Ilen Array Offshore Wind Farm

Foreshore Licence Application for Site Investigation Works

Supporting Information for Screening of Appropriate Assessment

Document Control

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List of Abbreviations

AA	Appropriate Assessment
ADCP	Acoustic Doppler Current Profiler
API	American Petroleum Institute
BH	Borehole
CPOD	Cetacean Passive Acoustic Network
CPT	Cone Penetration Tests
DAHG	Department of Culture, Heritage and the Gaeltacht
DEHLG	Department of Housing, Local Government and Heritage
DTTAS	Department of Transport, Tourism and Sport
EC	European Commission
EMODnet	The European Marine Observation and Data Network
EPS	European Protected Species
EU	European Union
FCS	Favourable Conservation Status
INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resource
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
ISO	International Organization for Standardization
IWDG	Irish Whale and Dolphin Group
JNCC	Joint Nature Conservation Committee
LiDAR	Light Detection and Ranging
MARPOL	The International Convention for the Prevention of Pollution from Ships
MBES	Multibeam Echosounder
MI	Marine Institute
MM	Magnetometer
MMO	Marine Mammal Observer
MPA	Marine Protected Area
MAP Act	Marine Area Planning Act
MU	Management Unit
NIS	Natura Impact Statement
NM	Nautical Mile
NPWS	National Parks and Wildlife Service
NRW	Natural Resources Wales
OSPAR	Oslo and Paris Conventions
PTS	Permanent Threshold Shift
QI	Qualifying Interests
SAC	Special Areas of Conservation
SBP	Sub-Bottom Profiling
SCANS-II	Small Cetaceans in the European Atlantic and North Sea
SPA	Special Protection Areas
SPL	Sound Pressure Level
SSS	Side Scan Sonar
TTS	Temporary Threshold Shift
UHRS	Ultra-High Resolution Seismic
UK	United Kingdom
VC	Vibrocore

Glossary of Terms

Acoustic Doppler Current Profiler (ADCP)	An acoustic doppler current profiler 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.
Alkaline Fens	Alkaline fens are groundwater-fed, generally peat-forming systems with extensive areas of species-rich small sedge and brown moss communities. They occur in areas where there is a high-water table and a base-rich, often calcareous water supply.
Alluvial Forests	A number of variants of alluvial woodland habitat exist, of which riparian forests of ash (Fraxinus excelsior) and alder (*Alnus glutinosa*) (Alno-Padion) of temperate and Boreal Europe lowland and hill watercourses are the most common in Ireland. All types occur on heavy soils which are periodically inundated by the annual rise of river levels but otherwise well-drained and aerated during low water.
Alpine and Boreal Heaths	The Alpine heaths occur at high altitude above the natural altitudinal tree line, while Boreal heaths develop below the tree line in gaps within scrubby high-altitude woods or as replacements for those subalpine woods lost due to grazing and burning. Alpine and Boreal heath consists of two distinct subtypes in Ireland. The upland subtype occurs on the exposed summits and upper slopes of mountains on acidic substrate. The lowland subtype comprises Dryas heath on limestone.
Appropriate Assessment (AA)	An appropriate assessment (AA) is an assessment of the potential adverse effects of a plan or project (in combination with other plans or projects) on Special Areas of Conservation and Special Protection Areas. These sites are protected by National and European Law.
Atlantic Salt Meadows	Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient. They also contain a distinctive topography with an intricate network of creeks and salt pans occurring on medium and large-sized saltmarshes.
Blanket Bogs	Blanket bogs occur in areas of consistently high rainfall (>1,250mm and >225 rain days per annum) where the ground surface is waterlogged for much of the time, resulting in the development of deep peats.
Boreholes	A borehole is a narrow shaft bored in the ground, either vertically or horizontally.
Calaminarian Grasslands	Calaminarian grassland vegetation is characterised by the presence of metallophyte plants, i.e. plants that can tolerate high levels of heavy metals. In Ireland, this habitat is restricted to artificial habitats on spoil heaps in the vicinity of old mine workings.
Calcareous Fens	Cladium fens refers to *Cladium mariscus* beds which are in contact with species-rich vegetation of small-sedge fens (i.e. *Cladium mariscus* and species of the *Caricion davallianae*).
Calcareous Rocky Slopes	Calcareous rocky slopes habitat consists of vertical or near-vertical exposures of calcareous bedrock with cracks, fissures and overhangs that support chasmophytic vegetation (i.e. vegetation in crevices).
Coastal Lagoons	Lagoons are expanses of coastal salt water, of varying salinity, which are wholly or partially separated from the sea by sand banks or shingle, or less frequently by rocks.
Cone Penetration Test (CPT)	The cone penetration or cone penetrometer test (CPT) is a method used to determine the geotechnical engineering properties of soils and delineating soil stratigraphy.
Drift Lines	Drift lines occur on sandy or shingle substrate at the upper part of the strand, around the high tide mark. Water-borne material including organic matter is deposited on the shore and provides nutrients and a seed source for vegetation.
Ecology	Ecology is a branch of biology concerning the spatial and temporal patterns of the distribution and abundance of organisms, including the causes and consequences.
Embryonic Shifting Dunes	Embryonic shifting dunes are low sand mounds, generally less than a metre high, occurring between the high tide mark and the partially stabilised marram (white) dunes. Embryonic shifting dunes are unstable habitats where wind-blown sand is common, and they are still vulnerable to saltwater intrusion.
Environmental Receptors	Environmental receptors are any organism, habitat or natural resource which could be adversely affected by an activity.

Estuaries	Estuaries are coastal inlets with a significant freshwater influence. They are diverse, dynamic habitats that help maintain the health of coastal ecosystems. They are a significant resource for bird and mammal species for feeding, breeding and resting, and depending on their geomorphology and hydrology support a mosaic of other habitats, including Annex I habitats such as mudflats.
European Dry Heaths	Dry heath comprises vegetation dominated by ericaceous dwarf shrubs and usually occurs on well-drained, nutrient-poor and acidic mineral soils or shallow peats (typically <50cm deep) on sloping ground.
Favourable Conservation Status	The Habitats Directive requires EU Member States to achieve FCS of natural habitats and species, defined with respect to species by Article 1 (i) of the Directive as below: "conservation status will be taken as 'favourable' 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, and 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."
Fixed Coastal Dunes	Fixed dunes are relatively sheltered with sand mobility greatly reduced in comparison to fore dune habitats and have developed a more or less closed carpet of vegetation. The sandy substrate is frequently overlain by a layer of humus, and lichens and mosses are often abundant.
Foreshore	The foreshore of Ireland is classed as the land and seabed between the high water of ordinary or medium tides (shown HWM on Ordnance Survey maps) and the twelve-mile limit (12nm = 22.224km). The foreshore also covers the tidal reaches of rivers.
Foreshore Licence Application Area	An area within the 12nm boundary of the Irish coastline where a Foreshore Licence Application is submitted to the Department of Housing, Local Government and Heritage for a licence to undertake activities within that area.
Geophysical Activities	Geophysical surveys are ground-based physical sensing techniques that produce a detail image or map of an area. Ground-based surveys may include: Seismic surveys - vibrations are recorded with geophones to provide information about the properties of rocks.
Geotechnical Activities	Geotechnical investigation and evaluation methods to acquire and evaluate subsurface information, including drilling and sampling, laboratory testing, cone penetration testing, and pressure meter testing.
Grab Samples	A grab sample is a sample of sediment taken from the seabed.
Humid Dune Slacks	Dune slacks are topographically the lowest lying regions within a dune system, found in hollows or depressions either behind or between dune ridges. The waterlogged condition of the soil is an important determinant of the vegetation; the water table is usually within 1m of the surface, with diurnal, seasonal and annual fluctuations.
Large Shallow Inlets and Bays	Large shallow inlets and bays are indentations of the coast with limited freshwater influence. They vary widely in habitat and species diversity depending on their location, exposure, geology, and sediment composition, which determine their constituent habitat communities.
LiDAR	LiDAR is a method for measuring distances by illuminating the target with laser light and measuring the reflection with a sensor. Differences in laser return times and wavelengths can then be used to make digital 3-D representations of the target. It has terrestrial, airborne, and mobile applications.
Limestone Pavements	The structure of Limestone pavement habitat typically consists of blocks of rock, known as clints, separated by fissures or grikes. Sometimes due to weathering this structure is less defined, especially in the 'shattered' variant of pavement. Limestone pavement can occur as areas of exposed rock with very little vegetation or in association with grassland, heath, scrub, or woodland communities.
Lowland Hay Meadows	Lowland hay meadows are represented in Ireland by mesotrophic semi-natural grasslands that are almost always managed as traditional hay meadows (cut only once a year in late summer or autumn with the hay crop removed).
Machairs	Machairs are complex and dynamic systems which are considered natural landforms that are the product of both wind erosion and cultural activities. They are globally restricted to the north-west coasts of Ireland and Scotland.

Magnetometer	A magnetometer is a device that measures magnetism—the direction, strength, or relative change of a magnetic field at a particular location.
MARPOL	MARPOL is the main international convention aimed at the prevention of pollution from ships caused by operational or accidental causes. It was adopted at the International Maritime Organization (IMO) in 1973. The Protocol of 1978 was adopted in response to a number of tanker accidents in 1976–1977.
Mediterranean Salt Meadows	Mediterranean salt meadows occupy the upper zone of saltmarshes and usually occur adjacent to the boundary with terrestrial habitats. They are widespread on the Irish coastline; however, they are not as extensive as Atlantic salt meadows.
Metocean	Metocean conditions refer to the combined wind, wave and climate conditions as found on a certain location. They are most often presented as statistics, including seasonal variations, scatter tables, wind roses and probability of exceedance.
Molinia Meadows	Molinia meadows are represented in Ireland by both fen and grassland communities on nutrient-poor soils.
Mudflats and Sandflats	Tidal mudflats and sandflats habitat is comprised of the intertidal section of the coastline where sands and muds dominate.
Multibeam Echosounder (MBES)	An echosounder uses sound waves to measure water depth. A transducer mounted under a vessel emits a pulse which travels through the water to the seafloor and bounces back to a receiver. The time it takes for the signal to return is measured, and because the speed of sound through water) is known, the water depth under the boat is measured. This is the basic principle of hydrography and seafloor mapping. A multibeam echosounder (MBES) measures multiple echoes at a time.
Natura Impact Statement	NIS: Natura Impact Statement; the statement prepared following Appropriate Assessment of Natura 2000 sites as required under the Habitats Directive which presents information on the assessment and the process of collating data on a project and its potential significant impacts on Natura 2000 site(s).
Natural Dystrophic Lakes and Ponds	Small lakes where the water is acidic and often tinted brown due to peat are often found as part of peat bogs or heathlands (for example habitat types 4010 and 7110), particularly in western and northern Europe where this habitat is most frequent.
Natural Eutrophic Lakes	Lakes and ponds with mostly dirty grey to blue-green, more or less turbid, waters, particularly rich in dissolved bases (pH usually > 7), with free-floating surface communities of the Hydrocharition or, in deep, open waters, with associations of large pondweeds (Magnopotamion).
Northern Atlantic Wet Heaths	North Atlantic wet heath is a natural or more commonly semi-natural habitat of humid, peaty or semi- peaty character. The habitat is dominated by dwarf shrub species and usually occurs on acidic, nutrient- poor substrates, such as shallow peats (<0.5m) or sandy soils with impeded drainage.
Oligotrophic to Mesotrophic Standing Waters	Typified by habitats with *Najas flexilis*, this is a more species rich habitat than 3110. It also contains *Isoetes lacustris, Isoetes echinospora*, and *Littorella uniflora*, but combined with some broad-leaved pondweeds such as *Potamogeton perfoliatus*. While frequently associated with peatland, this habitat type is found in catchments with more mixed geology, including at least some base-rich influence and pH closer to neutral (pH 7).
Oligotrophic Waters	A habitat dominated by isoetids. Characteristic species include *Isoetes lacustris, Isoetes echinospora, Littorella uniflora*, *Lobelia dortmanna* and *Deschampsia setacea*. The habitat frequently occurs on sheltered, gently sloping shorelines. It is generally associated with peatland areas and base-poor water (pH often <6.5).
Perennial Vegetation	Vegetated shingle occurs along the coast where shingle (cobbles, pebbles, and gravel ≥2mm wide) has accumulated to form elevated ridges or banks above the high tide mark.
Petrifying Springs	Petrifying springs are lime-rich water sources where tufa is actively deposited and where characteristic species of bryophytes are dominant or abundant. The emerging spring water is rich in carbon dioxide and dissolved calcium carbonate.
Pollution Event	A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.
Foreshore Licence Application Area	Proposed area for Foreshore Licence to undertake site investigations to develop offshore windfarm and cable routes.

