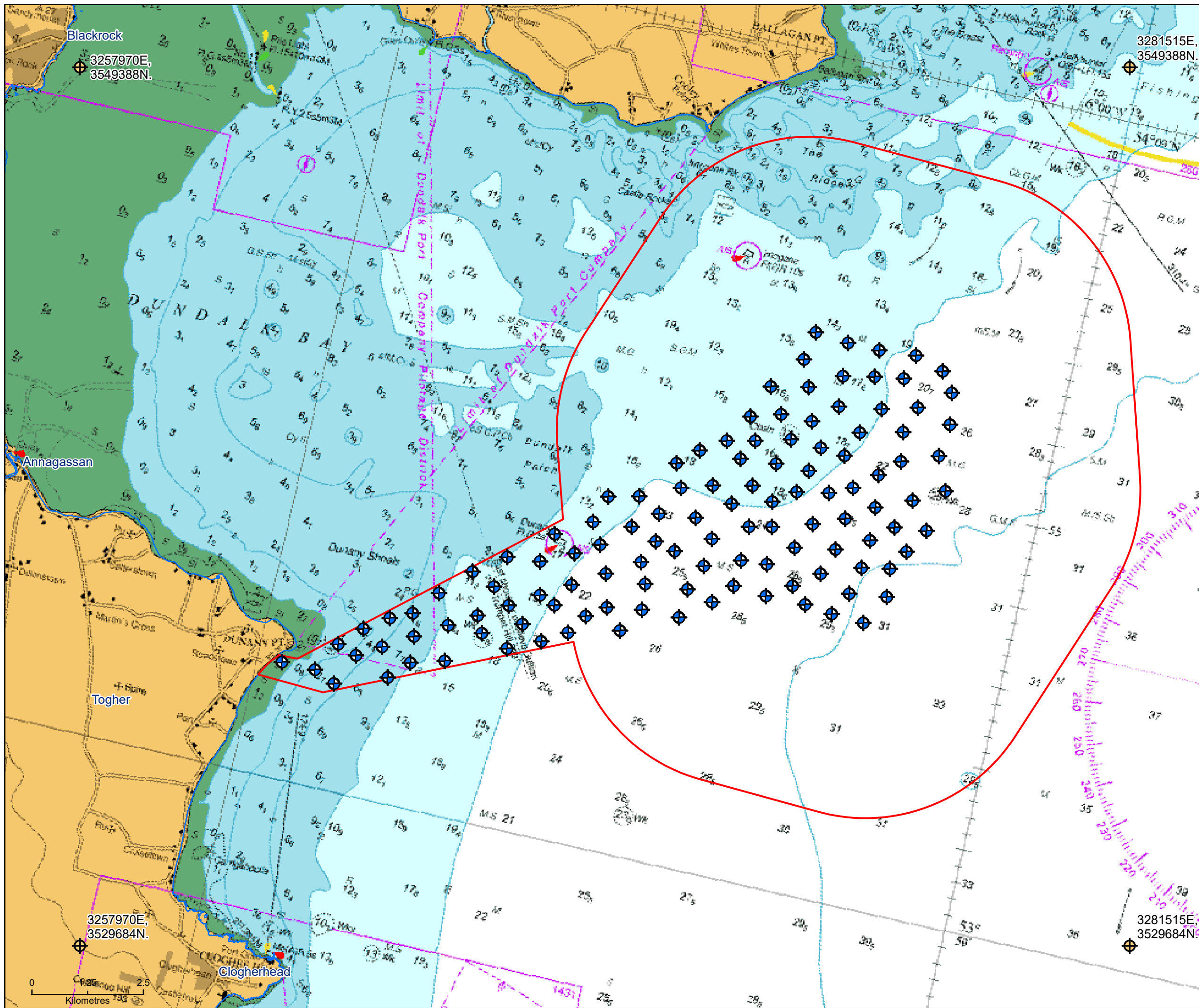
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|----------------------|-----------------------------------|
| <b>Status:</b><br>A1 | <b>Rev:</b><br>C01                |
| <b>Drawn:</b> NR     | <b>Date:</b> 06/07/2026           |
| <b>Checked:</b> RS   | <b>Scale:</b> 1:80,000 (A3)       |
| <b>Approved:</b> AE  | <b>Projection:</b> ETRS 1989 LAEA |

