An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

SCREENING FOR APPROPRIATE ASSESSMENT REPORT FOR THE FORESHORE LICENCE APPLICATION FOR SITE INVESTIGATIONS FOR ORIEL WIND FARM, OFF CO. LOUTH

Application No. FS007383

10th May 2022

1 Introduction

1.1 Project Overview

Oriel Windfarm Limited (Oriel) is an Irish renewable energy company proposing to develop, subject to the relevant permissions, the Oriel offshore wind farm (the Project) located in the north-west Irish Sea, 22km off the coast of Dundalk, County Louth. The Project will include wind turbines mounted onto a foundation installed into the seabed, an offshore substation and interlinking cabling between the turbines and the substation and an export cable between the substation and the shore**.**

In May 2019 Oriel obtained a Foreshore Licence (reference no. FS 006840) for initial surveys in the offshore wind farm area and offshore cable corridor. Oriel undertook both onshore and offshore surveys and commenced the engineering design of the wind park. Oriel now intends to undertake further site investigations of the offshore wind farm area and the offshore cable corridor to investigate the stability of the soil (seabed sediments) for the design of foundations and the detailed routeing of the inter array and export cables.

1.2 Application documents

The following application documents were reviewed as part of this assessment:

- Investigative Foreshore Licence Application dated 18/11/2021
- Non-Statutory Environmental Report dated 17/11/2021
- Foreshore Licence Application for Marine Survey: Supporting Information dated 18/11/2021
- Supporting information for the Stage 1 Screening for Appropriate Assessment dated November 2021

The documentation submitted by the applicant was reviewed to assess as to whether it includes:

- Robust scientific information and analysis including the reasoning and justifications for the conclusion.
- Compliance with the tests and standards of AA as presented in European and national guidance.
- The assessment is carried out on the entirety of information submitted as part of consent application.
- A robust scientific assessment on the likelihood of significant effects.

1.3 Legislative background and AA process

Under Article 6.3 of the Habitats Directive (92/43/EEC) and the Europe and Communities (Birds and Natural Habitats) regulations 2011 (as amended), project proponents are required to provide sufficient information to enable the Competent Authorities to consider the potential effects of any project or plan which is not directly connected with, or necessary to, the management of a European site but is likely to have a significant effect on the site before a decision can be made to allow the plan or project to proceed. In order to ascertain if the plan or project, either alone or in-combination with other plans or projects, is likely to have significant effects on a European site an Appropriate Assessment of the implications of the plan or project on the site's conservation objectives is required. Under the Foreshore Act, as amended, a lease or licence must be obtained from the Minister for Housing, Local Government & Heritage before carrying out activities within the foreshore area, i.e. the area from the HWM to the 12 nautical mile limit. As the Consenting Authority, it is this Department which must carry out the Appropriate Assessment.

The first step in this process is a screening to determine if an Appropriate Assessment is required. Where significant effects of the project cannot be screened out, the Competent

Authority can request the project proponent to submit a Natura Impact Statement (NIS) to inform the Appropriate Assessmetnt for the project.
The European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), outlines the requirements for Screening for AA under Regulation 42(1) and 42(2), as follows:

42. (1) A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.
42. (2) A public authority shall carry out a screening for Appropriate Assessment under paragraph (1) before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.

This document represents the Department's Screening for an Appropriate Assessment Report for Site investigate works by Oriel Ltd off the coast of Co. Louth.

This report has been prepared with reference to the following guidelines and legislation:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. Official Journal of the European Communities.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version).
- European Communities (Birds and Natural Habitats) Regulations 2011. SI No. 477 of 2011.
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission 2018. 7621 final. Office for Official Publications of the European Communities, Luxembourg.
- Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities. DEHLG, 2009. Revision 2010.
- Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. Department of Arts, Heritage and the Gaeltacht, 2014
- Appropriate Assessment Screening for Development Management OPR Practice Note PN01 March 2021
- Relevant case law.

Statement of Authority

This Screening for Appropriate Assessment Report has been undertaken by Dr [redacted], an experienced marine ecologist with a wide range of experience from conservation, developing a quality index tool for Water Framework Directive, habitat mapping, aquaculture to deep water reef ecology. She completed a Ph.D. in the polychaete taxonomy and ecology in NUIG. Following which she undertook Post-Doctoral research on shallow water hydrothermal vent ecosystems at the Institute of Marine Biology of Crete. For the last 14 years she has worked with the National Parks and Wildlife Service as a marine ecologist where she developed the Site Specific Conservation Objectives for all marine Special Areas of Conservation. In this position she also reviewed Appropriate Assessments for the Aquaculture Licences and, as part of the statutory process, drafted Departmental responses to these. She has considerable experience in the Habitats Directive, Article 6 Assessments and the case law pertaining to them.

With NPWS she developed and delivered Article 17 monitoring programmes for Annex I habitats and Annex V species. She is on the Natura 2000 Marine Expert Working Group, the OSPAR Benthic Habitats Expert Group and MSFD Integrated Monitoring Programme working group. She has been on a number of research steering groups including the NPWS/EPA co-funded CLEAR project on restoration of coastal lagoons, EcoSystem Services on the VIBES project and the Ecostructure project [https://www.ecostructureproject.eu]. She has been Ireland's representative on the Marine and Coastal Biodiversity expert working group for the UN Convention on Biodiversity.

2 Screening for Appropriate Assessment

2.1 Management of European Sites

This proposed works are not directly connect with or necessary to the management of any European site.

2.2 Description of local site characteristics.

The Foreshore licence application area comprises the Oriel offshore wind farm area and the offshore cable corridor. The offshore wind farm area is located off the coast of County Louth to the east of Dundalk Bay, approximately 22km east of Dundalk, 18km east of Blackrock, 5km south of the Cooley Peninsula and 10km north-east of Dunany Point. The offshore wind farm area covers approximately 27.8km^2 and is broadly hexagonal in shape with a length of approximately 5.3km west to east and 6.7km north to south.

The offshore cable corridor is approximately 11km in length and covers an area of approximately 25km^2. The corridor is approximately 4km at its widest point, southwest of the offshore wind farm area, and narrows to approximately 1km at its narrowest point, just before landfall 700m south of Dunany Point.

The EMODnet data shows the seabed in this area to be that of muddy sand to coarse sediment.

2.3 Description of the proposed project

The site investigation works will consists of the following elements:

<u>Geophysical Survey</u>

- Multibeam Echosounder (MBES) system for detailed bathymetric mapping. The equipment will operate within a frequency range of 70-100kHz with sound pressure levels in the range of 225-231dB re1µPa at 1 metre range.
- Side Scan Sonar (SSS) to achieve detailed seabed morphology and seafloor mapping. The equipment will operate within a frequency range of 100-500kHZ with source levels at 235dB re 1µPa at 1 metre range.
- Magnetometer to detect geomorphological anomalies and ferrous obstructions. The process is non-intrusive, and the device will not make any physical contact with the seabed at any point.
- Sub-bottom Profiling (SBP), both single and multi-sources, to identify and characterise the layers of sediment/rock underneath the seafloor. The equipment to be used will have a primary frequency of between 85 and 115kHz (with secondary low frequencies of between 2 and 20kHZ) and source levels of 235-245dB re 1µPa at 1 metre range.
- Ultra-high-resolution multi-channel seismic (UHRS) to identify and characterise the layers of sediment/rock underneath the seafloor within the offshore site area. It will have the following characteristics as a minimum:
    - repeatable source,
    - frequency range of between 1kHz and 3.5kHz,
    - broadband width in excess of 2.5kHz at -10db,
    - vertical resolution better than 0.5 metres,
    - penetration 50 metres,
    - variable energy levels 100-1000 Joules,
    - record length suitable for the maximum depth required (250ms),
    - sampling rate 0.25
- Intertidal geophysical surveys including seismic, electrical resistivity and electromagnetic methods.