Receiving Environment	The receiving environment is the environment upon which a proposed activity might have effects.
Reefs	Reefs are marine features with hard substrate available for colonisation by plants and animals. In Irish waters they range from the intertidal to depths of 4,500m and more than 400km from the coast.
Sandbanks	Sandbanks are distinct banks that arise from horizontal or sloping plains of sediment that ranges from gravel to fine sand. They are primarily composed of sandy sediments permanently covered by water, at depths of less than 20m below chart datum.
Side Scan Sonar (SSS)	Side-scan uses a sonar device that emits conical or fan-shaped pulses down toward the seafloor across a wide-angle perpendicular to the path of the sensor through the water, which may be towed from a surface vessel or submarine, or mounted on the ship's hull.
Siliceous Rocky Slopes	Siliceous rocky slope habitat consists of vertical or near-vertical exposures of siliceous bedrock with clefts, crevices, fissures, and overhangs that support chasmophytic vegetation (i.e. vegetation in crevices).
Siliceous Scree	Siliceous scree habitat consists of accumulations of siliceous rock fragments on slopes below upland cliffs or on exposed / frost-shattered mountain summits or ridges.
Special Areas of Conservation	These are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. The EU Habitats Directive lists certain habitats and species that must be protected within SACs.
Special Protection Areas	Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of: Listed rare and vulnerable species, regularly occurring migratory species and wetlands especially those of international importance.
Sub-Bottom Profiler	A sub-bottom profiler is a type of sonar system that produces a 2-dimensional stratigraphic cross section by using acoustic energy to image sub-surface features in an aquatic environment.
Submerged or Partially Submerged Sea Caves	In Ireland sea caves are defined as caves which are fully submerged below sea level, or which have an intertidal component to them. The entrances of sea caves usually occur on sea cliff faces with the cave extending both above and below sea level. A number of sea caves are known to be completely submerged, others form tunnels or caverns.
Transition Mires and Quaking Bogs	Transition mires and quaking bogs are physically unstable peat-forming communities, typically occurring as swards or floating mats over saturated peat or open water. There is usually an abundant bryophyte layer.
Turloughs	A turlough is a depression in limestone areas that is temporarily flooded by groundwater in most years. Turloughs are usually flooded in winter and dry during summer, though this varies greatly with rainfall and groundwater dynamics.
Vegetated Sea Cliffs	A sea cliff is a steep or vertical slope located on the coast, the base of which is in either the intertidal or subtidal zone. Hard cliffs, composed of hard rock such as basalt, are at least 5m high, while soft cliffs, composed of softer substrates such as shale or boulder clay, are at least 3m high.
Vibrocore	Vibracoring is a sediment sampling methodology for retrieving continuous, undisturbed cores. Vibracorers can work in a variety of water depths and can retrieve core samples at different lengths depending on sediment lithology and project objectives.
Water Courses	Natural or artificial channels through which water flows.
Wave Buoy	Wave buoys are used to measure the movement of the water surface as a wave train. The wave train is analysed to determine statistics like the significant wave height and period, and wave direction.

1 Introduction

Ilen Array Ltd. provides this report in support of an application for a Licence under Section 3 of the Foreshore Act, as amended, to carry out site investigation works to determine the suitability of the site for a floating windfarm development.

Ilen Array Ltd. intends to undertake marine surveys at the Foreshore Licence Application Area in order to inform the location and design of an offshore wind farm. The marine surveys will include geophysical, geotechnical, ecological and metocean marine surveys.

1.1 Aim of this report

This report is part of the Foreshore Licence Application to the Foreshore Unit of the Department of Housing, Local Government and Heritage and includes the Appropriate Assessment process as required under the Habitats Directive (92/43/EEC).

This report aims to support the application process and provide the necessary information to the competent authorities to assist them in making an informed decision on the likely impact of this project on the receiving environment including the likely impact on Special Protection Areas, Special Areas of Conservation and their designated Annex I and Annex II species.

1.2 Structure of the Report

This report is structured into the following chapters to include information relating to the receiving environment, Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Qualifying Interests (QIs), the potential impacts and Appropriate Assessment (AA) process and other environmental receptors. Specifically, the chapters of this report are as follows:

- Chapter 2: Habitats Directive (92/43/EEC) (outlines key aspects of the process)
- Chapter 3: Identification of potential impacts on the basis of the nature of the proposed site investigation activities
- Chapter 4: Description of Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and their Qualifying Interests (QIs) considered relevant to the potential impacts identified in Chapter 3
- Chapter 5: Information in Support of Appropriate Assessment Screening (Stage 1 Screening)
- Chapter 6: Reference to Stage 2 Natura Impact Statement found in accompanying document Ilen Array Offshore Wind Farm Natura Impact Statement (NIS)

This report has been prepared by Stephen Comerford PhD. Stephen is a Marine Ecologist who has undertaken multiple environmental assessments under the Habitats Directive and has extensive experience in the offshore wind industry.

1.3 Foreshore Licence Application Area

This Foreshore Licence Application seeks consent to conduct surveys to establish the potential for offshore wind development off the coast of Co. Kerry. This is not an application for a windfarm development. The Foreshore Licence Application Area is limited to within 12 nautical miles of the coast, in keeping with the current foreshore legislation which does not provide for licences beyond that distance. The site is defined as an irregular polygon which extends approximately 76 kilometres northeast-southwest at its longest point and 23 kilometres southeast-northwest at its widest point, with the depths ranging between 0 – 103 m. The north-western boundary is defined by the Irish 12 nm limit. The Foreshore Licence Application Area for the site has a total area of 629.80 km^2. The export cable extends from the site area up the Shannon Estuary and makes landfall at three points. The area of the cable corridor is 307.14 km^2. See Figure 1-1 below, and the co-ordinates of the site extents are set out in Table 1-1.

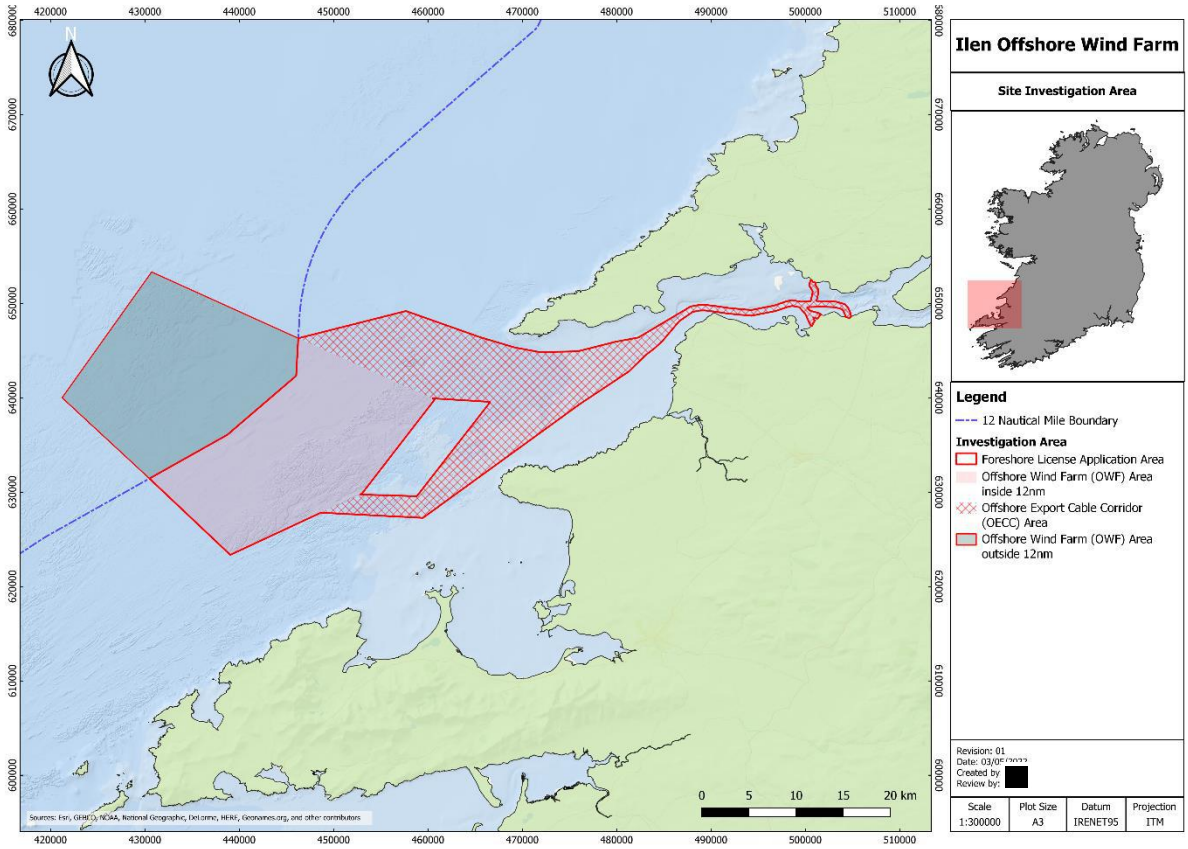

Figure 1-1: Foreshore Licence Application Area (red) and Offshore Wind Farm Area outside 12 NM (grey; for information purposes only)

Table 1-1 Foreshore Licence Application Area Coordinates

Point No.	WGS84 / UTM zone 29N EPSG:32629		WGS84 Geographic EPSG:4326		IRENET95 / Irish Transverse Mercator EPSG:2157	
	X	Y	Longitude	Latitude	X	Y
1	398534.58	5807493.87	-10.49165	52.40826	430483.70	631448.17
2	414091.21	5822564.04	-10.26690	52.54637	446254.36	646307.90
3	425459.39	5825607.96	-10.09997	52.57541	457668.32	649195.12
4	433364.32	5822938.96	-9.98281	52.55244	465538.58	646415.71
5	437007.75	5821912.04	-9.92888	52.54364	469168.83	645337.98
6	439764.57	5821439.89	-9.88815	52.53971	471919.88	644827.48
7	443721.20	5821592.09	-9.82984	52.54150	475879.72	644924.88
8	447721.76	5822663.12	-9.77103	52.55153	479896.21	645940.74
9	450116.63	5823140.76	-9.73578	52.55605	482298.34	646385.30
10	455608.70	5826509.53	-9.65523	52.58681	487838.55	649678.79
11	456554.17	5826689.24	-9.64130	52.58850	488786.75	649845.43
12	457124.41	5826705.72	-9.63289	52.58869	489357.36	649854.01
13	458178.68	5826599.20	-9.61731	52.58782	490410.42	649732.83
14	458677.05	5826530.84	-9.60995	52.58724	490907.97	649657.55
15	459629.24	5826406.45	-9.59588	52.58619	491858.66	649519.93
16	460522.32	5826328.55	-9.58269	52.58556	492750.89	649429.62
17	462022.84	5826215.27	-9.56053	52.58465	494250.21	649295.50
18	464468.59	5826731.20	-9.52449	52.58945	496703.70	649777.63
19	465633.43	5827151.09	-9.50734	52.59330	497874.64	650181.47
20	466334.68	5827329.03	-9.49700	52.59494	498578.53	650349.72
21	467271.16	5827172.52	-9.48316	52.59360	499513.06	650180.19
22	468309.21	5827222.63	-9.46784	52.59411	500552.04	650215.91
23	468408.10	5827660.49	-9.46643	52.59805	500657.03	650652.50
24	468501.11	5828124.56	-9.46510	52.60223	500756.50	651115.39
25	468511.33	5828306.40	-9.46496	52.60386	500769.24	651297.14
26	468122.04	5828911.49	-9.47077	52.60928	500388.26	651907.77
27	468249.92	5829418.79	-9.46893	52.61385	500523.20	652413.40
28	468346.50	5829532.06	-9.46752	52.61487	500621.37	652525.37
29	468820.01	5829225.14	-9.46049	52.61214	501090.74	652211.80
30	468767.21	5829017.19	-9.46125	52.61027	501035.05	652004.53
31	469121.07	5828467.16	-9.45598	52.60534	501381.36	651449.47
32	469097.55	5828048.42	-9.45628	52.60158	501352.02	651030.96
33	468994.80	5827535.75	-9.45775	52.59696	501242.13	650519.60
34	468932.23	5827257.46	-9.45865	52.59446	501175.69	650242.11
35	469171.05	5827270.78	-9.45513	52.59459	501414.75	650252.12
36	469930.60	5827270.08	-9.44391	52.59463	502174.47	650240.88

37	471044.24	5827225.35	-9.42747	52.59428	503287.74	650180.70
38	471951.63	5826971.67	-9.41405	52.59205	504191.81	649914.38
39	472295.81	5826594.12	-9.40894	52.58867	504530.84	649531.96
40	472539.83	5826069.39	-9.40530	52.58397	504767.64	649003.73
41	472627.26	5825637.82	-9.40397	52.58009	504849.10	648570.85
42	472019.01	5825619.52	-9.41294	52.57990	504240.47	648560.98
43	471966.09	5825880.79	-9.41375	52.58225	504191.15	648823.05
44	471790.70	5826257.93	-9.41637	52.58563	504020.95	649202.71
45	471624.36	5826440.40	-9.41884	52.58726	503857.11	649387.53
46	470950.20	5826628.87	-9.42881	52.58892	503185.40	649585.39
47	469918.28	5826670.32	-9.44404	52.58923	502153.83	649641.16
48	469187.46	5826670.99	-9.45483	52.58920	501422.85	649651.97
49	469112.37	5826666.81	-9.45594	52.58916	501347.68	649648.82
50	468816.93	5826646.67	-9.46030	52.58896	501051.89	649632.78
51	467918.77	5826603.25	-9.47355	52.58852	500152.92	649601.81
52	468254.46	5826235.81	-9.46856	52.58523	500483.59	649229.63
53	469343.78	5825953.57	-9.45245	52.58276	501569.26	648932.21
54	469418.69	5825833.25	-9.45134	52.58168	501642.51	648810.82
55	469067.93	5825405.47	-9.45647	52.57782	501285.73	648387.81
56	468594.07	5825528.22	-9.46348	52.57889	500813.47	648517.16
57	468770.18	5825142.13	-9.46084	52.57543	500984.26	648128.54
58	468476.10	5824611.17	-9.46513	52.57064	500682.76	647601.53
59	468304.62	5824717.65	-9.46767	52.57159	500512.71	647710.42
60	467781.77	5825863.99	-9.47550	52.58186	500005.64	648864.27
61	467120.96	5826589.53	-9.48532	52.58835	499354.74	649599.15
62	466360.08	5826716.70	-9.49657	52.58944	498595.44	649736.89
63	465809.30	5826576.94	-9.50468	52.58815	498042.59	649604.74
64	464632.97	5826152.91	-9.52200	52.58426	496860.10	649196.92
65	464006.77	5826020.81	-9.53123	52.58304	496231.92	649073.48
66	462062.97	5825610.77	-9.55987	52.57922	494281.96	648690.29
67	460473.69	5825730.75	-9.58333	52.58018	492693.95	648832.34
68	459564.30	5825810.07	-9.59676	52.58083	491785.44	648924.29
69	458597.45	5825936.37	-9.61105	52.58189	490820.11	649064.04
70	458107.76	5826003.53	-9.61828	52.58246	490331.22	649138.01
71	457884.36	5826026.11	-9.62158	52.58264	490108.08	649163.68
72	457102.84	5826105.07	-9.63313	52.58329	489327.45	649253.51
73	456619.24	5826091.09	-9.64026	52.58313	488843.54	649246.23
74	455849.02	5825944.70	-9.65161	52.58175	488071.10	649110.48
75	454422.48	5824933.32	-9.67252	52.57254	486630.17	648118.63
76	454214.12	5824680.38	-9.67556	52.57025	486418.24	647868.51
77	452658.88	5822792.41	-9.69824	52.55314	484836.43	646001.61