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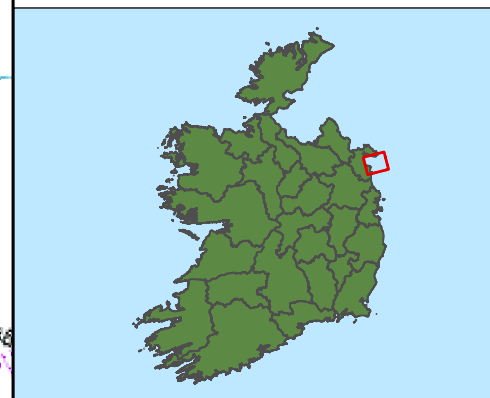


## Legend

- Maritime Usage Licence Area
- High Water Mark
- CPT and SPT

Drawn By:  
Nicola Riordan, MSc Geographic Information Science  
Senior Project Scientist GIS

Data Sources: Tailte Éireann



Client



Oriel Wind Farm Project

Title

Proposed marine geotechnical  
survey locations-  
CPT and SPT



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Issue Details

File Identifier:

MDR1520c-TTI-AP-XX-DR-Z-0006

Status:

A1

Rev:

C01

Drawn:

NR

Date:

06/07/2026

Checked:

RS

Scale:

1:80,000 (A3)

Approved:

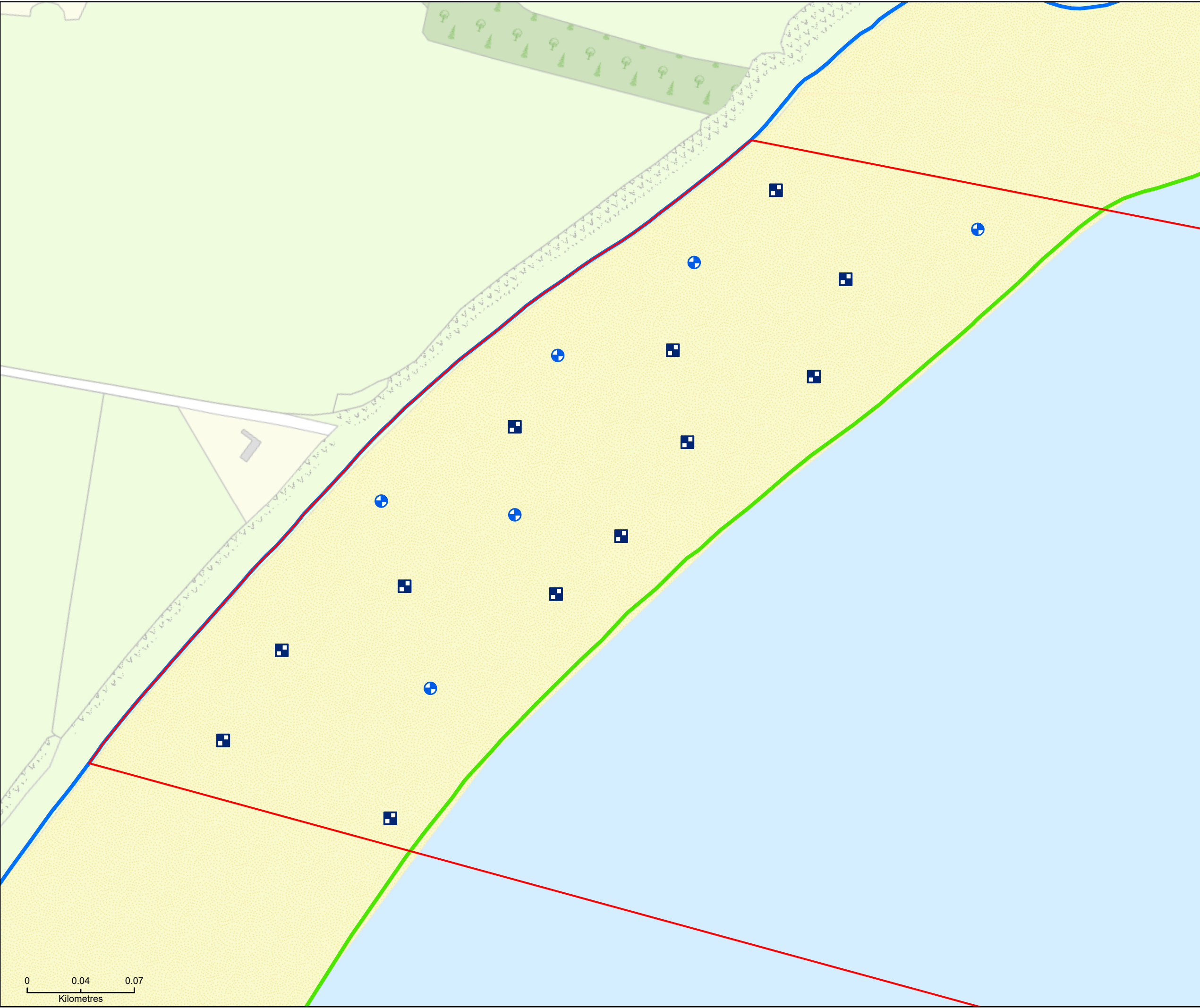
AE

Projection: ETRS 1989 LAEA

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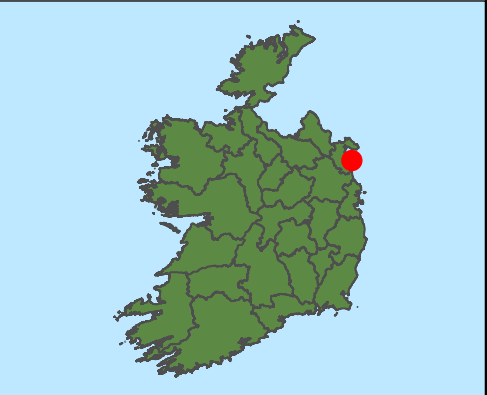


Legend

- Maritime Usage Licence Area
- High Water Mark
- Low Water Mark
- Borehole
- Trial Pit

Drawn By:  
Nicola Riordan, MSc Geographic Information Science  
Senior Project Scientist GIS