USBL beacon may be used to precisely locate towed equipment (such as a sidescan sonar fish) relative to the vessel. Exemplar equipment includes Sonardyne Wideband Sub-Mini 6 Plus

(WSM6+), Sonardyne Type 8300 Compatt 6, Kongsberg HiPAP which have a typical operating frequency of 20-40kHz.
This will take approximately four weeks depending on weather conditions.

Geotechnical Survey & Sediment Sampling:
27 deep investigation locations at proposed structure locations (25 wind turbines sites and two options for the offshore substation location). Each deep investigation location will require up to 3 drilled **boreholes** with a target depth of 50m below the seabed. 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 testing (SCPT) over the full length of a borehole. These tests involve a shear wave source, located on a downhole probe or on the drilling frame at the surface respectively, and downhole geophones. While the activity can be described as resulting in impulsive sounds, the source levels are minor (70dB). SCPT tests will be executed at a minimum of four of the locations, which will be confirmed following the results of the geophysical survey. Two seismic measurements shall be carried out during each SCPT stroke at a depth interval of 1m; the envisaged number is 40-60 SCPT tests in total. The boreholes will be advanced by alternating PCPT/SCPT and push/core sampling; requirements will depend on the material type encountered.
Forty one shallow investigation locations along proposed inter-array and export cable routes. Each location will require one **vibrocore** or **gravity** core with a target depth of 3m below the seabed. Vibrocoring is performed where cohesionless soil is expected. The vibrocorer will be lowered onto the seabed, after which the vibrocoring process will be started. Upon refusal or at target depth, the vibrocorer will be recovered on deck where the recovery rate is measured. Gravity core (wireline self-weight penetration sampler) will be performed where cohesive soil is expected. The gravity corer will be lowered on the seabed and will penetrate 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 is measured.
Up to 6 deep investigation locations in the intertidal area. Each location would be a drilled borehole with a target depth of up to 50m.
Up to 12 shallow investigation locations in the intertidal area. Each location would be an excavated trial pit or borehole with a target depth of 3m below the beach. Excavated locations to be backfilled immediately on completion of the investigation. Cores and CPTs may be taken from the boreholes or trial pits.
This will take approximately four to eight months depending on weather conditions. It will need to be extended if unforeseen ground conditions are discovered.

Environmental monitoring/ecological sampling

- Proposed to deploy up to 6 FPOD or CPOD devices to provide acoustic assessment of the presence/absence and species types of cetaceans (whales and dolphins). Each device will require a robust, heavy weight mooring blocks of *ca*. 250kg, clump chain and rope with either an acoustic release mechanism and benthic buoy or a robust mooring with a surface marker buoy. Batteries must be replaced and data downloaded every 3/4 months. Deployment and servicing would be undertaken from a survey vessels.
- Proposed to deploy up to 6 sondes for water quality monitoring of parameters including turbidity, salinity, temperature, pH, dissolved oxygen, electrical conductivity. Each sonde will require a robust, heavy weight mooring block, clump chain and rope with either an acoustic release mechanism plus benthic buoy or a robust mooring with a surface marker buoys.
- Benthic survey techniques may include drop down video (DDV) and deployment of a mini Hamon grab or van Veen grab to obtain samples of 1-5kg in mass each. Manual digging

may be used in the intertidal zone to collect the samples. Samples would be analysed to determine the benthic faunal community present and sediment geochemistry.

- Up to 6 sondes may be deployed for the tracking of fish or shellfish within the windfarm and export cable corridor. Each sonde will require a robust, heavy weight mooring block, clump chain and rope with either an acoustic release mechanism plus benthic buoy or a robust mooring with a surface marker buoys.

This will take approximately 24 months depending on weather conditions.

Oceanographic and meteorological

- All metocean survey works will occur at one location within the marine survey area. 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 will take approximately 24 months weeks depending on weather conditions. This may be greatly reduced if findings are in line with existing data collected from previous surveys.

2.4 Screening for Likely Significant effects

2.4.1 Physical disturbance to seabed from survey activities

Annex I habitats

The presence of a jack-up barge and the placement of mooring blocks for equipment on the seafloor could cause physical disturbance to the benthic communities of Annex I marine habitats. Vibrocores, boreholes and grab samples will result in loss of sediment and also the release of sediment plumes in the water column.

Sites which directly overlap with the marine survey area or are within a 5km buffer (encompasses the estimated maximum tidal excursion (3.5km) from the survey area and the extent to which suspended sediment plume effects would be expected to occur), and for which there is an impact pathway were screened in.

2.4.2 Physical presence of survey vessel

Birds and marine mammals

The presence and/or movement of the survey vessel in an area that is utilised by overwintering birds or by those foraging from coastal SPAs may cause temporarily disturbance to those species. Collision with survey vessels is a potential effect of the proposed works on marine mammals.

SPAs for waterbird species sensitive to vessel disturbance (e.g. divers and seaducks) which are located within 4km of the survey area, or where activities take place within shallow coastal waters known to be used by such species.

For seabirds, SPAs for which a sensitive qualifying interest (e.g. razorbill, cormorant and guillemot) could theoretically be present in the survey area based on available foraging range data (e.g. Woodward *et al*. 2019) were screened in.

For marine mammal species where the site boundary overlaps the survey area, and for pinnipeds any site within foraging range of 50km for harbour seal and 100km for grey seal were screen in (Zones of Influence). For cetaceans it is those that are qualifying interests in SACs within the relevant management unites (IAMMWG 2021) which are screened in.

2.4.3 Underwater noise

Birds

The information on the hearing abilities of diving birds and evidence of the effects of underwater anthropogenic noise is very limited. Direct effects from underwater acoustic surveys on diving birds could potentially occur through physical damage, given exposure to sufficiently high amplitudes, or through behavioural disturbance. Deeper-diving species which spend longer periods of time underwater (e.g. auks) may be most at risk of exposure, but all species which routinely submerge in pursuit of prey and benthic feeding opportunities in marine and estuarine habitats may be exposed to anthropogenic noise. Seabirds' responses to approaching vessels is highly variable (e.g. Fliessbach et al., 2019) however flushing disturbance would be expected to displace most diving seabirds from close proximity to survey vessels and towed equipment. This would therefore limit their exposure to under water noise.