78	451853.24	5822031.97	-9.71001	52.54624	484020.04	645252.14
79	450931.74	5821307.90	-9.72349	52.53965	483088.25	644540.66
80	449412.77	5819786.10	-9.74565	52.52583	481547.80	643039.52
81	449161.56	5819534.43	-9.74932	52.52354	481293.04	642791.26
82	443943.29	5815957.73	-9.82562	52.49088	476023.80	639285.90
83	427560.29	5803727.38	-10.06422	52.37901	459466.77	627278.81
84	416745.38	5804129.56	-10.22317	52.38109	448654.05	627830.73
85	407210.11	5799527.98	-10.36195	52.33820	439052.01	623359.52
86	420845.61	5806108.30	-10.16341	52.39948	452782.96	629753.36
87	426878.49	5806010.24	-10.07473	52.39944	458816.35	629571.79
88	434527.87	5816107.33	-9.96430	52.49117	466607.80	639565.97
89	428630.64	5816383.06	-10.05120	52.49291	460712.65	639923.48
90	428381.31	5816397.44	-10.05488	52.49301	460463.44	639941.32
91	428642.91	5816284.55	-10.05100	52.49203	460723.56	639824.77
92	421069.14	5806216.17	-10.16015	52.40049	453008.06	629858.17

1.4 Marine Surveys

The proposed survey programme involves a multi-disciplinary approach that is designed to acquire a full suite of data which includes hydrographical, geophysical, metocean, geotechnical, ecological and (if required) higher energy sound source surveys. The collected data will be used to better understand the existing seabed and sub surface conditions within the Foreshore Licence Application Area. This understanding will then be used to further engage with stakeholders and inform design of Ilen Array Offshore Wind Farm.

Vessels will be either stationary or slow moving (c. 5 knots) when engaged in site investigation activities. The exact equipment to be used will be confirmed following a tender process to procure the site investigation contractor however, Table 1-2 includes a description of the typical equipment, frequencies and intensities of noise levels employed for offshore wind data collection purposes.

The proposed programme of site investigation activities to be undertaken within the application/licenced area is summarised in Table 1-2 below. below. Indicative site investigation locations for the geotechnical SI activities as well as the ecological (benthic grab sampling) and metocean and ecological device deployments is shown in Figure 1 2. For further detail on the proposed programme of site investigations please see the Ilen Array Offshore Wind Farm Foreshore Licence Application: Schedule of Activities document which accompanies the application.

Table 1-2 Summary of proposed survey methodologies

Survey	Methods	Purpose
Hydrographical and Geophysical	Multibeam Echosounder (MBES)	MBES is a system for collecting detailed topographical data of the seabed. Typical equipment includes the Kongsberg EM3002D multi-beam system with mounting system including AML SV Smart Probe,

Survey	Methods	Purpose
		Kongsberg EM 2040 or similar. For these surveys the equipment will operate at a typical central frequency of 200 - 400kHz (700kHz optional) with sound pressure levels in the range of 200-228dB re1µPa @1m.
	Side Scan Sonar (SSS)	SSS surveys are used to determine sediment characteristics and seabed features. The EdgeTech 4200 may be taken as an indicate example of an SSS device and for these surveys will have a potential operating frequency range of approximately 230/540kHz in the offshore area and 540/850kHz in the shallower nearshore area with sound pressure levels of 228dB re1µPa @1m.
	Magnetometer	A magnetometer is used to identify magnetic anomalies and hazard mapping for metal obstructions, shipwrecks and unexploded ordnance on the surface and in the shallow sub-surface. The Geometrics G-882 can be taken as an indicative equipment example, it is a passive device (i.e. it does not emit any sound waves into the marine environment).
	Sub-bottom Profiling (SBP)	SBP is used to develop an image of the subsurface, identifying different strata encountered in the shallow sediments. The Innomar SES-2000 Medium or Medium 100 are indicative examples of parametric system with primary and secondary frequency ranges of 85-115kHz and 2-22kHz, respectively, and sound pressure levels of up to 247 dB (typically operated at <200dB) re1µPa @ 1m, which would be used in both nearshore and offshore areas. The Applied Acoustics AA301 is an indicative example of a boomer, with sound pressure levels in the range of 208-215dB re1µPa @ 1m which would be used in the nearshore shallower area. The applied Acoustics Duraspark 400 is an indicative example of a sparker system used in sub-bottom profiling, with sound pressures in the range of 204-216dB re1µPa @1m.
Geotechnical	Boreholes	Up to 40 no. boreholes will be required for the Preliminary Campaign. Boreholes may be up to 80m deep within the OWF area however within the OECC area they will likely be around 20 m deep. All drilling equipment used will follow the relevant ISO and API technical specifications for drilling equipment.
	Cone Penetration Tests (CPT)	CPTs are a method used for testing the soils strength parameters. CPTs can be performed as either Seabed CPTs or as Down Borehole CPTs. Up to 247 no. CPTs will be required for the Preliminary Campaign. The spacing interval will be determined by the variability and level of understanding of the shallow geology. The final number and location of SI points will be informed by the geophysical survey results.
	Vibrocore / Gravity Corer	Vibrocore (VC) and Gravity Corer (GC) are two methods of collecting un-consolidated seabed samples. Up to 273 no. sample locations for either vibrocore or gravity sampling with a target depth of 6m BSF will be required for the Preliminary Campaign.
Metocean	Floating LiDAR	Up to 2 floating LiDAR buoys will be deployed to measure the wind resource within the OWF Area. Deployment of this buoy will include

Survey	Methods	Purpose
		anchor points on the seafloor. LiDAR may be deployed for a period of between 12 to 24 months.
	Acoustic Doppler Current Profiler (ADCP)	Up to 5 ADCPs may be used to examine wave and current conditions in the Foreshore Licence Application Area. This equipment is installed on the seabed and anchored with a suitable mooring structure. It is generally a short-term deployment used to gather seasonal data (e.g. winter storm data) however may be deployed for longer.
	Wave Buoy	Up to 2 wave rider buoys may be deployed to measure wave heights and direction to feed into the detailed design of the project within the OWF area. They will be moored to the seabed by a suitably sized mooring structure.
Ecology	Bird Survey	Identify bird species distribution and behaviour within the Foreshore Licence Application Area using non-intrusive aerial surveys. This does not require a licence under the Foreshore Act 1933, as amended and is included for information only.
	Fisheries Survey	Identify fish species distribution within the Foreshore Licence Application Area. Exact details of monitoring required will be determined through engagement with the relevant authorities such as SFPA, the Marine Institute and through local knowledge where appropriate.
	Benthic Ecology (subtidal benthic survey, intertidal habitat walkover survey)	This survey is designed to identify the expected benthic communities and habitats within the Foreshore Licence Application Area. This may consist of an intertidal walkover survey with a biotope mapping exercise of the intertidal part of the OECC and its proposed landfalls with identification of the existing habitats. Where appropriate, core/quadrat sampling and hard substrate quadrat sampling will be carried out. In the intertidal area features of conservation importance such as reefs will be identified by means of visual inspection and mapped. Where the Annex I Habitat reef is a qualifying interest for an SAC, MNCR Phase II surveys will be used to survey pre-selected sites within the SAC. MNCR Phase I surveys will be used for all other intertidal reef. Subtidal sample locations may be subject to drop down video in advance of sampling. In the subtidal area features of conservation importance such as reefs will be identified by means of visual inspection. There will be up to 273 no. subtidal locations within the Foreshore Licence Application Area and typically up to 4 samples will be taken at each location.
	Marine Mammal Survey	Identify marine mammal species distribution within the Foreshore Licence Application Area. This does not require a licence under the Foreshore Act 1933, as amended and is included for information only. The marine mammal observational studies will be run concurrently with the at site bird surveys.

Survey	Methods	Purpose
	Marine Mammal Acoustic Monitoring	Marine mammal acoustic monitoring using CPODs deployed on the seabed. SoundTrap hydrophones may be deployed alongside the CPODs for periods throughout the monitoring campaign. Either 2 permanent sites will be selected, or the 2 sites will be relocated every 3 months during battery change. The CPOD locations are subject to archaeological survey results.
Archaeology	Underwater Archaeology	Identification and assessment of metallic and other targets recorded during the marine geophysical surveys.

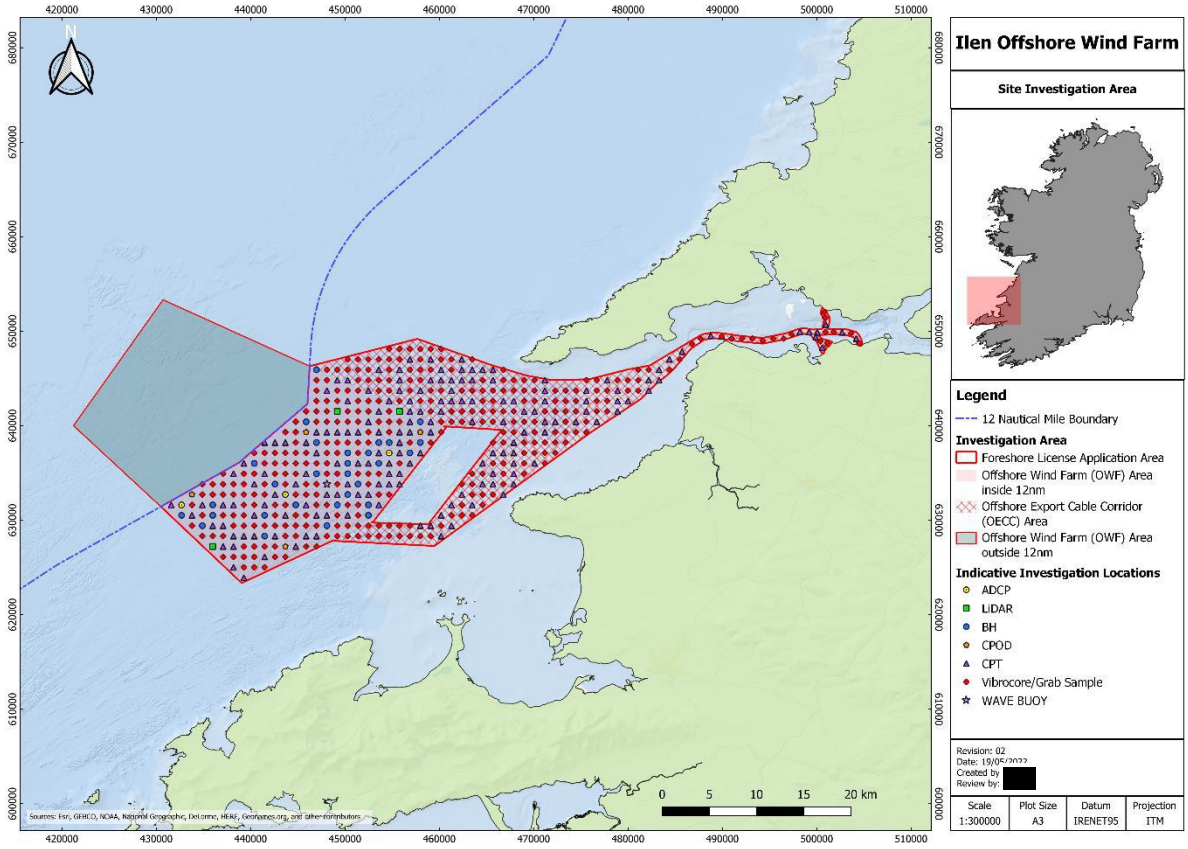

Figure 1-2: Indicative Site Investigation Locations

1.5 Survey Schedule

The intention is to begin site investigation activities as soon as feasible following award of the Foreshore Licence, with a staged programme of investigations over the next number of years, capitalising on suitable weather windows over this time period. This phased approach will progress the overall development towards detailed design stage. Procurement of survey contractors will be undertaken to ensure that suitable weather windows can be utilised as soon as possible following licence award. The exact survey mobilisation dates will be known at that point in the process.

2 Habitats Directive (92/43/EEC)

The purpose of this report is to inform the Appropriate Assessment process as required under the Habitats Directive (92/43/EEC). The Appropriate Assessment Screening contained in Section 5 of this report will determine whether the proposed surveys, both alone and in combination with other planned activities under the remit of this project and others, are likely to have a significant effect on any Natura 2000 or its qualifying interests. This document includes Stage 1 of the Appropriate Assessment process. For Stage 2 Natura Impact Statement see accompanying Ilen Array Offshore Wind Farm NIS.

This report has been prepared in accordance with the following guidance:

1 Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010 revision)
2 Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10
3 Guidance to Manage the Risk to Marine Mammals from Manmade Sound Sources in Irish Waters. Prepared by National Parks and Wildlife Service, DAHG (2014).
4 Guidelines for Good Practice: Appropriate Assessment of Plans under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011);
5 Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document. Prepared by National Parks and Wildlife Service, DAHG (2012).
6 Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission - 21 November 2018)
7 Office of the Planning Regulator – Practice Note 01 – PN01 (March 2021)

2.1 Legislative Background

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) adopted in 1992, transposed into Irish Law in 1997 and as subsequently amended and consolidated aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It provides a framework for the legal protection to ensure the conservation of a wide range of rare, threatened, or endemic animal and plant species throughout the European Union. The Birds Directive (Conservation of Wild Birds Directive (79/409/EEC) aims to protect all of the 500 wild bird species naturally occurring in the European Union. The Habitats Directive, along with the Birds Directive forms the cornerstone of Europe's nature conservation policy. Together they form a coherent network of protected areas (Special Areas of Conservation and Special Protection Areas), called Natura 2000, safeguarded against potentially damaging developments.