Data Sources: Tailte Éireann



Client



Oriel Wind Farm Project

Title

Proposed intertidal geotechnical  
survey locations-  
Trial pit and boreholes



TETRA TECH

tetrattech.com/europe

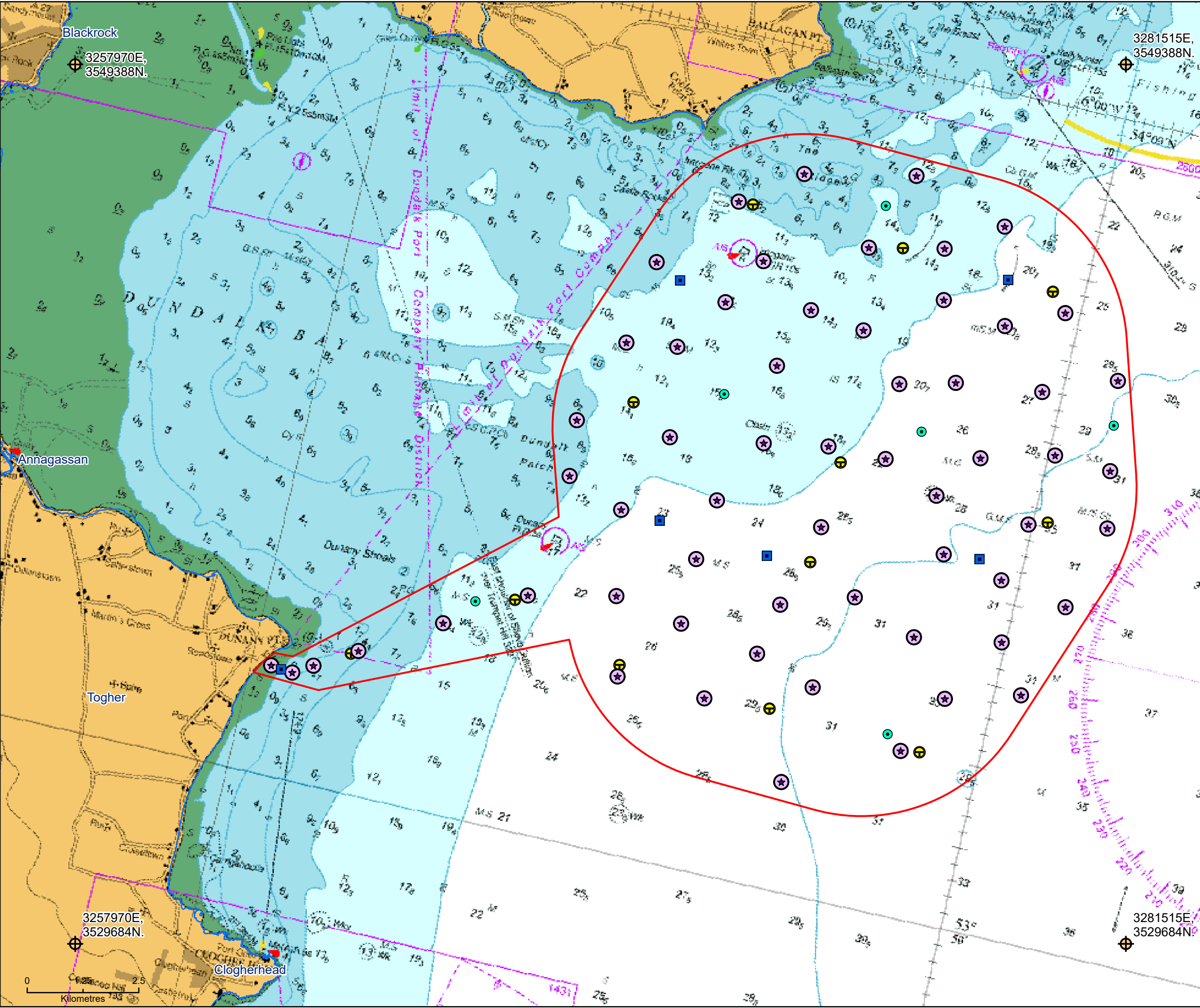
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MDR1520c-TTI-AP-XX-DR-Z-0007

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| A1        | C01  |                            |
| Drawn:    | NR   | Date: 06/07/2026           |
| Checked:  | RS   | Scale: 1:2,500 (A3)        |
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**Legend**

- Maritime Usage Licence Area
- High Water Mark
- Benthic Sample Locations
- CPODS
- Water Quality Sonde Locations
- Water Quality and Fish and Shellfish Sonde Locations

Drawn By:  
Nicola Riordan, MSc Geographic Information Science  
Senior Project Scientist GIS