Marine mammals

For marine mammals, given the characteristics of the noise sources produced by non-seismic geophysical surveys, effects are considered to be negligible but with a high level of uncertainty (DECC 2016). For seismic surveys Thompson *et al*., (2013) concluded that such surveys lead to short-term disturbance but long-term or broad-scale displacement did not occur. Reported responses include avoidance, interrupted foraging behaviour, changes in swimming speed, direction and surfacing patterns, and alteration of the intensity and frequency of calls (review in Erbe *et al*. 2019). Chronic exposure has also been linked to an increase in stress-related hormones (Rolland *et al.* 2012). Harbour porpoises, white-sided dolphins and minke whales have been shown to respond to survey vessels by moving away from them while white-beaked dolphins have shown attraction (Palka & Hammond 2001). Dolphins appeared to temporarily interrupt their activity when disturbed, staying in the area and quickly resuming foraging as the boat moved away.

Fish

Studies on fish mortality or behavioural response to noise generated by seismic surveys is highly variable, from no effects to long term auditory damage. The ability of salmon to respond to sound pressure is regarded as relatively poor with a narrow frequency span, a limited ability to discriminate between sounds, and a low overall sensitivity relative to other fish species (Hawkins & Johnstone 1978, cited by Gill & Bartlett 2010, Harding *et al.* 2016). A recent study of the hearing ability of sea lamprey (*Petromyzon marinus*) reported that, consistent with fish lacking a swim bladder, sea lamprey showed a limited sensitivity to sound, with juveniles detecting tones of 50-300Hz, but not higher frequencies (Mickle et al., 2019).

SACs and SPAs with qualifying interests which are noise sensitive (marine mammals, migratory fish, diving birds) where the site boundary is within 15km of the survey area or where foraging ranges (Zone of Influence) may bring such qualifying interests to within this distance were screened in.

2.4.4 Oil spillage

The surveys will result in a marginal increase in levels of marine traffic and therefore could theoretically increase the risk of accidents and potentially spillage of marine diesel fuel. The survey activities will be communicated through notices to mariners and the vessels will display appropriate navigational lighting. In view of the duration and scale of activity and standard good navigation practice, the probability of a collision with another vessel is considered to be extremely low, such that diesel spillage and potential effects are not considered to be likely. Diesel contains very high levels of light hydrocarbons which evaporate quickly on release with a proportion dissolving into the water column. Evaporation can be enhanced by higher wind speeds, warmer water and air temperatures. The low asphaltene contents prevents emulsification of spilled diesel, reducing its persistence in the marine environment. A diesel spill typically disperses with eight hours which limits the

distance a slick can spread. A diesel spillage in coastal waters could reach the waters and intertidal habitats of adjacent Natura 2000 sites within 10km.

SACs and SPAs with qualifying interests (intertidal habitats, seabirds and waterfowl) where the site boundary is within 10km of the survey area (Zone of Influence) were screened in.

2.5 Identification of the relevant European sites

2.5.1 Special Areas of Conservation (SAC)

Following DEHLG 2010 guidance European sites within or adjacent to the project area and those within 15km of it were included in the Appropriate Assessment process. Sites with ecologically sensitive receptors which were greater than 15km were also included. Similarly sites which may be effected by the project based on the Source-Pathway-Receptor model were also considered (OPR 2021).

Dundalk Bay SAC is 4.5km from the survey area, likely significant effects on the Annex I habitats Estuaries [1130] and Mudflats and sandflats not covered by seawater at low tide could not be discounted [1140]. Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the coastal Annex I habitats for which this site is designated. However likely significant effects on the coastal habitat of Annual vegetation of drift lines [1210] could not be discounted in Carlingford Shore SAC.

The survey area lies within the large Celtic and Irish Seas harbour porpoise management unit which encompasses the majority of coastal waters of Ireland, in addition to those of Wales, south-west and north-west England and south-west Scotland (IAMMWG 2021). Relevant SACs are Roaringwater Bay and Islands SAC, Blasket Islands SAC, Rockabill to Dalkey Island SAC, Bristol Channel Approaches SAC, North Anglesey Marine SAC, West Wales Marine and North Channel SAC. There are two SACs within the relevant management unit of the Irish Sea where Bottlenose dolphin is a qualifying feature (Cardigan Bay SAC and Lleyn Peninsula and the Sarnau SAC).

For seals there are three SACs which fall within the Zone of Influence of the project. Grey and harbour seals are qualifying features of Lambay Island SAC, with harbour seal being a qualifying interest of Murlough SAC and Strangford Lough SAC both of which are in Northern Ireland.

The migratory fish Atlantic salmon and River lamprey are qualifying interests of the River Boyne and River Blackwater SAC. While river lamprey are an anadromous qualifying interest of the River Boyne and River Blackwater SAC, they are likely to be found in estuarine waters rather than offshore, and are unlikely to be present in any significant numbers in the survey area. For salmon there is the potential for interaction with the survey area, though any direct interaction with activities would be limited to where the timing of the survey coincided with that of fish returning to their natal rivers or smolts migrating to sea.

Diesel spillage from vessel collision could reach the Dundalk Bay SAC and the Carlingford Shore SAC.

Table 2.1 Special Area of Conservation identified using Source-Pathway-Receptor model for further consideration. Features screened in for further consideration are indicated in red.

European Site	List of Qualifying Interest/ Special Conservation Interest	Distance from proposed project (km)	Source-Pathway-Receptor Connections	Considered further in screening N/Y
Dundalk Bay SAC [IE000455]	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410]	4.5km	Diesel spillage from vessel collision may reach the marine Annex I habitats. Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the coastal Annex I habitats within the site.	Habitats 1130 and 1140 are screened in
Carlingford Shore SAC [IE002306]	Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220]	4.5km	Diesel spillage from vessel collision.	Habitat 1210 is screened in
Lambay Island SAC [IE0000204]	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Halichoerus grypus (Grey Seal) [1364] Phoca vitulina (Harbour Seal) [1365]	43km	Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals. Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site.	Grey seal and Harbour seal are screened in

Roaringwater Bay & Islands SAC [IE000101]	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] Phocoena phocoena (Harbour Porpoise) [1351] Lutra lutra (Otter) [1355] Halichoerus grypus (Grey Seal) [1364]	417km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site. Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
Blasket Islands SAC [IE0002172]	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] Phocoena phocoena (Harbour Porpoise) [1351] Halichoerus grypus (Grey Seal) [1364]	544km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site. Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
Rockabill to Dalkey Island SAC [IE0003000]	Reefs [1170] Phocoena phocoena (Harbour Porpoise) [1351]	30km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site.	Harbour Porpoise is screened in

			Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	
River Boyne and River Blackwater SAC [IE002299]	Alkaline fens [7230] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Lampetra fluviatilis (River Lamprey) [1099] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355	11km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site. Potential effects on migratory diadromous fish.	Atlantic salmon is screened in
Strangford Lough SAC [UK0016618]	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonizing mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae [1330] Phoca vitulina (Harbour Seal) [1365]	53km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site. Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour seal is screened in
Murlough SAC [UK0016612]	Sandbanks which are slightly covered by sea water all the time [1110] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	23km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified	Harbour seal is screened in