The requirement for "Appropriate Assessment" is set out in Articles 6(3) and 6(4) of the Habitats Directive (92/43/EEC). If a project is likely to have a significant effect on a Natura 2000 site, either

alone or in combination with other plans or projects, it must undergo an appropriate assessment (AA). According to Article 6(3) of the Habitats Directive:

"Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 site) but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives".

In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate, after having obtained the opinion of the general public.

Article 6(4) states: "If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

2.2 The Appropriate Assessment Process

The European Commission's methodological guidance (EC, 2002) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The four stages are summarised diagrammatically below, and the steps and procedures involved in completing each stage follows. Stages 1-2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

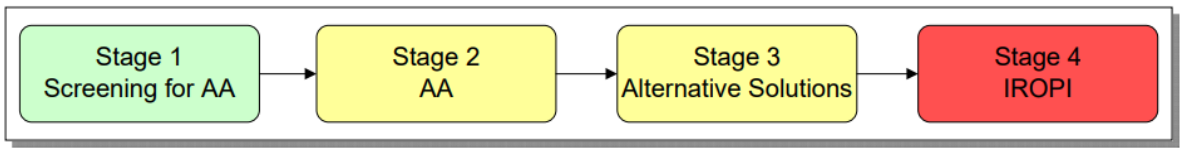

Figure 2-1: Stages in the AA process (Source: DEHLG, 2009)

Stage 1. Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

i. whether a plan or project is directly connected to or necessary for the management of the site, and
ii. whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

Stage 2. Appropriate Assessment

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement, i.e. the report of a targeted professional scientific examination of the plan or project and the relevant Natura 2000 sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, taking account of in combination effects. This should provide information to enable the competent authority to carry out the appropriate assessment. 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 4, or the plan or project should be abandoned. The AA is carried out by the competent authority and is supported by the NIS.

Stage 3. Alternative Solutions

This stage examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a Natura 2000 site. The process must return to Stage 2 as alternatives will require appropriate assessment in order to proceed. Demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, is necessary to progress to Stage 4. Stage 4. Imperative Reasons of Overriding Public Interest (IROPI)/Derogation Stage 4 is the main derogation process of Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a Natura 2000 site to proceed in cases where it has been established that no less damaging alternative solution exists.

Stage 4. Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

Stage 4 is the main derogation process of Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a Natura 2000 site to proceed in cases where it has been established that no less damaging alternative solution exists. The extra protection measures for Annex I priority

habitats come into effect when making the IROPI case18. Compensatory measures must be proposed and assessed. The Commission must be informed of the compensatory measures. Compensatory measures must be practical, implementable, likely to succeed, proportionate and enforceable, and they must be approved by the Minister for Housing, Local Government and Heritage.

3 Potential Environmental Impacts

The following are the potential environmental impacts that have been identified for appraisal given the nature of the site investigation activities proposed under this application:

- Physical disturbance to marine benthic communities
- Disturbance from vibration and underwater noise associated with surveys
- Injury due to collision (survey vessels/sampling equipment)
- Visual and noise disturbance to bird species
- Pollution event

These potential effects are discussed in the following sections

3.1 Physical Disturbance to Marine Benthic Communities

Most site investigation activities are located outside of any Natura 2000 site therefore there will be no direct impact to most of the designated Annex I habitat within Natura 2000 sites. However, the Proposed OECC Area partially overlaps one SAC and one SPA:

- River Shannon and River Fergus Estuaries SPA
- Lower River Shannon SAC

The FLA Area is also adjacent to the Kerry Head Shoal SAC.

Sensitive habitats within these Natura sites may be directly affected by some of the site investigation activities (geotechnical including boreholes, CPTs, vibrocores, and the benthic surveying including grab sampling and the intertidal sampling). The deployment of metocean devices is not likely to affect the three sites as the devices will not be deployed within the Proposed OECC Area.

Very small areas of the seabed will be disturbed and sampled during the environmental and geotechnical site investigation activities. The benthic survey will involve a number of different survey types as follows:

<u>Nearshore area</u>

- Intertidal survey: from HWM to the charted low water mark (LWM) of each shore landing.
- Shallow water survey: from LWM seawards to the first 10m lowest astronomical tide (LAT) water depth.

<u>Offshore area</u>

- Offshore survey: Seawards of the first 10 m LAT water depth to 12 nm boundary

Within the nearshore area an intertidal survey (walkover survey) will be carried out at the landfall for the wind farm export cable once the locations suitable for the cable landing have been identified. A

series of locations will also be sampled in areas of both soft sediment and hard substrates to allow a detailed biotope mapping at these landing locations. The area surveyed could be up to 500 m wide.

The intertidal surveys will be undertaken during spring tides in line with guidance in the Marine Monitoring Handbook (Davies *et al.*, 2001). During the walkover survey, biotopes will be identified according to the European Nature Information System (EUNIS) classification. Where possible, boundaries of biotopes will be tracked using a handheld GPS device and recorded using a suitable software package. Various locations will be sampled by quadrat with dimensions of 0.04 m^2 (0.2 m x 0.2 m), to identify the Benthic macrofauna at the landfall location. Surveying will take place in day light hours and the position of sensitive species within the survey area will be noted and avoided.

Within the offshore area the benthic survey will include the extraction of sediment material directly from the seabed using a grab sampler. As grab sampling by its nature can only be carried out in soft sediments (muds, sands, gravels) once the sampling device is retrieved any disturbance to the sediment will recover naturally. A drop-down camera or ROV will be used in advance of undertaking grab sampling to ensure that protected habitats within SACs are not disturbed. Where the presence of sensitive habitats is detected, surveying will be by video or high resolutions stills images only.

Very small areas of the seabed will be disturbed and sampled during the environmental and geotechnical surveys. The benthic survey will involve the extraction of sediment material directly from the seabed using a grab sampler. As grab sampling by its nature can only be carried out in soft sediments (muds, sands, gravels) once the sampling device is retrieved, any disturbance to the sediment will recover naturally.

Borehole locations will involve the penetration of a drill pipe to a scheduled depth of between 20m and 80m below the seafloor. Most of the boreholes within the OECC Area will be circa 20m deep. Boreholes within the development area may be up to 80m deep. This will cause disturbance to the area of the drill pipe penetration itself and the area directly surrounding this by the mound created by drill risings. An estimated 1-2m^2 area of the seafloor will be affected by the footprint of the mound created by drill cuttings. Immediately following the removal of the cores, the void in the seabed will fill naturally leaving only a minor impression on the seafloor.

Cone Penetration Testing (CPT) does not involve the removal of any material and the hole created by the penetration of the cone (approx. 5cm diameter), will infill upon extraction of the rods. The CPT unit has a footprint of approximately 8m^2 which will sit on the sea floor for the duration of the test which typically takes 2-3 hours.

Physical disturbance to marine benthic communities may result in:

- Habitat disturbance and smothering during all intrusive site investigation activities
- Increased suspension of solids in water column
- Vibration from geo-technical equipment
- Sediment penetration and some substratum loss

Benthic communities in the footprint of sampling equipment will be impacted through minor disturbance around the drill site and a small volume of substratum loss, direct displacement or smothering during sampling. Any smothering will be a thin layer due to small volumes of sediment displaced during the sampling. Softer sediments (such as sand and mud) are highly recoverable to disturbance and typical species can quickly recolonise the area.

The geotechnical sampling methods proposed are likely to cause a small amount of sediment to become suspended. The resulting sediment suspension will be dispersed and deposited on the sea floor at a location subject to wave action and tidal stream. As a result, the deposition levels of this material will be very insignificant, within storm background levels of sediment migration in the Foreshore Licence Application Area.

A very small area of the intertidal substrate within the Lower River Shannon SAC will be disturbed in the immediate vicinity of geotechnical survey and benthic sampling.

As the site investigation activities will not cause any physical obstructions, there is no potential for likely significant effects to alter the natural circulation of sediment and organic matter, or to cause changes to the existing sediment transport processes of any Natura 2000 site.

3.2 Disturbance from vibration and underwater noise associated with surveys

3.2.1 Cetaceans and pinnipeds

Both cetaceans and pinnipeds have evolved to use sound as an important aid in navigation, communication, and hunting (Richardson *et al*., 1995). It is widely accepted that the main environmental concern relating to marine mammals is the potential effects of anthropogenic underwater noise (see Nowacek *et al*., 2007 for review). Exposure to noise can induce a range of effects on marine mammals: physical effects may include a temporary reduction in hearing sensitivity (Temporary Threshold Shift-TTS) which is reversible over time; or following intense noise exposure, Permanent Threshold Shift-(PTS). Other impacts include masking of biologically important noises by anthropogenic noise (perceptual impacts); behavioural changes such as displacement from feeding, resting, or breeding grounds; and stress (Southall *et al*., 2007, Southall *et al*., 2019).

Acoustic instruments and equipment used in targeted marine geophysical investigations produce sound at frequencies within the hearing range of marine mammals (Nowacek *et al*., 2007). In order to evaluate the potential of the site investigation activities equipment to cause harm to marine mammals, an assessment has been conducted using the approach described in Southall *et al.* (2007). Marine mammals are separated into five groups based on their functional hearing, namely low-frequency cetaceans, mid-frequency cetaceans, high-frequency cetaceans, pinnipeds in water and pinnipeds in air. For each of these groups sound pressure levels that would result in injury (PTS or TTS) were proposed for individuals exposed to single, multiple and non-pulsed sources (Table 3-1). For the purposes of this assessment pinnipeds in air are not included.

Table 3-1 Sound Pressure Level (SPL) injury criteria proposed by Southall *et al*. (2007), for individual marine mammals exposed to discrete noise events

Marine Mammal group	Injury Criteria	
	TTS	PTS
Low-Frequency Cetaceans (Baleen whales)	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
Mid-Frequency Cetaceans (including bottlenose dolphins)	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
High Frequency Cetaceans (including harbour porpoise)	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
Pinnipeds (in water)	212dB re: 1µPa (peak)	218 dB re: 1µPa (peak)

The DAHG (2014) report 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' addresses several key potential sources of anthropogenic sound that may impact detrimentally upon marine mammals in Irish waters. It incorporates a re-examination of the Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters (2007) and thereby provides replacement guidance and protective measures in this respect. The DAHG 2014 Guidance includes plan/project-specific guidance on Drilling Activities in Section 3.2.2 and Geophysical Acoustic Surveys in section 3.2.4 and will be followed throughout the site investigation activities.

The following auditory band widths for marine mammals which may be present in the vicinity of the Foreshore Licence Application Area are from Southall *et al*. (2007) cited in DAHG (2014) and are shown in Table 3-2.

Table 3-2 Marine mammal auditory bandwidths

Frequency	Marine Mammal/Species	Estimated Auditory Band Width (kHz)
Low Frequency Cetaceans	Baleen whales (minke, fin and humpback whale)	0.007 - 22
Mid Frequency Cetaceans	Most toothed whales and dolphins (bottlenose, common and Risso's dolphin, killer and pilot whales)	0.15 - 160
High Frequency Cetaceans	Certain toothed whales and porpoises (harbour porpoise)	0.2 - 180
Low Frequency Pinnipeds in water	Seals (grey seal and common seal)	0.075 - 75

Noise characteristics of the various surveys are detailed in Table 3-3 below.

Table 3-3 Marine survey noise sources

Noise Source	Frequency (kHz)	Sound Pressure Level (dB re 1µPa @ 1m)
Shipping Noise	0.05 – 0.3	160-175
Multibeam echosounder (MBES)	200-700	200-228
Side scan sonar (SSS)	230/540 or 540/850	228
Sub-bottom profiler (SBP)	85 - 115 / 2 - 22	247
Boomer system (SBP)	2.5	208 - 215
Sparker (SBP)	2 – 16	204 - 216
Geotechnical drilling (Rotary)	0.002 - 50	160

Comparing the data on Marine mammal auditory band width (see Table 3-2) and the noise characteristics of the surveys (see Table 3-3) it is deemed that the following will be audible to marine mammals:

- Shipping noise
- Sub-bottom Profiler (SBP)
- Side Scan Sonar (SSS) (unlikely to use a frequency audible to cetaceans, i.e. below 200kHz, but could potentially depending on site conditions and survey design)
- Drilling

The Magnetometer (MM) is a passive device measuring magnetic fields and does not emit sound, Cone Penetration Testing (CPT) and Vibrocore are undertaken with mechanical devices which do not emit significant noise. Multibeam and side scan sonar surveys are typically at such high frequency and low power that they are deemed outside the audible threshold of marine mammals.

The relevant surveys which are within the audible band width for marine mammals are presented in Table 3-4.

Table 3-4 Marine Mammal Auditory Band Width and relevant surveys, marine mammals known in the area are also listed.

Frequency	Marine mammal/Species	Estimated Auditory Bandwidth (kHz)	Audible activity
Low Frequency Cetaceans	Baleen whales (minke, fin and humpback whale)	0.007 - 22	Shipping, SBP, SSS, Drilling
Mid Frequency Cetaceans	Most toothed whales and dolphins (bottlenose, common and Risso's dolphin, killer and pilot whales)	0.15 - 160	Shipping, SBP, SSS, Drilling
High Frequency Cetaceans	Certain toothed whales and porpoises (harbour porpoise)	0.2 - 180	Shipping, SBP,SSS, Drilling
Low Frequency Pinnipeds in water	Seals (grey seal and common seal)	0.075 – 75	Shipping, SBP, SSS, Drilling

3.2.2 Fish species

Only fish species that use sound pressure to hear may be impacted by the site investigation activities.

All fish species studied to date have been found to use either particle motion or sound pressure for detecting sound; these studies suggest that all fish have similar particle motion hearing and that it is the presence of ancillary hearing structures that differentiates their hearing sensitivity. While all fish detect and use particle motion, only a subset can detect sound pressure (Putland *et al*, 2018).