Data Sources: Tailte Éireann

Client

Oriol Wind Farm Project

Title

Proposed environmental survey locations

tetrattech.com/europe

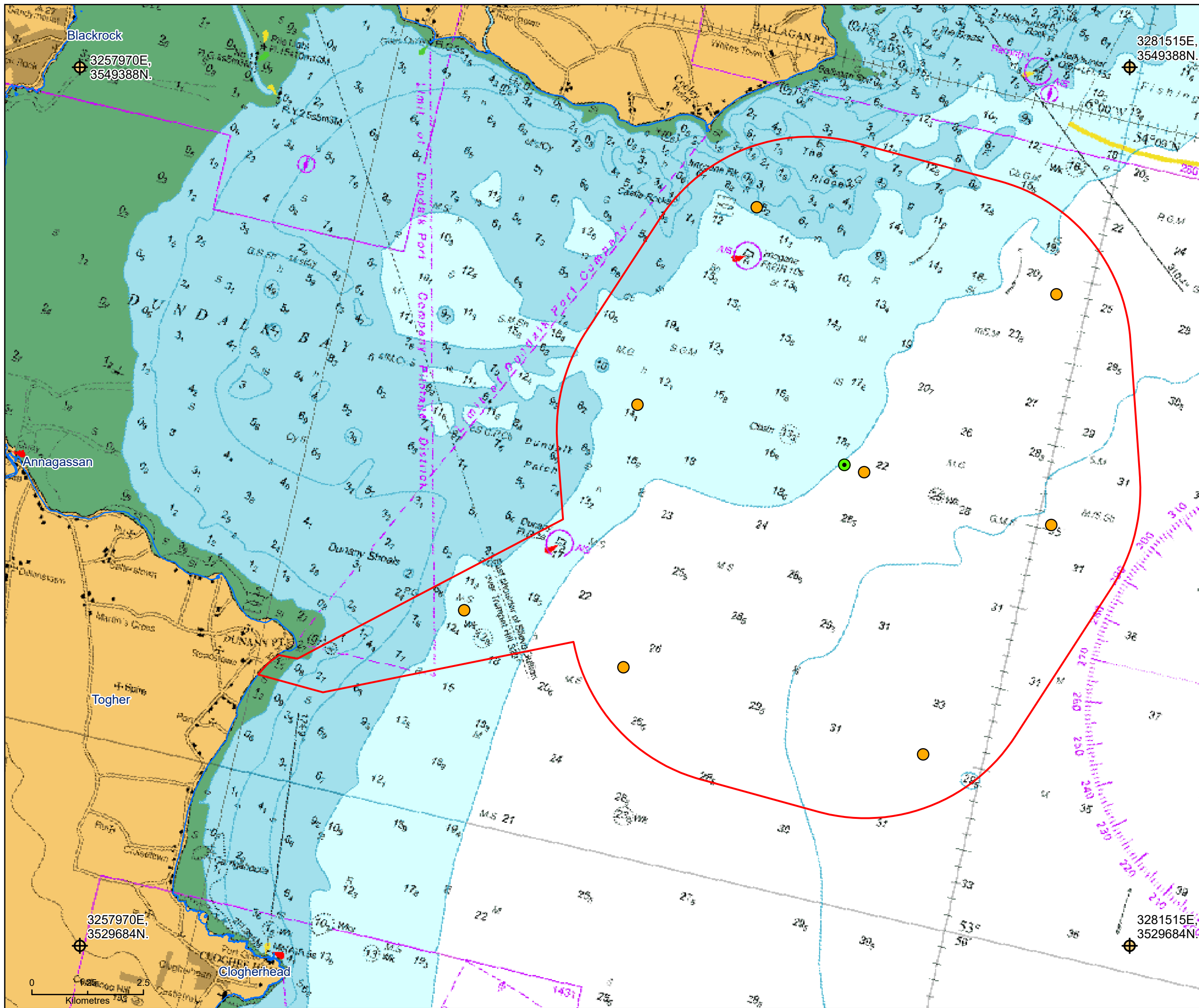
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| Checked:  | RS | Scale:      | 1:80,000 (A3)  |
| Approved: | AE | Projection: | ETRS 1989 LAEA |

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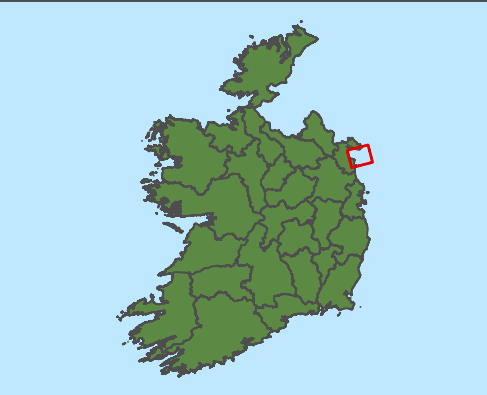


**Legend**

- Maritime Usage Licence Area
- High Water Mark
- ADCPs
- Metocean buoy

Drawn By:  
Nicola Riordan, MSc Geographic Information Science  
Senior Project Scientist GIS

Data Sources: Tailte Éireann



Client



Oriel Wind Farm Project

Title

**Proposed metocean  
survey locations-  
Metocean Buoy and ADCP**



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Issue Details

File Identifier:

MDR1520c-TTI-AP-XX-DR-Z-0012

Status:

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Rev:

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Drawn:

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