	Embryonic shifting dunes [2110] "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")" [2120] Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] Phoca vitulina (Harbour Seal) [1365]		for the Annex I habitats within the site. Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	
Bristol Channel Approaches SAC [UK0030396]	Phocoena phocoena (Harbour Porpoise) [1351]	283km	Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
North Anglesey Marine SAC [UK0030398]	Phocoena phocoena (Harbour Porpoise) [1351]	56km	Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
West Wales Marine SAC [UK0030397]	Phocoena phocoena (Harbour Porpoise) [1351]	137km	Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
North Channel SAC [UK0030399]	Phocoena phocoena (Harbour Porpoise) [1351]	47km	Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Harbour Porpoise is screened in
Cardigan Bay SAC [UK0012712]	Sandbanks which are slightly covered by sea water all the time [1110] Reefs [1170] Submerged or partially submerged sea caves [8330] Bottlenose dolphin [1349]	197km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site.	Bottlenose Dolphin is screened in

			Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	
Lleyn Peninsula and the Sarnau SAC [UK0013117]	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Coastal lagoons [1150] Large shallow inlets and bays [1160] Bottlenose dolphin [1349]	135km	Given the nature and scale of potential physical disturbance associated with survey activities, no impact pathway was identified for the Annex I habitats within the site. Collision with survey vessels and disturbance from underwater noise are a potential effects on marine mammals.	Bottlenose Dolphin is screened in

2.5.2 Special Protection Areas (SPA)

Waterbirds

Physical disturbance of seaduck and other waterbird flocks by vessel traffic is possible but for all SPAs, other than Dundalk Bay SPA, the distance from the survey vessel at which flushing of birds could take place, approximately 4km, is less than the distance from the proposed survey.

Surveys carried out in the site investigation area recorded few waterbirds here. The Common scoter were recorded in relatively high abundance in April, although the birds were concentrated at the seaward edge of Dundalk Bay to the north of the proposed works area. Peak counts of Red-throated diver (10) and Great northern diver (268) were recorded by APEM (2020), with few or no birds recorded in the other survey months, indicating their wintering presence in the area. Similarly cormorant were recorded in low numbers with nine recorded in June 2020 declining to one in August and September.

Seabirds

The mean maximum foraging range has be used to relate breeding seabird colony SPAs to a survey area. Using this method in many cases may give a predicted foraging area around the colony that is too large to be a useful management tool. Seabird density declines with distance from the colony with density-dependent competition, coastal morphology and habitat preferences (Wakefield *et al.,* 2017) for example mean that seabird distributions are highly non-uniform. Also certain species of seabird are highly pelagic and are unlikely to move large distances over land. Species foraging range changes depending of life stages and can be substantially lower when rearing chicks.

The SPAs and the qualifying interests which may be effected by the identified pressures as a result of the proposed works are listed in Table 2.

Table 2: Special Protection Areas screened in for further consideration.

Site Name	Relevant qualifying interests	Physical disturbance	Physical presence	Underwater noise	Pollution
Saltee Islands IE0004002	Northern gannet	X	X	✓	X
Puffin Island IE0004003	Manx shearwater	X	X	✓	X
Skelligs IE0004007	Manx shearwater	X	X	✓	X
Blasket Islands IE0004008	Manx shearwater	X	X	✓	X
Dundalk Bay IE0004026	Common scoter	X	✓	✓	✓
	Red-breasted merganser	X	✓	✓	✓
	Great crested grebe	X	✓	✓	✓
Carlingford Lough IE0004078	Light-bellied Brent Goose	X	X	X	✓
Lambay Island IE0004069	Razorbill	X	✓	✓	X
	Atlantic puffin	X	✓	✓	X
	Common guillemot	X	✓	✓	X
Ireland's Eye IE0004117	Razorbill	X	✓	✓	X
	Common guillemot	X	✓	✓	X
Cruagh Island IE0004170	Manx shearwater	X	X	✓	X
Deenish Island and Scariff Island IE0004175	Manx shearwater	X	X	✓	X
Carlingford Lough UK9020161	Light-bellied Brent Goose	X	X	X	✓
	Sandwich Tern	X	X	X	✓

	Common Tern	X	X	X	✓
Copeland Islands UK9020291	Manx shearwater	X	X	✓	X
Irish Sea Front UK9020328	Manx shearwater	X	X	✓	X
Ailsa Craig UK9003091	Northern gannet	X	X	✓	X
Rum UK9001341	Manx shearwater	X	X	✓	X
St Kilda UK9001031	Manx shearwater	X	X	✓	X
Aberdaron Coast and Bardseys Island UK9013121	Manx shearwater	X	X	✓	X
Grassholm UK9014041	Northern gannet	X	X	✓	X
Skomer, Skokholm and the Seas off Pembrokeshire UK9014051	Manx shearwater	X	X	✓	X

In summary, the following 33 European sites are screened in for assessment of likely significant effects:

- Dundalk Bay SAC
- Carlingford Shore SAC
- Lambay Island SAC
- Roaringwater Bay & Islands SAC
- Blasket Islands SAC
- Rockabill to Dalkey Island SAC
- River Boyne and River Blackwater SAC
- Strangford Lough SAC
- Murlough SAC
- Bristol Channel Approaches SAC
- North Anglesey Marine SAC
- West Wales Marine SAC
- North Channel SAC
- Cardigan Bay SAC
- Lleyn Peninsula and the Sarnau SAC
- Saltee Islands SPA
- Puffin Island SPA
- Skelligs SPA
- Blasket Islands SPA
- Dundalk Bay SPA
- Carlingford Lough SPA
- Lambay Island SPA
- Ireland's Eye SPA
- Cruagh Island SPA
- Deenish Island and Scariff Island
- Carlingford Lough SPA
- Copeland Islands SPA
- Irish Sea Front SPA
- Ailsa Craig SPA
- Rum SPA
- St Kilda SPA
- Aberdaron Coast and Bardsey Island SPA
- Grassholm SPA
- Skomer, Skokholm and the Seas off Pembrokeshire SPA

2.6 Assessment of Likely Significant Effects

2.6.1 Physical disturbance to seabed

Physical disturbance of the seabed from the site investigations as outlined in section 2.3 will be localised and temporary in nature and will not take place in Dundalk Bay SAC. The maximum tidal excursion in Dundalk Bay is *ca.*3.5km and therefore sediment plumes as a result of these activities will not reach the Annex I habitats of Estuaries and Mudflats and sandflats not covered by seawater at low tide for which this site is designated.

Therefore significant effects on Annex I habitats as a result of the proposed works **can be excluded**.

2.6.2 Physical presence of survey vessel

Birds

The physical presence of the survey vessel may potentially cause displacement and/or other behavioural responses in birds. Most species from relevant SPAs within foraging range of the survey area have been judged to have a low to moderate sensitivity to disturbance by shipping traffic; these include northern gannet, fulmar, common guillemot, kittiwake, Manx shearwater and gulls (Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019). While the presence of shy species, in particular Common scoter associated with Dundalk Bay SPA, have been noted in recent ornithological survey work (APEM 2020, see Section 3.4.2), these were largely aggregated some distance from the survey site. While rafting birds which are qualifying interests of the identified SPAs may move in response to vessels in transit, such effects are of low magnitude and short duration, and will represent negligible, temporary additional disturbance over other vessel movements in this area.