In general, fish species without a swim bladder (sharks, flatfish and some tunas), or those that have small or reduced swim bladders (such as many benthic species, including some flatfish), tend to have relatively poor auditory sensitivity and generally cannot hear sounds at frequencies above 1 kHz. These are also known as hearing generalists and their hearing only involves particle motion, not sound pressure (NOAA, 2016). Lamprey are a primitive eel-like fish and do not have a swim bladder. They are not sensitive to sound pressure.

Fish species with anatomical specializations between the swim bladder and the ear generally have lower thresholds and wider hearing bandwidths than species without such specializations and may have greater ability to detect, and therefore respond to sound pressure. This is the case of fish belonging to clupeiform species (e.g., shad, herring, sardines, and alewives). Clupeids of the shad family (Alosinae) in particular, have shown sensitivity to a range of frequencies that can extend to >100 kHz. (Mann *et al*., 2001). Teague & Clough (2011) recorded positive significant reactions in juvenile twaite shad to sound frequencies of between 30 and 60 kHz with a peak at 45kHz. Behavioural studies of the responses of American shad to ultrasound (Mann *et al.*, 2001; Popper *et al*., 2004) demonstrate that they show a graded series of responses depending on the sound level and, to a lesser degree, on the frequency of the stimulus. Low-intensity stimuli elicit a non-directional movement of the fish, whereas somewhat higher sound levels elicit a directional movement away from the sound source and still higher-level sounds produce a ‘‘wild’’ chaotic movement of the fish.

The authors speculate that the response of the American shad (and, presumably, other clupeids that can detect ultrasound) to ultrasound evolved to help these species detect and avoid a major predator, i.e., echolocating cetaceans. As dolphins echolocate, the fish are able to hear the sound at over 100 m; if the dolphins detect the fish and come closer, the nature of the behavioural response of the fish changes in order to exploit different avoidance strategies and lower the chance of being eaten by the predators (Popper *et al.*, 2004). Therefore, based on the operating frequencies of the site investigation activities (refer Table 3-3) twaite shad may be impacted by some of the geophysical site investigation activities and shipping noise. Given that twaite, allis and the American shad are in the same genus (Alosa) and are morphometrically identical to a large extent, it is reasonable to infer that allis shad are similarly sensitive to underwater noise.

There are many other fish that possess swim bladders, but with no special adaptations, which often do not have a high degree of hearing sensitivity compared to those described above. For example, Atlantic Salmon (*Salmo salar*) have poor hearing sensitivity and are only capable of detecting low frequency tones (below 380 Hz) and particle motion rather than sound pressure (NOAA, 2016).

Shipping noise may be audible to salmon however they are not sensitive to sound pressure levels therefore would not be affected by the geophysical survey activities.

Several studies cited in Popper & Hawkins (2019) showed that even exposure to very high intensity low and mid-frequency sonars resulted in no mortality in fish, nor did exposure to seismic airguns, and that only fish receiving high intensity and particularly impulsive sounds experienced damage to body tissues, known as barotrauma. This is not the case for any of the equipment to be used in the geophysical surveys proposed, so it is highly unlikely that death or barotrauma would occur to any fish species as a result of the site investigation activities.

Temporary threshold shift (TTS) is a non-injurious temporary reduction in hearing sensitivity caused by exposure to intense sound, and it has been documented in some fish only after multiple exposures to intense sounds (e.g., 190 dB re 1 µPa rms) or as a result of long-term exposure (e.g., tens of minutes or hours) to somewhat less intense sounds (Popper & Hawkins, 2019). Furthermore, several studies cited in Popper & Hawkins (2019) have shown that sensory hair cells are constantly added in fish and replaced when damaged, and that both hearing specialists and generalists were able to recover from varying levels of substantial TTS in less than 18 hours after exposure. Permanent hearing loss has not been documented in fish (NOAA, 2016).

A study (Mickle *et al*., 2009) carried out on auditory responses in the sea lamprey showed the species detected tones of 50–300 Hz with equal sensitivity but did not detect sounds above 300Hz, therefore shipping noise is likely audible to lamprey species however as previously stated they have no swim bladder and therefore are not sensitive to sound pressure. As sea lamprey are not sensitive to sound pressure, they would not be affected by the site investigation activities.

Salmon may also be able to hear the underwater noise associated with shipping and SBP/HESS however again while they have a swim bladder it does not include the special adaptation necessary to experience sound pressure. Therefore, while salmon may be able to hear sound it would not be affected by the type of noise produced during shipping activities or geophysical surveys. Therefore, these three species will not be affected by the survey activities.

In addition, none of the known prey species of birds or marine mammals that forage in the area are sensitive to sound pressure therefore there is no impact pathway identified between the prey species of Special Conservation Interests of any of the SPAs or the Qualifying Interests or any of the SACs considered relevant to the Foreshore Licence Application Area and the proposed site investigation activities under the Foreshore Licence Application.

3.2.3 Birds

There is very limited information on the underwater hearing abilities of diving birds. The evidence of the impacts of underwater noise generated by human activities is also very limited. Available information regarding studies on the potential effects of underwater noise from marine surveys focus mainly on seismic surveys for oil and gas related activities where airguns were used. The proposed site investigation activities will generate significantly less underwater noise than those airgun sources.

However, a short summary of existing information on the potential effects of underwater noise on birds is presented here.

A range of diving species has been tested to establish an underwater hearing range. The results show that this underwater hearing range is approximately 500Hz to 4kHz, with similar results obtained in air and underwater (Crowell 2014, Crowell *et al*. 2015, Hansen *et al*. 2017). McCauley (1994) inferred from vocalisation ranges that the threshold of perception for low frequency seismic noise in some species (e.g. penguins, considered as a possible proxy for auk species) would be high, hence individuals might be adversely affected only in close proximity to the source.

Very high amplitude low frequency underwater noise may result in acute trauma to diving seabirds, with several studies reporting mortality of diving birds in close proximity (i.e. tens of metres) to underwater explosions (Yelverton *et al*. 1973, Cooper 1982, Stemp 1985, Danil & St Leger 2011). Explosions which are percussive in nature would be many magnitudes greater than any of the activities proposed under this application. Mortality of seabirds has not been reported during extensive seismic operations in the North Sea and elsewhere.

With the exception of Pichegru *et al*. (2017), which relates to penguins, there are no published reports of changes in abundance or distribution of diving birds concurrent with seismic or other acoustic survey activity. A study investigated seabird abundance in the Hudson Strait (Atlantic seaboard of Canada) during seismic surveys over three years (Stemp 1985). Comparing periods of shooting and non-shooting, no significant difference was observed in abundance of thick-billed murre (Brünnich's guillemot), or fulmar or kittiwake.

While seabird responses to approaching vessels are highly variable (e.g. Fleissbach *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, any behavioural disturbance of seabirds due to the 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 as opposed to injury due to underwater noise.

According to the information provided in Department for Business, Energy & Industrial Strategy 2019 report for Oil and Gas (2019) (BEIS, 2019) direct effects from underwater seismic 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. There is however, very little evidence for such effects and, should they occur, they would be expected to be short-term and temporary.

Considering the evidence (albeit limited) of low hearing sensitivity and a lack of reported injury or disturbance effects to diving birds, combined with the likely avoidance of the physical presence of survey vessel(s), the risk of significant mortality, injury or disturbance to diving birds from 3D seismic survey is considered to be very low. Therefore, the proposed survey activities are very unlikely to have

significant negative effects as they are much less intensive in underwater noise propagation in comparison to typical 3D seismic surveys, where impulsive noise (3D seismic survey, rig site survey, VSP, conductor piling) is generated causing underwater noise change and vibration.

A list of bird species potentially vulnerable to underwater noise effects is provided in Table 3-5 with species which are known to engage in pursuit diving or benthic feeding in marine, coastal and estuarine waters at least during part of the year.

Table 3-5: Migratory and/or Annex I diving bird species considered potentially vulnerable to underwater noise

Migratory and/or Annex I diving bird species considered potentially vulnerable to underwater noise effects		
Divers and grebes	**Seabirds**	**Diving ducks**
Great northern diver *Gavia immer*	Manx shearwater *Puffinus puffinus*	Pochard *Aythya ferina*
Red-throated diver *Gavia stellata*	Gannet *Morus bassanus*	Tufted duck *Aythya fuligula*
Black-throated diver *Gavia arctica*	Cormorant *Phalacrocorax carbo carbo*	Scaup *Aythya marila*
Little grebe *Tachybaptus ruficollis*	Shag *Phalacrocorax aristotelis*	Eider *Somateria mollissima*
Great crested grebe *Podiceps cristatus*	Guillemot *Uria aalge*	Long-tailed duck *Clangula hyemalis*
Slavonian grebe *Podiceps auritus*	Razorbill *Alca torda*	Common scoter *Melanitta nigra*
	Puffin *Fratercula arctica*	Velvet scoter *Melanitta fusca*
		Goldeneye *Bucephala clangula*
		Red-breasted merganser *Mergus serrator*
		Goosander *Mergus merganser*

3.3 Injury due to collision (survey vessels/sampling equipment)

There is a risk of collision between marine mammals and survey vessels. However, it is largely recognised that the key factors contributing to collision between marine mammals and vessels are the presence of both in the same area and vessel speed (see Schoeman *et al*., 2020 for review). Injuries to marine mammals from vessel strikes are species-dependent but generally are more severe at higher impact speeds (Wang *et al*., 2007). Vessels involved in these surveys are likely to be either stationary or travelling slowly (i.e. 5 knots or lower), thus allowing both the vessel and any animal in the area time to avoid collision.

Cetacean and pinnipeds in the area are exposed to vessels of all sizes on a regular basis as the site investigation area is in a busy shipping area. As a result, they are likely to maintain a distance from all survey vessels for the short time period of site investigation activities before returning to the area once site investigation activities has finished. Therefore, the collision risk posed by the site investigation activities is likely to be significantly lower than that posed by commercial shipping activity. A survey vessel in the area will not pose a collision risk to seabirds foraging the area.

3.4 Visual and noise disturbance to bird species

3.4.1 Visual and noise disturbance to birds within the Foreshore Licence Application Area during site investigation activities

The physical presence of the survey vessel may potentially cause displacement and/or other behavioural responses in birds. Most species from SPAs within foraging range of the Foreshore Licence Application 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 2008, Fleissbach *et al*. 2019). While rafting birds which are Qualifying Interests of SPAs within foraging range of the Foreshore Licence Application Area may move in response to vessels in transit, such effects are of low magnitude and short duration, and will represent negligible additional disturbance over other vessel movements, including existing fishing, cargo and tanker traffic. The physical presence of the survey vessels may result in temporary disturbance to individual birds present in the immediate vicinity of the Foreshore Licence Application Area. There is also the potential for disturbance due to human activity. Such disturbance may result in birds being temporarily displaced from their chosen feeding/resting location; however, they will be able to move to alternative foraging locations nearby.

The following seabird species were identified as relevant considering the location of their breeding colonies and foraging distances of these species:

- Manx shearwater *Puffinus puffinus*
- Gannet *Morus bassanus*
- Guillemot *Uria aalge*
- Razorbill *Alca torda*
- Puffin *Fratercula arctica*
- Black-legged kittiwake *Rissa tridactyla*
- Northern fulmar *Fulmarus glacialis*
- Lesser black-backed gull *Larus fuscus*
- Herring gull *Larus argentatus*
- Storm petrel *Hydrobates pelagicus*

As there is existing shipping activity in the region, birds are already accustomed to physical disturbance from marine traffic, therefore the introduction of a small number (1-2) of slow-moving additional vessels is not likely to cause significant disturbance.

3.4.2 Visual and noise disturbance to seabirds during the breeding season within SPAs

Birds may be disturbed by human-based activities during the breeding season while nesting. Disturbance causing birds to temporarily take flight may leave chicks vulnerable to predation by predators, thereby affecting the successful fledging of chicks and reducing the reproduction rate. However, as the closest SPA for breeding seabirds is located 10.74 km away (Saltee Island SPA) disturbance to nesting birds during the breeding season within SPAs is not considered as an impact pathway.

3.5 Pollution Event

The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78, MARPOL is short for maritime pollution and 73/78 short for the years 1973 and 1978) is one of the most important international marine environmental conventions. It aims to prevent both operational and accidental discharge into the marine from sea going vessels. Ireland ratified the various elements of the MARPOL Convention through the Sea Pollution Act 1991, the Sea Pollution (Amendment) Act 1999 and the Sea Pollution (Miscellaneous Provisions) Act 2006. It was given further legal effect through several Statutory Instruments under these Acts. The Acts place a legal obligation upon operators of vessels to implement measures to prevent both operational and accidental discharges from ships of substances, which may damage the marine environment as well as human health.

While the site investigation activities will result in a temporary increase in vessels using the area which would therefore theoretically increase the risk of accidents and resultant fuel or oil spills, an incidence of pollution whether from an accidental occurrence or operational activities is not considered likely in light of the legal obligations to comply with MARPOL outlined above.

All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design. Therefore, it is considered not likely that there would be any occurrence of a pollution event either accidental or otherwise that could directly or indirectly affect any SAC or SPA. As such, pollution events are not considered further as a potential impact in this report.

3.5.1 Oil Pollution - Diving Birds

All seabirds and in particular diving birds are considered vulnerable to oil pollution given the time they spend resting on the water surface, and diving through it in search of food. However, the significant adverse effects of potential oil pollution on sensitive areas including SACs, SPAs, their QAs and the marine environment related to site investigation activities for offshore wind farms is considered minimal and not to be over and above existing background risk. This is due to extremely rigorous health, safety and environmental conditions dictated by the legislation described above (Section 3.5)

with particular focus on assurance for all possible preventive measures to be in place to avoid any oil pollution event of any scale.

Therefore, it is considered not likely that there would be any occurrence of a pollution event either accidental or otherwise that could directly or indirectly affect diving birds or their environment. As such, pollution events are not considered further as a potential impact on diving birds in this report.