In view of the available evidence on the potential for the survey activities to generate disturbance to qualifying bird interests of relevant SPAs for which a potential interaction was identified, significant effects **can be excluded**.

Fish and Marine mammals

It is anticipated that behavioural response by these species to the physical presence of the survey vessels in areas of existing shipping activity will be temporary and localised. The slow movement of the vessels while working also means that collision with marine mammals will not occur. Therefore significant effects on fish or marine mammals **can be excluded**.

2.6.3 Underwater noise

Birds

Information on the underwater hearing abilities of diving birds and evidence of the effects of underwater anthropogenic noise is very limited. Studies suggest that mortality occurs when in close proximity to the event (Danil & St Leger 2011). 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. Therefore it is considered that significant effects on diving birds **can be excluded**.

Fish

The high frequency signals generated by side-scan sonar, echosounders and USBL are above the hearing range of fish. There is no evidence of mortality or potential mortal injury to fish from ship noise (Popper *et al*., 2014). While it is recognised that the presence of the vessel and some of the works themselves may cause changes to the behaviour, these will be temporary and spatial limited given the size and temporary nature of the works. It is considered that significant effects on fish **can be excluded**.

Marine Mammals The latest scientific information (Southall *et al.*, 2019 and Southall *et al*., 2021) suggest that the threshold for injure to marine mammals from geophysical surveys is higher than previously though. However, following the precautionary principle and NPWS direction, the thresholds within the guidance to manage risk of underwater noise (DAHG 2014) is used as the standard in Irish waters at present. Therefore significant effects to marine mammals from this survey **cannot be excluded**.

2.6.4 Oil spillage

The survey vessels will meet all relevant MARPOL requirements in relation to Annex I on the prevention of pollution by oil, under the Sea Pollution Act 1991 (as amended). The vessels will hold a Shipboard Oil Pollution Emergency Plan (SOPEP). While surveys will marginal increase marine traffic in the area the vessels will display the appropriate navigational lighting and notices to mariners of the works will be issued. Therefore the likelihood of collision with another vessel and spillage of fuel is extremely low. However since a nearshore spillage could reach a number of European sites within the Zone of Influence **significant effects could not be excluded for Dundalk Bay SAC, Carlingford Shore SAC, Dundalk Bay SPA and Carlingford Lough SPA.**

2.7 In-combination effects

The temporary presence of the survey vessel in the area which a transit route for fishing boats, cargo vessels, as well as passenger, recreation and other vessel is not likely to result in in-combination effects.

Within this general area a number of applications have been submitted for site investigation works for potential offshore windfarm developments. These developments are at a very early stage in this process and no definitive schedule of works is available. However as the works are likely to be similar in nature the possibility of **in-combination effects**, particularly in relation to underwater noise, **cannot be excluded**.

3 Consultation with Public and Prescribed bodies

Public consultation occurred between 15th of December 2021 and 27th of January 2022. The following relevant prescribed bodies were consulted:

- Marine Survey Office
- Inland Fisheries Ireland
- National Parks & Wildlife Service
- Underwater Archaeology Unit (UAU)
- Louth County Council
- Marine Institute
- Dept. of Agriculture, Food & the Marine – Foreshore Section
- Dept. Housing, Local Government & Heritage – Marine Advisor (Engineering) and Marine Advisor (Environment)

Table 1 Prescribed Bodies and Public comments and the response of Oriel Ltd.

Prescribed Body Submission	Response from Oriel Ltd.	Comment
Dept. of Agriculture, Food & the Marine – Foreshore Please include the following condition in any site investigation licence that issues:- Should a pollution incident occur, the applicant must contact SFPA Howth immediately so protective measure can be put in place to avoid potentially contaminated shellfish being placed on the market or food chain. The contact details are sfpahowth@sfpa.ie and direct contact is be made to both shellfish managers for the area, Declan Mac Gabhann 0879294673 and Philip West 0858708312. Please note the comments of this Department's Engineering Division and also BIM :- It is noted by the Department's Engineering Division, that there are increasing numbers of proposals for the Irish Sea and that as with those applications, appropriate monitoring and measures and best practice must be followed to ensure that the proposed survey works do not cause any direct or cumulative negative impacts on environmental sites, aquaculture and fishery harbour operations. Aquaculture clients of BIM are considering new offshore licences near Cooley Point which is closer to the Wind Farm investigation zone and this application could affect these going forward. From an inshore fisheries perspective there is substantial fishing effort for lobster, crab and razor clams in the area outlined for site investigation in this application. The potential impact of the survey methods on these species must be taken account by Oriel Windfarm Ltd. BIM if aware of engagement by the applicant with a newly formed potting group, representing 13 vessels but we would suggest that the applicant engage and keep all fishers, aquaculture establishments, the NE Regional Inshore Fisheries Forum (RIFF) and the Carlingford Lough Co-ordinated Local	***Proposed Condition*** Oriel notes the condition proposed by the Department and confirms that it will ensure that it and its contractors will comply with this requirement. ***Environmental Sites, Aquaculture and Fisheries*** Oriel notes that mitigation measures to ensure that there are no direct or cumulative impacts on Natura 2000 sites are described in Section 3.4 of the NIS, which accompanied the licence application. The assessment of in-combination effects on Natura 2000 environmental sites, in Section 3.3 of the NIS, concluded that the other proposed surveys and shipping in the area were not likely to result in significant in-combination effects. The Non-statutory Environmental Report, which accompanied the licence application, in Section 5.6.1.4 noted that there are no aquaculture sites in the survey area. The nearest licensed aquaculture sites are in Carlingford Lough. However, Oriel will check the register of licensed aquaculture sites, on the government website Aquaculture Sites - Datasets - data.gov.ie before the site investigations commence. If new sites are licensed in the area of the site investigation, Oriel will liaise with the operator. The Non-statutory Environmental Report addressed the potential impacts of the proposed site investigation on commercial fishing, in Section 6.1.1. The mitigation measures proposed to minimise impacts on commercial fishing were described in Section 7.1.1. These include: • Oriel has appointed a fisheries liaison officer, who engages with all relevant fishing organisations and holds meetings with the local fishing community to provide details of planned surveys, gather information on existing fishing activity in the area and determine the potential for interaction. Appropriate actions will be taken to avoid or minimise interactions with ongoing fishing activities in the area during the course of the surveys. • The Sea Fisheries Protection Authority (SFPA) will be notified in advance of works so that small local fishing vessels can be informed of the works.	In-combination effects have been considered. Oriel Ltd. has stated that it *"will maintain awareness of the scheduling associated with these other licences, and engage with the licence holders, as required."*

Aquaculture Management Systems Group (CLAMS) informed of their activities on an on-going basis.	• Information regarding survey works will be communicated via Marine Notices, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings in advance of and during survey works. • Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out. The conclusion of the assessment of the impact on commercial fishing, in Section 8.1.1, was: *"Following implementation of the mitigation measures proposed and given the scale and duration of the proposed survey works, as well as presence of extensive alternative fishing grounds available in the wider area, the effect on commercial fisheries will be confined to a small portion of the survey area at any one time and is expected to be negative, temporary, in the case of the survey vessels, short term in the case of the static equipment, and not significant."*	
Dept. of Agriculture, Food & the Marine – Foreshore Please include the following condition in any site investigation licence that issues:- Should a pollution incident occur, the applicant must contact SFPA Howth immediately so protective measure can be put in place to avoid potentially contaminated shellfish being placed on the market or food chain. The contact details are sfpahowth@sfpa.ie and direct contact is be made to both shellfish managers for the area, Declan Mac Gabhann 0879294673 and Philip West 0858708312. Please note the comments of this Department's Engineering Division and also BIM :- It is noted by the Department's Engineering Division, that there are increasing numbers of proposals for the Irish Sea and that as with those applications, appropriate monitoring and measures and best practice must be followed to ensure that the proposed survey works do not cause any direct or cumulative negative impacts on environmental sites, aquaculture and fishery harbour operations.	***Proposed Condition*** Oriel notes the condition proposed by the Department and confirms that it will ensure that it and its contractors will comply with this requirement. ***Environmental Sites, Aquaculture and Fisheries*** Oriel notes that mitigation measures to ensure that there are no direct or cumulative impacts on Natura 2000 sites are described in Section 3.4 of the NIS, which accompanied the licence application. The assessment of in-combination effects on Natura 2000 environmental sites, in Section 3.3 of the NIS, concluded that the other proposed surveys and shipping in the area were not likely to result in significant in-combination effects. The Non-statutory Environmental Report, which accompanied the licence application, in Section 5.6.1.4 noted that there are no aquaculture sites in the survey area. The nearest licensed aquaculture sites are in Carlingford Lough. However, Oriel will check the register of licensed aquaculture sites, on the government website Aquaculture Sites - Datasets - data.gov.ie before the site investigations commence. If new sites are licensed in the area of the site investigation, Oriel will liaise with the operator. The Non-statutory Environmental Report addressed the potential impacts of the proposed site investigation on commercial fishing, in Section 6.1.1.	In-combination effects have been considered. Oriel Ltd. has stated that it *"will maintain awareness of the scheduling associated with these other licences, and engage with the*

Aquaculture clients of BIM are considering new offshore licences near Cooley Point which is closer to the Wind Farm investigation zone and this application could affect these going forward. From an inshore fisheries perspective there is substantial fishing effort for lobster, crab and razor clams in the area outlined for site investigation in this application. The potential impact of the survey methods on these species must be taken account by Oriel Windfarm Ltd. BIM if aware of engagement by the applicant with a newly formed potting group, representing 13 vessels but we would suggest that the applicant engage and keep all fishers, aquaculture establishments, the NE Regional Inshore Fisheries Forum (RIFF) and the Carlingford Lough Co-ordinated Local Aquaculture Management Systems Group (CLAMS) informed of their activities on an on-going basis.	The mitigation measures proposed to minimise impacts on commercial fishing were described in Section 7.1.1. These include: • Oriel has appointed a fisheries liaison officer, who engages with all relevant fishing organisations and holds meetings with the local fishing community to provide details of planned surveys, gather information on existing fishing activity in the area and determine the potential for interaction. Appropriate actions will be taken to avoid or minimise interactions with ongoing fishing activities in the area during the course of the surveys. • The Sea Fisheries Protection Authority (SFPA) will be notified in advance of works so that small local fishing vessels can be informed of the works. • Information regarding survey works will be communicated via Marine Notices, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings in advance of and during survey works. • Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out. The conclusion of the assessment of the impact on commercial fishing, in Section 8.1.1, was: *"Following implementation of the mitigation measures proposed and given the scale and duration of the proposed survey works, as well as presence of extensive alternative fishing grounds available in the wider area, the effect on commercial fisheries will be confined to a small portion of the survey area at any one time and is expected to be negative, temporary, in the case of the survey vessels, short term in the case of the static equipment, and not significant."*	*licence holders, as required."*
Department of Housing, Local Government, Heritage – Marine Advisor (Environment) In principle I have no objections to this application. On completion of the Second Consultation and the work of the IEC, I will furnish my final report with determinations, which may include any case specific conditions will follow having regard to the information obtained during public participation.	Oriel notes the observation of the Marine Advisor – Environment.	

Public Submissions	Response from Oriel Ltd.	Comments
Irish Whale and Dolphin Group ***General*** The Irish Whale and Dolphin Group (IWDG) was established in December 1990 and is an All-Ireland group "dedicated to the conservation and better understanding of cetaceans (whales, dolphins and porpoises) in Irish waters through study, education and interpretation". While the IWDG is primarily concerned with cetaceans we have broadened our comments to include all marine mammals. IWDG welcomes the opportunity to comment on this foreshore licence. ***Ultra High Resolution Seismic (UHRS)*** Page 9- UHRS does not consider the use of airguns with lower frequency output. Furthermore the parameters given for boomers and sparkers do not cover the Applied Acoustics Squid 500/2000 and the Applied Acoustics S-Boom with a source level of 222dB. Nor does it cover the Huntec boomer with frequencies of 0.5 to 8 kHz. The exact impact of higher frequency sources remains largely unknown. ***Ultra Short Baseline (USBL) and Multibeam Systems*** Page 9- USBL. Most Kongsberg systems use frequencies between 21 and 31 kHz (see https://www.kongsberg.com/maritime/products/Acoustics-Positioning-and-Communication/acoustic-positioning-systems/hipap-models/). The Sonardyne Wideband Sub-Mini 6 Plus (WSM6+) and Sonardyne Type 8300 Compatt 6 operate and from 19 to 34 kHz (see https://www.sonardyne.com/wpcontent/uploads/2021/06/Sonardyne_8370_WSM6-1.pdf and https://www.strsubsea.com/uploads/Sonardyne-8300-3111-Compatt-6.pdf). Therefore the stated frequencies of typical	Oriel notes the submission of the Irish Whale and Dolphin Group. ***Ultra High Resolution Seismic (UHRS)*** Oriel confirms that an Airgun will not be used. Currently, the preferred geophysical survey contractor has proposed to use a GSO 180 Sparker with dominant frequencies listed as between 400 - 1800 Hz and 200-1000 joules energy. Specification sheets can be shared. Sparker sub-bottom profilers (SBPs) generate sounds of similar characteristics to airguns, and therefore the evidence of effects relating to airguns can be applied to these sources with more confidence than others. While larger sparker SBPs operated at high energy may result in comparable source levels to a mini airgun, sparker SBPs generate energy at lower amplitudes than even small airgun arrays and consequently potential effects on marine species can be expected to be proportionally lower. Work to quantify the emitted sound fields from sparker SBPs is ongoing, but initial results support the assumption of a reduced potential of effects on marine mammals (Halvorsen & Heaney 2018, cited in the AA Screening document.). ***Ultra Short Baseline (USBL) and Multibeam Systems*** Oriel confirms that the typical frequencies of the USBL will be 19 to 34 kHz. This revision in frequency range is not considered to affect the conclusions of the assessment made in respect of effect on marine fauna. For the Sonardyne Type 8370-1111 beacon the source level under battery power is given as 184 dB re. 1 µPa @ 1 m which is less than the source level given and assessed in the AA Screening (~200dB re 1µPa @1m (peak). Oriel confirms that the currently proposed multibeam system uses 400-700 kHz, not the frequency range quoted in application (70-100kHz). Lower frequency "high power" MBES systems typically have source levels approximately 10 dB higher than systems operating at >100 kHz (Hildebrand, 2005). Hildebrand, J. A. (2005). Impacts of anthropogenic sound. In: Reynolds JE, Perrin WF, Reeves RR, Montgomery S, Ragen TJ (eds) *Marine mammal research: conservation beyond crisis*. Baltimore: Johns Hopkins University Press pp 101-124.	Section 7.2.2 of the Non-statutory Environmental report dated 17 November 2021 states that *"Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters*" (DHAG 2014) will be implemented as best practise guidelines for geophysical surveys and