4 Special Areas of Conservation, Special Protection Areas and Qualifying Interests

The source of potential impacts of the proposed geophysical site investigations is discussed in Chapter 3 of this report. In this section, those European Sites (i.e. Special Areas of Conservation and Special Protection Areas) and their Qualifying Interests (Annex II Species) or Special Conservation Interests (Birds) which have the potential to be affected are outlined. The zone of influence relevant to the potential impacts of the activities taking into account the receiving environment is also outlined.

4.1 Zone of Influence of the Site Investigation Activities

In determining the zone of influence of the proposed activities (i.e. SPAs, SACs, QIs and SCIs relevant to this report) the Source-Pathway-Receptor model was used as outlined in the recent guidance issued by the Office of the Planning Regulator, OPR Practice Note 01: PN01. Potential impacts of the site investigation activities are described in detail previously in Chapter 3 of this report and criteria for inclusion in the Appropriate Assessment Screening is discussed in Chapter 5 of this report.

As the proposed site investigation activities are entirely marine based, with all survey activity located in the marine environment, there is therefore no possible direct interaction and no pressure pathway on terrestrial or freshwater SAC's that have no coastal habitat and no mobile species with a marine element (e.g., mobile marine or partially marine species). Therefore, such sites have been considered to be outside any zone of influence of the proposed activities.

Based on the potential impacts which are listed in Chapter 3, the following SACs and SPAs are considered relevant to this report:

- Any Natura 2000 site within or adjacent to the Foreshore Licence Application Area which may be affected by the proposed activities given the nature of the activities using the source-pathway-receptor model.

- Any Natura 2000 site within the likely zone of influence of the Foreshore Licence Application Area, following Source-Pathway-Receptor model. Considering the very temporary and localised nature of the effects of the proposed activities (Refer: Chapters 3 and 5 of this report), a conservative zone of influence is adopted with respect to Special Protection Areas and their Special Conservation Interest Wetlands and Waterbirds [999], with all those sites in the vicinity of the Foreshore Licence Application Area considered. In addition, Natura 2000 sites with breeding seabirds listed as species of Qualifying Interest have been considered where their mean maximum breeding season foraging range indicates that they should be included in the screening process.

- Any Special Area of Conservation that is designated for mobile Annex II species that have the potential to occur within the Foreshore Licence Application Area and be affected by the site investigation activities. Foraging distances and/or management units (Celtic and Irish Seas)

have been used to determine relevant sites depending on the Qualifying Interests. This may be in the region of 200 km for grey seals, 20 km for common seals, 12 km alongshore for otter, or the limits of the management unit for harbour porpoise and bottlenose dolphin. In the absence of information on the distances covered by migrating salmon, twaite shad and allis shad, a precautionary 200 km is applied.

4.2 Identification of Relevant Special Areas of Conservation and Special Protection Areas

4.2.1 Special Areas of Conservation and Qualifying Interests: Annex I Habitats

Consideration of likely significant effects based on the Source-Pathway-Receptor (SPR) for the site selection subject to a screening exercise was taken as a principle, where the ecological pathway or functional link between the proposed development and the European site and potential impact is taken into consideration (OPR, 2021).

There will be no barrier to any SAC established and no changes to tidal flows that could affect any SAC. In addition, the effect of the site investigation activities will be localised, temporary in nature and will have an imperceptible effect within the vicinity of each site investigation location. Any sediment disturbed as a result of geotechnical surveys is expected to be dispersed by the prevailing tides and will be far less than any typical storm event.

The area is subject to strong sea currents and therefore any areas of soft sediment are highly dynamic often changing with the tide. There will be no interaction with Annex I Habitats as a result of the geophysical survey. Furthermore, any incidence of pollution whether accidental or otherwise is considered unlikely as all vessels will as required by law be compliant with the MARPOL Convention and the relevant National legislation implementing that Convention.

There is one designated Special Areas of Conservation (SAC) within the Proposed Cable Route Area:

- Lower River Shannon SAC

There are a further seven SACs located in the vicinity of the Project Foreshore Licence Application Area, all of which have a marine element. These eight SACs listed below (Figure 4-1; Table 4-1), are designated for the presence of Annex I habitats listed on the EU Habitats Directive. The descriptions are taken directly from the NPWS site synopses at www.npws.ie with more up to date information included where available:

- Kerry Head Shoal SAC
- Magharee Islands SAC
- Tralee Bay and Magharees Peninsula, West to Cloghane SAC
- Kilkee Reefs SAC
- Mount Brandon SAC

- Akeragh, Banna and Barrow Harbour SAC
- Carrowmore Dunes SAC

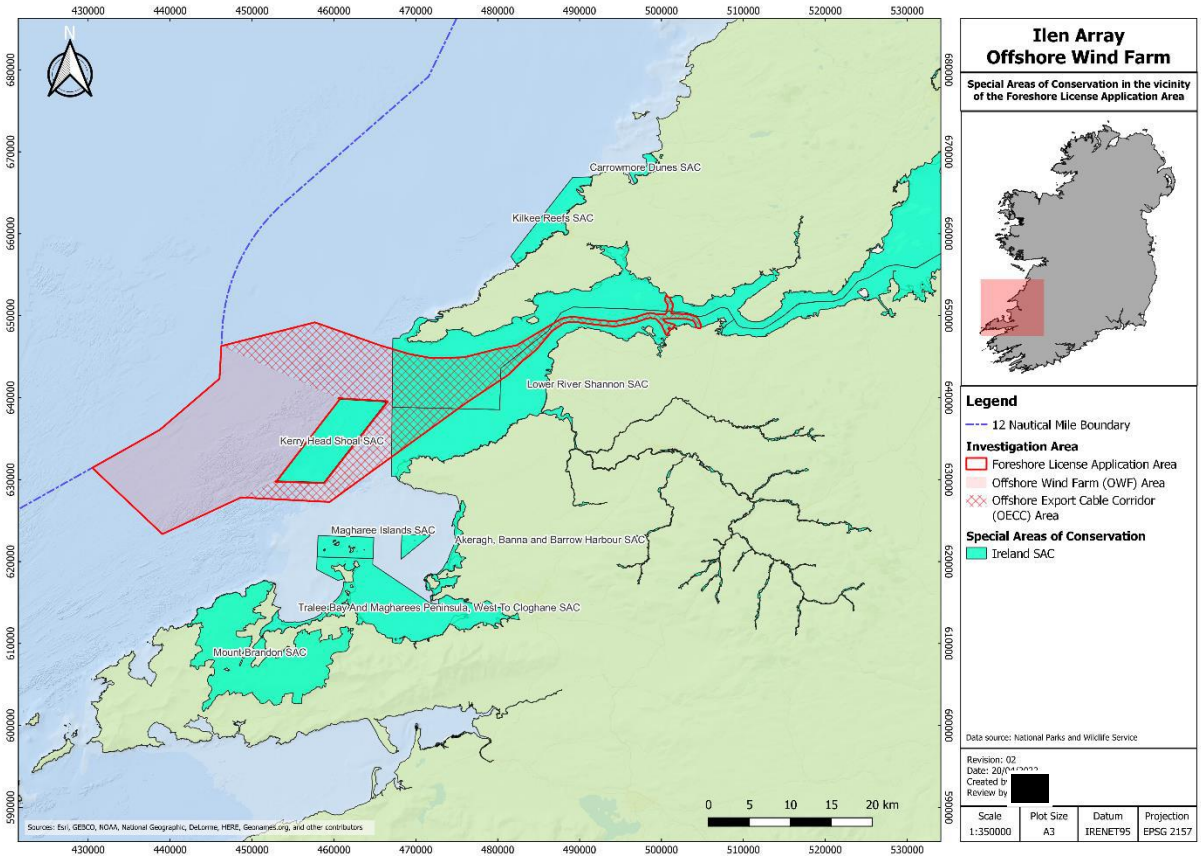

Figure 4-1: Special Areas of Conservation in the vicinity of the Foreshore Licence Application Area

Table 4-1 Special Areas of Conservation in the vicinity of the Foreshore Licence Application Area

SAC	Distance to Site (km)	Site description
Lower River Shannon SAC (002165)	0.00	The Lower River Shannon SAC covers an area of 68300.01 ha and at its closest point lies 6.39 km to the east of the application area. This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the EU Habitats Directive: [1110] Sandbanks, [1130] Estuaries, [1140] Mudflats and sandflats not covered by seawater at low tide, [1150] Coastal Lagoons, [1160] Large Shallow Inlets and Bays, [1170] Reefs, [1220] Perennial Vegetation of Stony Banks, [1230] Vegetated Sea Cliffs, [1310] Salicornia Mud, [1330] Atlantic Salt Meadows, [1410] Mediterranean Salt Meadows, [3260] Floating River Vegetation, [6410] Molinia Meadows, [91E0] Alluvial Forests, [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*), [1095] Sea Lamprey

SAC	Distance to Site (km)	Site description
		(*Petromyzon marinus*), [1096] Brook Lamprey (*Lampetra planeri*), [1099] River Lamprey (*Lampetra fluviatilis),* [1106] Atlantic Salmon (*Salmo salar*), [1349] Bottlenose Dolphin (*Tursiops truncatus)* and [1355] Otter (*Lutra lutra*). This site is of strong ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the EU Habitats Directive, including the priority habitats lagoon and alluvial woodland. It includes the largest resident population of bottlenose dolphin in Ireland and all three lamprey species found in Ireland. A number of species listed on Annex I of the EU Birds Directive are also present, either wintering or breeding
Kerry Head Shoal SAC (002263)	0.04	Kerry Head Shoal SAC covers an area of 5794.72 ha, and although there is no spatial overlap, the application area surrounds the SAC. Kerry Head Shoal, Co. Kerry is situated on the west coast of Ireland, to the north of Tralee Bay and to the west of Kerry Head The site is a Special Area of Conservation (SAC) selected for the habitat [1170] Reefs. The reefs of the Kerry Head Shoal support a remarkably diverse fauna and flora, including the best-known example of the Axinellid sponge community in Ireland. The presence of a number of very rare sponge species (*Tetilla cranium, Axinella flustra, Hexadella racovitzai, T. zetlandica* and *Quasillina brevis*), known from only one or two other locations in Ireland, is of particular note.
Magharee Islands SAC (002261)	4.28	Magharee Islands SAC covers an area of 2270.16 ha and is 4.28km to the south-east of the application area. This marine site is centred around the Magharee Islands, which lie about 2 km north of the Magharee Peninsula in Co. Kerry. The site includes two of the smaller islands, Illaunnabarnagh and Mucklaghmore, which lie about 5 km to the north-east of the main group. The site is a Special Area of Conservation (SAC) selected for the following habitats listed on Annex I of the EU Habitats Directive: [1170] Reefs. This site is of conservation significance in particular for the reefs and associated communities which it hosts. The fact that the site supports important bird colonies adds further to its value.
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)	6.78	Tralee Bay and Magharees Peninsula, West To Cloghane SAC covers an area of 11627.11 ha and at its closest point lies 6.78 km to the south-east of the application area. This large site in Co. Kerry stretches from Tralee town westwards to Fenit Harbour and Cloghane, encompassing Tralee Bay, Brandon Bay and the Magharees Peninsula. It includes extensive mudflats at the eastern end, the beaches of Derrymore Island, the sand dunes and lagoons of the Magharees Peninsula, as well as the rocky headlands at its end. The site includes two Nature Reserves, Tralee Bay and Derrymore Island, and much of the estuarine part of the site has been designated a Special Protection Area (SPA) for birds species and their habitats. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the EU Habitats Directive: [1130] Estuaries, [1140] Mudflats and sandflats not covered by seawater at low tide, [1150] Coastal Lagoons, [1160] Large Shallow Inlets and Bays, [1170] Reefs, [1210] Annual Vegetation of Drift Lines, [1220] Perennial Vegetation of Stony Banks, [1310] Salicornia Mud, [1330] Atlantic Salt Meadows, [1410] Mediterranean Salt Meadows, [2120] Marram Dunes (White Dunes), [2130] Fixed Dunes (Grey Dunes), [2170] Dunes with Creeping Willow, [2190] Humid

SAC	Distance to Site (km)	Site description
		Dune Slacks, [6410] Molinia Meadows, [91E0] Alluvial Forests, [1355] Otter (*Lutra lutra*) and [1395] Petalwort (*Petalophyllum ralfsii*). This site is of considerable ecological and conservation significance for the excellent diversity of habitats it contains, many of which are listed on Annex I of the EU Habitats Directive.
Kilkee Reefs SAC (002264)	8.47	The Kilkee Reefs are situated north of the River Shannon Estuary on the Co. Clare coast. The site stretches for approximately 12 km from Ballard Bay to Castle Point. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive [1160] Large Shallow Inlets and Bays; [1170] Reefs; [8330] Sea Caves.
Mount Brandon SAC (000375)	9.80	Mount Brandon SAC covers an area of 14349.07 ha and at its closest point lies 9.8 km to the south of the application area. This site comprises the central and north-western parts of the Dingle Peninsula. It is a mountainous area that encompasses several peaks including Mount Brandon (952 m), which is the highest peak outside of the Macgillycuddy's Reeks, Brandon Peak (840 m), and the Stradbally range which includes Beenoskee (826 m). The site includes the high sea cliffs of Brandon Head, as well as low-lying areas such as the Owenmore River and Cloghane River valley. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the EU Habitats Directive: [1230] Vegetated Sea Cliffs, [3110] Oligotrophic Waters containing very few minerals, [3130] Oligotrophic to Mesotrophic Standing Waters, [4010] Wet Heath, [4030] Dry Heath, [4060] Alpine and Subalpine Heaths, [6230] Species-rich Nardus Grassland, [7130] Blanket Bogs (Active), [8110] Siliceous Scree, [8210] Calcareous Rocky Slopes, [8220] Siliceous Rocky Slopes, [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*) and [1421] Killarney Fern (*Trichomanes speciosum*). The site is of high conservation value due to the presence of good quality examples of 11 habitats that are listed on Annex I of the EU Habitats Directive, as well as populations of two species that are listed on Annex II of this Directive. The presence of the EU Birds Directive Annex I species, Chough and Peregrine, as well as of populations of a range of rare Red Data Book plant species, adds considerably to the significance of the site.
Akeragh, Banna and Barrow Harbour SAC (000332)	11.56	Akeragh, Banna and Barrow Harbour SAC is a large coastal site covering a 10 km section of coastline in Co. Kerry and including a wide diversity of habitats. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive: [1210] Annual Vegetation of Drift Lines; [1310] Salicornia Mud; [1330] Atlantic Salt Meadows; [1410] Mediterranean Salt Meadows; [2110] Embryonic Shifting Dunes; [2120] Marram Dunes (White Dunes); [2130] Fixed Dunes (Grey Dunes); [2190] Humid Dune Slacks; [4030] Dry Heath. This large site is of major ecological interest due both to its range of floristically-rich coastal habitats, nine of which are listed on Annex I of the E.U. Habitats Directive, including one priority habitat, and as a wintering site for significant numbers of waterfowl (including two Annex I species).
Carrowmore Dunes SAC (002250)	14.13	Carrowmore Dunes are situated on the south-western coast of Co. Clare, roughly midway between Milltown Malbay and Kilkee, and extend from

SAC	Distance to Site (km)	Site description
		Carrowmore Point in the north to Doonbeg Bay in the south. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive: 1170] Reefs; [2110] Embryonic Shifting Dunes; [2120] Marram Dunes (White Dunes); [2130] Fixed Dunes (Grey Dunes); [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*). The Carrowmore Dunes site is of considerable conservation significance, supporting good examples of four habitats that are listed on Annex I of the E.U. Habitats Directive, as well as a population of the rare Annex II snail, *Vertigo angustior*.