frequencies of 20 to 40 kHz should reflect the real numbers and the examples given of 19 to 34 kHz. Page 35 Table 4.4. USBL source level should be considered to have a maximum source level of 206 dB re 1µPa@1m and not 200dB. See page 53 Kongsberg (2016) Product Description. Boomer or sparker comments as for page 9. Multi-beam systems lower than 70 kHz should not be allowed on surveys as these use higher source levels and may need appropriate review before use ***High Resolution Geophysical Surveys*** Page 18. Suggests that disturbance of from HRGS (High Resolution Geophysical Surveys) would be limited to a few hundred metres from source for marine mammals. This is not what is suggested by a review document published by the JNCC (2020) which suggests a zone of disturbance of 5km. ***Low Frequency Baleen Whales*** Page 38 Table 4.3. Low Frequency baleen whales (Southall et al, 2019) should be included inconsideration of functional hearing groups as minke or humpback whales may be present in the site area. ***Mitigation Measures*** The document does not mention mitigation measures that will be employed during geophysical and geotechnical surveys. This is not compliant with requirements by the NPWS and DAHG (2014) guidelines. As the assessment does not mention any mitigation measures that will be applied it should not proceed currently. The assessment should recognize the requirement for mitigation measures in the surveys suggested and must be included in the assessment.	***High Resolution Geophysical Surveys*** Various JNCC reports (e.g. 2020, 2021) repeat recommended effective deterrence ranges (EDRs) for harbour porpoises from noise from a range of activities. These are considered very conservative and do not necessarily reflect the latest evidence; for example, piling has a 26km EDR which was questioned by Graham et al. (2109) and Benhemma-Le Gall et al. (202 For HRGS, the JNCC reports recommend a 5km EDR in relation to the porpoise features of Special Areas of Conservation; this too does not correspond to the evidence presented by Halvorsen & Heaney (2018), cited and reflected in the AA Screening document. Benhemma-Le Gall, A., Graham, I. M., Merchant, N. D. and Thompson, P. M. (2021). Broad-Scale Responses of Harbor Porpoises to Pile-Driving and Vessel Activities During Offshore Windfarm Construction. Front. Mar. Sci. 8: 664724 doi: 10.3389/fmars.2021.664724 Graham, I. M., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Bono, S., and Thompson, P. M. (2019). Harbour porpoise responses to pile-driving diminish over time. R. Soc. open sci. 6, 190335. http://dx.doi.org/10.1098/rsos.190335 JNCC (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). JNCC Report No. 654, Joint Nature Conservation Committee, Peterborough, ISSN 0963-8091. https://data.jncc.gov.uk/data/2e60a9a0-4366-4971-9327-2bc409e09784/JNCC-Report-654-FINAL-WEB.pdf JNCC (2021). Impulsive noise in the Southern North Sea SAC (2015 to 2020). Joint Nature Conservation Committee final report to Defra. http://sciencesearch.defra.gov.uk/Document.aspx?Document=15220_JNCC2021_NoiseHpSACs_JNCC-Final.pdf ***Low Frequency Baleen Whales*** Table 4.3 provides details of the relevant marine mammals (i.e., those which are qualifying interests of relevant sites) and auditory injury criteria to impulsive and non-impulsive noise by functional hearing group. No sites for baleen whales are within the zone of influence for the survey and thus they were not included in this table. However, baleen	a qualified and experience d marine mammal observer (MMO) will be employed aboard the survey vessels during all multibeam, single beam, side-scan sonar and sub-bottom profiling. MMO monitoring will include pre-start monitoring, 'soft-start' ramp-up procedures, line change procedures and procedure

	whales are considered in the assessment and their auditory injury criteria are included in Table 6.2. ***Mitigation Measures*** The mitigation measures to be implemented for marine mammals are described in Section 7.2.2 of the Non-statutory Environmental Report. Oriel confirms that the best practice guidelines, "*Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters*" (DAHG 2014), will be implemented in full for the geophysical surveys and a qualified and experienced marine mammal observer (MMO) will be employed aboard the survey vessels during all multibeam, single beam, side-scan sonar and sub-bottom profiling. The European Court of Justice has ruled, "in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site" (Case C-323/17.) Consequently, mitigation measures must not be included in Appropriate Assessment screening. This is the reason why there is no reference to compliance with the DAHG 2014 guidance in the report Supporting information for the Stage 1 Screening for Appropriate Assessment, which was submitted with the licence application.	for a break in sound output.
National Inshore Fishermen's Association (NIFA) and the National Inshore Fishermen's Organisation (NIFO) **4.2.1 Submission** With reference to planning application reference number FS007383, by Oriel Windfarm Limited, Digital Office Centre, Balheary Road, Swords, Co. Dublin, K67 E5A0, The National Inshore Fishermen's Association (NIFA) and the National Inshore Fishermen's Organisation (NIFO) wish to make the following joint submission. ***Pre-Application Consultation*** Members inform of very limited or no pre application consultation, and as Organisations we only discovered detail of it having searched through the various consultations on the Gov.ie website. This coupled with the timing of the	***Pre-Application Consultation*** Oriel has been in continuous engagement with local fishing organizations that represent commercial fishers that are active in the area over the past three years. These include, Clogherhead Fisherman's Association, Clogherhead Fisherman's Coop, Dunany Lobster and Crab Association, Anglo Northern Ireland Fisherman's Organisation (ANIFPO), and Northern Ireland Fisherman's Organisation (NIFPO). All fishermen that fish within the foreshore licence area are represented by one or other of these associations. Oriel is aware of a small number of fishing vessels that operate from Kilkeel Harbour, that fish for prawn and scallop in the area adjacent and to the east and south of the Foreshore licence application area that are not members of one of the above organisations, Oriel's fisheries	

consultation, over the Christmas period, a time where inshore fishers typically take some time off, has made it difficult to put a considered response together or gauge the potential impact this project will have on members. Members that have raised, what we feel are valid concerns regarding this application. ***Fishing Activity in the Area*** The area in question is important in general to Inshore Commercial fishing, primarily using towed gear mostly demersal trawling for prawns but also scallop dredging. For some of our members the area in question accounts for a significant amount of their economic activity. Their activity there is well established and traditional. Members concerned operate small vessels, typically between seven and twelve meters in length, given the size of these vessels and the nature of fishing activity in the broader general area, operating elsewhere, to where the traditionally have done, is not realistically a viable option for them, even on short term basis. ***Potential Disruption to Fishing Activities*** While we appreciate this application is for site investigation works, our members are concerned that these works will disrupt their fishing operations and this disruption will have a negative economic impact on them. The extent of that disturbance is still unknown and will likely vary between members. Given the density of fishing activity, both in this specific and adjacent areas and the nature of the survey work, disruption is highly likely, and may involve static gear operators having to move gear, to avoid damage or loss to it, in advance of the survey. Previous experience with similar applications has proved this to be the case. Our position is than any disruption should be kept to an absolute minimum. Given that avoiding this disruption completely is highly unlikely and given the principles of "avoid, minimise or mitigate" detailed in the National Marine Planning	liaison officer has been in direct contact with a representative of these individuals. All of these organisations were directly contacted by Oriel's Fisheries Liaison Officer in advance of the foreshore licence application submission. The public consultation for the licence application was open for a 6-week period from 15th December 2021 to the 27th of January 2022. The Foreshore licence application was also advertised in local and national newspapers, all local councillors were informed, and the Public Participation Network issued a notice to a list of over 300 community groups in the area. The Oriel project has been in development for over 15 years and there have been multiple and consistent public engagements and consultations on the project over this time period, including a 6-week public consultation held in February 2021 which received widespread media coverage at the time. Oriel is committed to pursuing a coexistence agreement with the local fishing community and has established a Fisheries Fund to support the sustainability of the fishery in the area which is open to commercial fishing interests active in the area. ***Fishing Activity in the Area*** The location of the Oriel Wind Farm has taken account of the valuable prawn and scallop fishery in the area. This fishery is located within the soft mud sediments to the east and south of the foreshore licence application area. The location of this fishery was one of the constraints used in identifying a suitable location for the wind farm, which has been located on hard seabed sediments outside of this fishing area. As outlined in Section 7 of the Non-Statutory Environmental Report, the presence of survey vessels and static equipment, and the exclusion zones around them, will may cause temporary loss or restrict access to fishing grounds for static fishing gear and will may temporarily displace fishing activity to other areas.	

Framework (NMPF), we ask that consent to proceed be withheld until a Fisheries Management and Mitigation Strategy (FMMS) agreed with our relevant members. This FMMS needs to be designed to keep displacement of activity to an absolute minimum, but where displacement occurs and in turn has a negative impact on members working outside of the area, the FMMS and agreement needs to take these members into account also. ***Potential Effects Following Completion of the Survey*** Again acknowledging that the application is for site investigation works, members have concerns that these works will have a negative effect that will be longer lasting than the duration of works. These concerns are based on previous experience for similar site investigation works off the East Coast. The above mentioned FMMS needs to take these concerns into account also. In particular they are concerned about the effects of using a sub bottom acoustic profiler, in water as shallow as this will have on the shellfish population. In general the opinion of the Fishing industry is that offshore seismic survey work has a negative effect on catch rates for some time after a survey has been carried out in an area. While we acknowledge the intensity of the proposed acoustic work is far lower than that used for offshore oil and gas exploration, members are concerned that the fact that the water is much shallower in this area will mitigate against this. For members concerned, Shellfish fisheries are the most important fishery to them. Any negative effect on the shellfish stocks that support these fisheries in the short, medium or long term, could be economically detrimental to them. Again acknowledging that this application is only for site investigation work members are concerned with the unknown long term effects such developments may have particularly given the amount of interest in ORE development in the general area and the	However, if a Foreshore Licence is granted, the Oriel will implement measures to ensure this displacement is kept to a minimum and that the effects on commercial fishing are not significant. Oriel has appointed a fisheries liaison officer, who engages with all relevant fishing organisations and holds meetings with the local fishing community to provide details of planned surveys, gather information on existing fishing activity in the area and determine the potential for interaction. Appropriate actions will be taken to avoid or minimize interactions with ongoing fishing activities in the area during the course of the surveys. In addition, the Sea Fisheries Protection Authority (SFPA) will be notified in advance of works so that small local fishing vessels can be informed of the works. Information regarding survey works will be communicated via Marine Notices, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings in advance of and during survey works. Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out. ***Potential Disruption to Fishing Activities*** The site investigation works will be designed to minimise disruption to fisheries operations and Oriel will undertake extensive engagement the local fishers through the fishing organisations prior to the commencement of all works as detailed in the response above. This engagement will seek to minimise the potential for displacement of fishing activities during the works. ***Potential Effects Following Completion of the Survey*** Compared to marine mammals there is relatively limited evidence on the effects on underwater noise on seabed invertebrates. Seabed vibrations from anthropogenic activities such as geophysical surveys and piling may also induce a response. The blue mussel *Mytilus edulis* has been shown to respond to substrate-borne vibrations by partially or fully closure of their valve; depending on duration this may have consequences for their fitness (Roberts *et al*. 2015). In a similar experiment, the hermit crab *Pagurus bernhardus* responded	

cumulative effects these potential developments will have combined.	behaviourally to substrate-borne vibrations (Roberts *et al.* 2016). From these studies however, extrapolations of effects in the wild are limited by the challenges of reproducing, controlling and measuring exposure level in small tanks, especially with respect to particle motion (Popper & Hawkins 2018). Various oil industry seismic and other geophysical surveys have been undertaken in shallow water areas around the UK (e.g., Poole Bay, Weymouth Bay, the Moray Firth) which have important shellfisheries (both crustacean and bivalve), none has been found to adversely affect the shellfish stocks. Popper, A. N. & Hawkins, A. D. (2018). The importance of particle motion to fishes and invertebrates. Journal of the Acoustical Society of America 143: 470-488. Roberts L., Cheesman S., Breithaupt T. & Elliot M. (2015). Sensitivity of the mussel *Mytilus edulis* to substrate-borne vibration in relation to anthropogenically generated noise. Marine Ecology Progress Series 538: 185-195. Roberts L, Cheesman S., Elliot M. & Breithaupt T. (2016). Sensitivity of *Pagurus bernhardus* (L.) to substrate-borne vibration and anthropogenic noise. Journal of Experimental Marine Biology and Ecology 474: 185-194.	

4 Appropriate Assessment and Conclusions

To determine if the proposed project, alone or in-combination with other plans or projects, was likely to have significant effects on any European sites a screening for an Appropriate Assessment was undertaken. This process was carried out in accordance with the Habitats Directive and to the European Communities (Birds and Natural Habitats) Regulations 2011 and is consistent with national (OPR 2021) and EU (DEHLG 2010) guidance.

The likely significant effects from the proposed works were identified as being:

- Physical disturbance to the seafloor
- Disturbance due to the physical presence of the survey vessels
- Underwater noise
- Accidental oil spillages

A total of 33 European sites together with their site specific conservation objectives were considered. Likely significant effects from oil spillage could not be excluded for intertidal and coastal habitats and qualifying interests for the four European sites closest to the works site. Using the precautionary principle, significant effects of underwater noise on marine mammals from the geophysical surveys could not be excluded. Similar works in this area by the Offshore Renewable Sector means in-combination effects from man-made underwater noise cannot be excluded.

Therefore a Stage 2 Appropriate Assessment is required.

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