4.2.2 Special Areas of Conservation and Qualifying Interest: Annex II Species

Annex II of the EU Habitats Directive lists species whose conservation requires the designation of Special Areas of Conservation. Under this Directive, the harbour porpoise (Phocoena phocoena), bottlenose dolphin (Tursiops truncatus), grey seal (Halichoerus grypus), common seal (Phoca vitulina) and Eurasian otter (Lutra lutra) are designated Annex II mammal species which are of community interest and whose conservation requires the designation of Special Areas of Conservation. In addition, four migratory fish species (freshwater to the marine and back) are also included in Annex II and have special areas of conservation falling within the zone of influence of the site investigation activities (given known factors relating to the species e.g. migratory routes, marine spatial distribution, preferred water depths). The marine and marine/freshwater species are listed in (Table 4-2).

Table 4-2 Annex II Species

Marine Species		
1349	Bottlenose dolphin	*Tursiops truncatus*
1351	Harbour porpoise	*Phocoena phocoena*
1364	Grey seal	*Halichoerus grypus*
1365	Common seal	*Phoca vitulina*
Coastal and Inland Species		
1095	Sea lamprey	*Petromyzon marinus*
1099	River lamprey	*Lampetra fluviatilis*
1103	Twaite shad	*Alosa fallax fallax*
1355	Otter	*Lutra lutra*
1106	Salmon	*Salmo salar*

There are 48 coastal sites that have been designated as Special Areas of Conservation under Annex II of the Habitats Directive which have mobile marine or partially marine species as qualifying interests. All have between one and five species which are mobile and have the potential to be present within the application area. These SACs are shown in Figures 4-2 and 4-3 and summarised in Table 4-3.

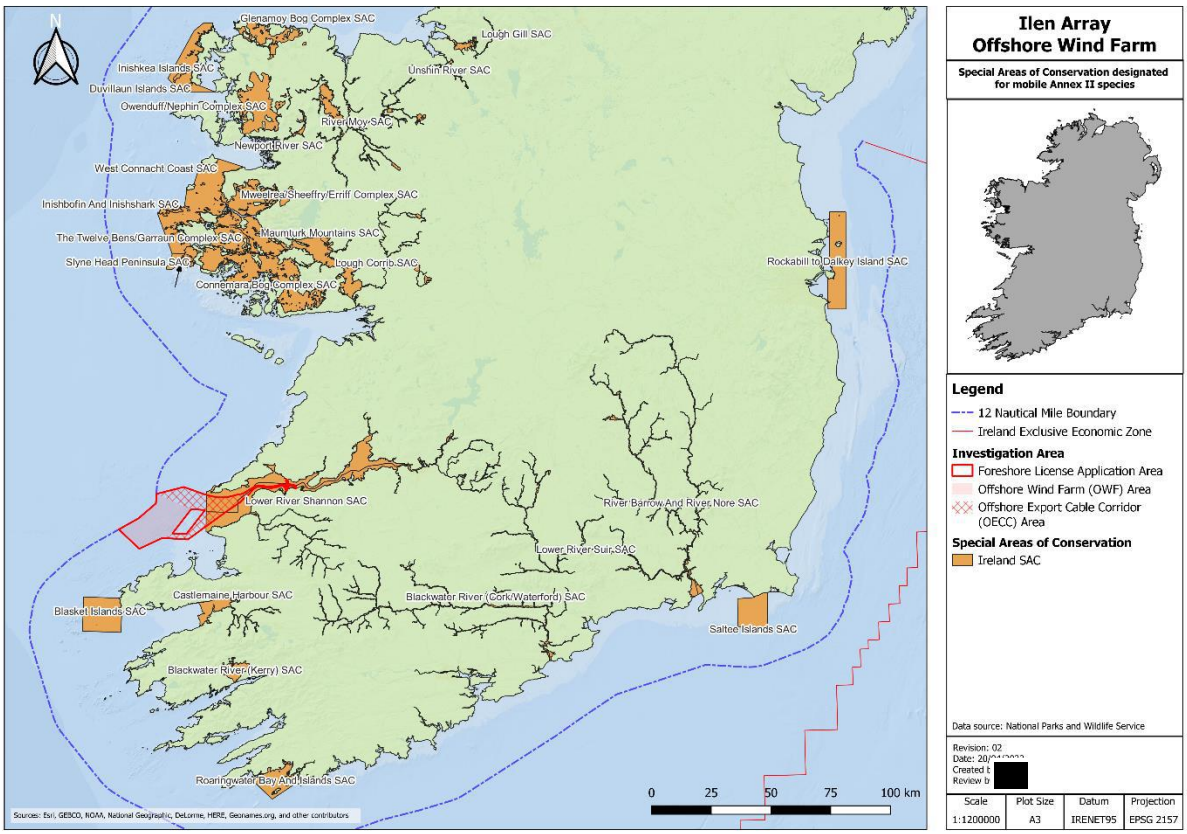

Figure 4-2: Irish Special Areas of Conservation designated for Annex II species relevant to the activities proposed within the Foreshore Licence Application Area

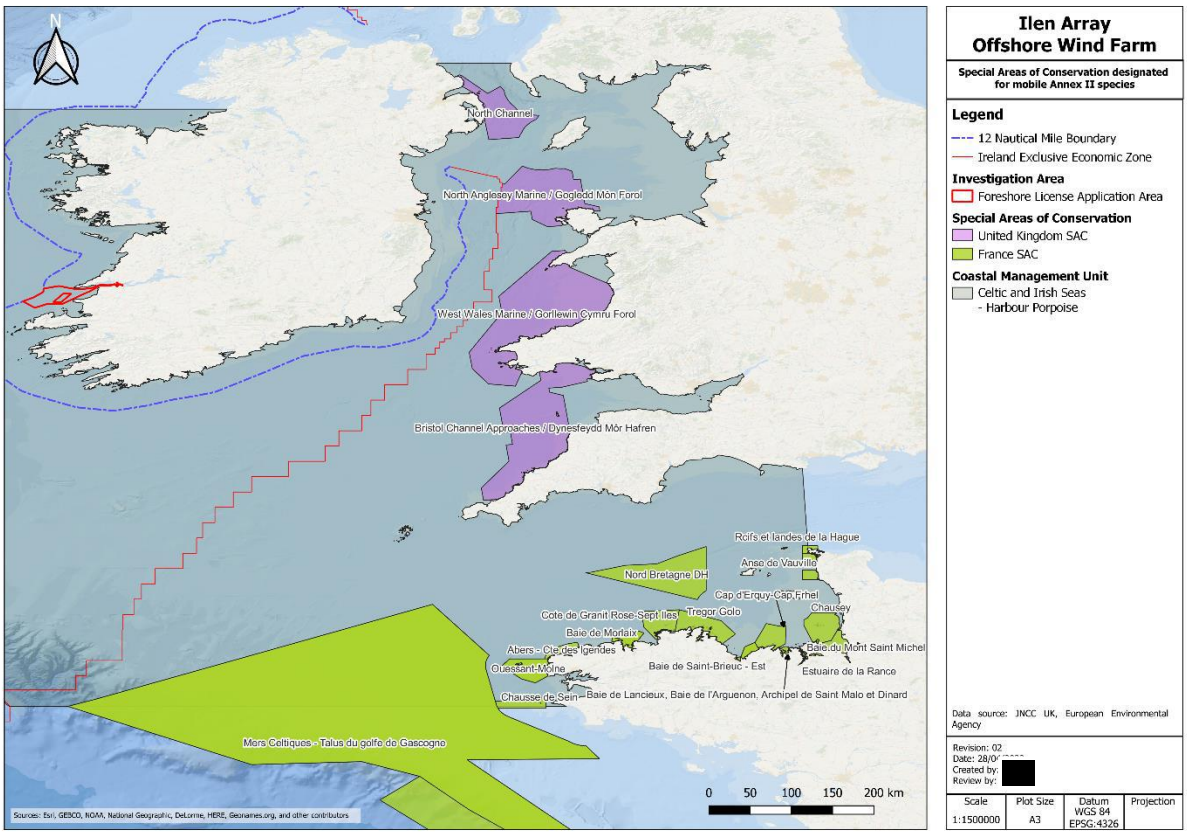

Figure 4-3: UK and French Special Areas of Conservation designated for Annex II species relevant to the activities proposed within the Foreshore Licence Application Area

Table 4-3: Distance to Irish, UK and French Special Areas of Conservation with Annex II species relevant to the activities proposed within the Foreshore Licence Application Area

Site Name	Mobile Annex II Species	Distance to Site (km)
Lower River Shannon SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Lutra lutra* (Otter) [1355]	0.00
Tralee Bay and Magharees Peninsula, West to Cloghane SAC	*Lutra lutra* (Otter) [1355]	6.78
Blasket Islands SAC	*Phocoena phocoena* (Harbour porpoise) [1351] *Halichoerus grypus* (Grey Seal) [1364]	22.89
Castlemaine Harbour SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	26.64
Blackwater River (Kerry) SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	52.61
Slyne Head Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364]	91.40
Connemara Bog Complex SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	91.62
Slyne Head Peninsula SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	92.11

Site Name	Mobile Annex II Species	Distance to Site (km)
West Connacht Coast SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	98.47
Lough Corrib SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	103.48
Maumturk Mountains SAC	*Salmo salar* (Salmon) [1106]	110.52
The Twelve Bens/Garraun Complex SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	111.56
Inishbofin and Inishshark SAC	*Halichoerus grypus* (Grey Seal) [1364]	114.99
Roaringwater Bay and Islands SAC	*Lutra lutra* (Otter) [1355] *Halichoerus grypus* (Grey Seal) [1364] *Phocoena phocoena* (Harbour porpoise) [1351]	136.61
Mweelrea/Sheeffry/Erriff Complex SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	137.29
Duvillaun Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364]	168.83
Inishkea Islands SAC	*Halichoerus grypus* (Grey Seal) [1364]	170.79
Newport River SAC	*Salmo salar* (Salmon) [1106]	172.54
Owenduff/Nephin Complex SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	188.99
Glenamoy Bog Complex SAC	*Salmo salar* (Salmon) [1106]	209.53
River Moy SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	275.41
Blackwater River (Cork/Waterford) SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Alosa fallax* (Twaite shad) [1103]	284.33
Unshin River SAC	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	303.02
River Barrow and River Nore SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	345.57
Saltee Islands SAC	*Halichoerus grypus* (Grey Seal) [1364]	353.90
Lower River Suir SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Alosa fallax* (Twaite shad) [1103]	360.60
Rockabill to Dalkey Island SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	504.86
West Wales Marine	*Phocoena phocoena* (Harbour porpoise) [1351]	419.39
Bristol Channel Approaches	*Phocoena phocoena* (Harbour porpoise) [1351]	440.19
North Anglesey Marine	*Phocoena phocoena* (Harbour porpoise) [1351]	531.38
North Channel	*Phocoena phocoena* (Harbour porpoise) [1351]	613.27

Site Name	Mobile Annex II Species	Distance to Site (km)
Mers Celtiques - Talus du Golfe de Gascogne	*Phocoena phocoena* (Harbour porpoise) [1351]	460.66
Nord Bretagne DH	*Phocoena phocoena* (Harbour porpoise) [1351]	570.94
Ouessant-Molène	*Phocoena phocoena* (Harbour porpoise) [1351]	588.15
Abers - Côte des Legendes	*Phocoena phocoena* (Harbour porpoise) [1351]	602.07
Chaussée de Sein	*Phocoena phocoena* (Harbour porpoise) [1351]	617.28
Côte de Granit Rose-Sept-Iles	*Phocoena phocoena* (Harbour porpoise) [1351]	632.89
Baie de Morlaix	*Phocoena phocoena* (Harbour porpoise) [1351]	634.22
Tregor Goëlo	*Phocoena phocoena* (Harbour porpoise) [1351]	657.98
Cap d'Erquy - Cap Fréhel	*Phocoena phocoena* (Harbour porpoise) [1351]	725.95
Baie de Saint-Brieuc - Est	*Phocoena phocoena* (Harbour porpoise) [1351]	726.35
Récifs et Landes de la Hague	*Phocoena phocoena* (Harbour porpoise) [1351]	726.56
Anse de Vauville	*Phocoena phocoena* (Harbour porpoise) [1351]	729.59
Banc et Récifs de Surtainville	*Phocoena phocoena* (Harbour porpoise) [1351]	732.58
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	*Phocoena phocoena* (Harbour porpoise) [1351]	749.41
Chausey	*Phocoena phocoena* (Harbour porpoise) [1351]	755.70
Estuaire de la Rance	*Phocoena phocoena* (Harbour porpoise) [1351]	766.30
Baie du Mont Saint-Michel	*Phocoena phocoena* (Harbour porpoise) [1351]	774.22

Table 4-4 Short Synopsis of Qualifying Interest Annex II Species by SACs relevant to this Foreshore Licence Application

Species	Summary information	Relevant Sites
Bottlenose Dolphin *(Tursiops truncatus)*	The bottlenose dolphin is familiar from around the Irish coast with resident population in the Shannon River, Cork Harbour, north Connemara and Mayo.	Lower River Shannon SAC Slyne Head Islands SAC Slyne Head Peninsula SAC West Connacht Coast SAC Duvillaun Islands SAC
Harbour Porpoise *(Phocoena phocoena)*	The harbour porpoise is the smallest and most abundant cetacean in Irish waters and possibly the most abundant in the northeast Atlantic. It is common around the entire Irish coast. Sightings are common from June through the autumn/winter	Blasket Islands SAC Roaringwater Bay and Islands SAC Rockabill to Dalkey Island SAC West Wales Marine SAC North Anglesey Marine SAC Bristol Channel Approaches SAC North Channel SAC

Species	Summary information	Relevant Sites
	period but reduced sightings in spring suggest they move offshore, possibly to calving/breeding grounds.	Mers Celtiques - Talus du Golfe de Gascogne SAC Nord Bretagne DH SAC Ouessant-Molène SAC Abers - Côte des Legendes SAC Chaussée de Sein SAC Côte de Granit Rose-Sept-Iles SAC Baie de Morlaix SAC Tregor Goëlo SAC Cap d'Erquy - Cap Fréhel SAC Baie de Saint-Brieuc Est SAC Récifs et landes de la Hague SAC Anse de Vauville SAC Banc et Récifs de Surtainville SAC Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC Chausey SAC Estuaire de la Rance SAC Baie du Mont Saint-Michel SAC
Grey Seal *(Halichoerus grypus)*	The grey seal is the larger and more abundant of the two seals resident in Ireland. They spend much of the year at sea and may range widely in search of prey. They come ashore in autumn to form breeding colonies on rocky shores, beaches and caves – often on small uninhabited islands. They are found all around the coast wherever habitats are suitable and are most abundant along the exposed south, southwest and west coasts. The two major Irish breeding sites for grey seals are the Inishkea Islands (Mayo) and the Blasket Islands (Kerry). Smaller groups breed at Lambay Island (Dublin), Slyne Head (Galway) and the Saltee Islands (Wexford).	Blasket Islands SAC Slyne Head Islands SAC Roaringwater Bay and Islands SAC Inishbofin and Inishshark SAC Duvillaun Islands SAC Inishkea Islands SAC Saltee Islands SAC
Common seal (*Phoca vitulina*)	The common, or harbour seal is the smaller of the two seals resident in Ireland. The common seal is the characteristic seal of sandflats and estuaries but are also found on rocky shores. Seals may range in search of prey, but individuals often return to favoured haul-out sites to rest or to give birth. Harbour seals have comparatively short-range movements in relation to grey seals (NPWS, 2019b), with typical foraging ranges being less than 20 km from haulout sites (Cronin *et al.,* 2010; Carter *et al*., 2021).	There are no SACs designated for the common seal within the potential influence of the Foreshore Licence Application Area.
Sea Lamprey *(Petromyzon marinus)*	The sea lamprey is a primitive, jawless fish resembling an eel. It occurs in estuaries and easily accessible rivers and is a migratory species, spawning in freshwater but completing its life cycle in the sea (anadromous). The species migrates from the sea to freshwater in April/May, where they spawn in late May and then return to sea.	Lower River Shannon SAC Castlemaine Harbour SAC Lough Corrib SAC Blackwater River (Cork/Waterford) SAC Lower River Suir SAC River Moy SAC River Barrow and River Nore SAC

Species	Summary information	Relevant Sites
River Lamprey *(Lampetra fluviatilis)*	The river lamprey is a migratory species and predominantly anadromous, breeding in freshwater as adults with offspring migrating to sea after a freshwater phase prior to maturation. Migration from the sea to freshwater occurs in October to December where they spawn in late March/April and then return to sea.	Lower River Shannon SAC Castlemaine Harbour SAC Blackwater River (Cork/Waterford) SAC Lower River Suir SAC River Barrow and River Nore SAC
Twaite Shad *(Alosa fallax fallax)*	Little is known about the marine habits of the Twaite Shad. They are known to favour water depths of 10 to 110 meters but have been found in deeper waters.	Blackwater River (Cork/Waterford) SAC Lower River Suir SAC
Atlantic Salmon *(Salmo salar)*	The salmon is an anadromous fish which spawns in rivers and is only offered protection under Annex II of the Habitats Directive when in its freshwater habitat and is not subject to the same protection in its seawater habitat.	Lower River Shannon SAC Castlemaine Harbour SAC Blackwater River (Kerry) SAC Connemara Bog Complex SAC The Twelve Bens/Garraun Complex SAC Lough Corrib SAC Mweelrea/Sheeffry/Erriff Complex SAC Maumturk Mountains SAC Blackwater River (Cork/Waterford) SAC Owenduff/Nephin Complex SAC Newport River SAC Lower River Suir SAC River Moy SAC River Barrow and River Nore SAC Unshin River SAC Glenamoy Bog Complex SAC
Otter *(Lutra lutra)*	The otter is a semi-aquatic mammal, which occurs in a wide variety of aquatic habitats such as rivers, streams, lakes, estuaries and on the coast. Populations in coastal areas use shallow, inshore marine areas for feeding but they also require access to fresh water for bathing and terrestrial areas for resting and breeding. Coastal otter habitat ranges from sheltered wooded inlets to more open, low-lying coasts. In Ireland, the territory of female otters is 6.5 ± 1.0 km in coastal environments (de Jongh *et al*. 2010) and for males may be larger extent; it has been suggested that the otter's range is approximately 12 km along the coast and 80 m seaward (NWPS, 2015e, NPWS, *Lutra lutra* (1355) Conservation Status Assessment Report). The otter is found throughout Ireland, which has the densest otter population in western Europe. Over most of the continent the species is scarce to extinct,	Lower River Shannon SAC Tralee Bay and Magharees Peninsula, West to Cloghane SAC

Species	Summary information	Relevant Sites
	making the Irish population of otters particularly important.	

Table 4-5 Overview of sites designated for mobile marine species for Irish, UK and French SACs relevant to the proposed activities for the Foreshore Licence Application Area

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
Lower River Shannon SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Lutra lutra* (Otter) [1355]	There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries.
Tralee Bay and Magharees Peninsula, West to Cloghane SAC	*Lutra lutra* (Otter) [1355]	This large site in Co. Kerry stretches from Tralee town westwards to Fenit Harbour and Cloghane, encompassing Tralee Bay, Brandon Bay and the Magharees Peninsula. It includes extensive mudflats at the eastern end, the beaches of Derrymore Island, the sand dunes and lagoons of the Magharees Peninsula, as well as the rocky headlands at its end. The site includes two Statutory Nature Reserves, Tralee Bay and Derrymore Island, and much of the estuarine part of the site has been designated a Special Protection Area (SPA) for birds and their habitats. Otters regularly feed within this extensive site though it is not known if they breed.
Castlemaine Harbour SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106]	This is a large site located on the south-east corner of the Dingle Peninsula, Co. Kerry. It consists of the whole inner section of Dingle Bay, i.e. Castlemaine Harbour, the spits of Inch and White Strand/Rosbehy and a little of the coastline to the west. Castlemaine Harbour is of major ecological importance. It contains a range of coastal habitats of excellent quality, including many that are listed on Annex I of the E.U. Habitats Directive, and two which are listed with priority status (fixed dunes and alluvial forests). It also includes long

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
		stretches of river and stream which are excellent habitats for Salmon, Lamprey and Otter.
Blasket Islands SAC	*Phocoena phocoena* (Harbour porpoise) [1351] *Halichoerus grypus* (Grey Seal) [1364]	The site has a large Grey Seal population (648-833 breeding in 2005; one-off moult count of 989 seals in 2007). This is one of the largest populations in the country and represents about one-third of the Irish population. The site is also of importance for Harbour Porpoise, a species which has a regular presence in Blasket Sound. A population estimate in 2008 gave a figure of 267-477 individuals
Blackwater River (Kerry) SAC	*Salmo salar* (Salmon) [1106]	This large site is situated on the south-western slopes of the Macgillycuddy Reeks in Co. Kerry and overlooks the Kenmare River inlet. The rivers have good populations of Brown Trout, and provide spawning grounds for Sea Trout and Salmon. Overall, the site is considered of high importance for the conservation of the Salmon. Otter occurs throughout the site.
Slyne Head Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364]	This site comprises a long archipelago of islands, islets, rocks and reefs located off the western shores and south-western tip of the Slyne Head Peninsula in Co. Galway. The surrounding shallow marine areas are also included as part of the site. The site contains an important breeding colony of Grey Seal, a species listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 238- 306 individuals (in 2005). A one-off moult count in 2007 gave a figure of 162 seals. Waters within the site also support groups of the Annex II species Bottlenose Dolphin (*Tursiops truncatus*) that are likely to be part of a population inhabiting the west and north coasts of Connacht and which numbers at least 177-337 dolphins.
Slyne Head Peninsula SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	This site comprises the peninsula west of Ballyconneely, Co. Galway. It extends northwards to Errislannan Point to include the shallow waters of Mannin Bay. The site is of marine conservation importance due to the occurrence of groups of Bottlenose Dolphin, a species listed on Annex II of the Directive.
Connemara Bog Complex SAC	*Salmo salar* (Salmon) [1106]	The Connemara Bog Complex SAC is a large site encompassing the majority of the south Connemara lowlands in Co. Galway. Atlantic Salmon, a species listed under Annex II of the E.U. Habitats Directive, occurs in many of the rivers within the site. Otter have been recorded as occurring in the Connemara Bog Complex.
West Connacht Coast SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	This site consists of a substantial area of marine waters lying off the coasts of Counties Mayo and Galway in the

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
		west of Ireland. Comprising two parts, in its northern component the site extends from the coastal waters off Erris Head westwards beyond Eagle Island and the Mullet Peninsula in Co. Mayo. From there it extends southwards immediately off the coast as far as the entrance to Blacksod Bay.
The Twelve Bens/Garraun Complex SAC	*Salmo salar* (Salmon) [1106]	This is an extensive site situated in the north-west of Connemara in Co. Galway and dominated by mountainous terrain. The site is bounded to the south by the Connemara Bog Complex, to the east by the Maumturk Mountains and to the north by Killary Harbour. Otter recorded from the site. The Owenglin River supports an important population of Salmon.
Roaringwater Bay and Islands SAC	*Halichoerus grypus* (Grey Seal) [1364] *Phocoena phocoena* (Harbour porpoise) [1351]	Grey Seal is present at the site throughout the year A minimum population for all ages was estimated at 116-149 in 2005. Roaringwater Bay may be one of the most important sites in Ireland for Harbour Porpoise. Harbour Porpoise in Irish waters are largely resident and observations have shown that they are regular in the waters of Roaringwater Bay. Most observations are in the autumn, when more than 100 individuals have been recorded in a day. The population has been estimated (in 2008) to be 117-201 individuals.
Lough Corrib SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Salmo salar* (Salmon) [1106]	Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). Atlantic Salmon (*Salmo salar*) use the lake and rivers as spawning grounds. The lake has a population of Sea Lamprey (*Petromyzon marinus*), a scarce, though probably under-recorded species listed on Annex II of the E.U. Habitats Directive and otter (*Lutra lutra*) have been recorded regularly within the site.
Inishbofin and Inishshark SAC	*Halichoerus grypus* (Grey Seal) [1364]	This site is situated off the Co. Galway coast, about 5.5 km from the mainland. It comprises two main islands, Inishbofin and Inishshark, with several islets and stacks. Part of the surrounding marine waters are also included. The site supports a breeding colony of Grey Seal, a species that is listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 749-963 individuals (in 2005). A one-off moult count in 2007 gave a figure of 270 seals.
Mweelrea/Sheeffry/Erriff Complex SAC	*Salmo salar* (Salmon) [1106]	The Mweelrea/Sheeffry/Erriff Complex SAC covers a large area of the scenic hills of south Co. Mayo. The western limit of the site is at Dooaghtry, south of Kinnadoohy. The southern margin is bounded by Killary Harbour and the Erriff River, including the corrie of Lough Glenawough. The Aille River forms the eastern

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
		limit, and to the north the boundary includes the main massifs of the Sheeffry Hills and the Mweelrea Mountains. The Erriff River system supports an important population of Salmon (*Salmo salar*). Otters are known to breed in the lakes at this site, and this species is also listed on Annex II of the E.U. Habitats Directive.
Maumturk Mountains SAC	*Salmo salar* (Salmon) [1106]	The Maumturk Mountains are situated east of the Twelve Bens and west of the Maumtrasnas, between the Inagh Valley and the Leenaun/Maam road in Co. Galway. The site is bounded to the north by Killary Harbour and to the south by the Galway/ Clifden road. The site is very important for salmon, a species listed on Annex II of the E.U. Habitats Directive. The rivers and lakes, and especially the Bealnabrack system, provide high quality spawning and nursery rivers Spawning salmon and trout occur in Maumwee Lough, and perhaps others.
Blackwater River (Cork/Waterford) SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Alosa fallax* (Twaite shad) [1103]	The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. The site is important for the presence of several E.U. Habitats Directive Annex II animal species, including sea lamprey, river lamprey, twaite shad, otter and salmon. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers.
Owenduff/Nephin Complex SAC	*Salmo salar* (Salmon) [1106]	This large area of relatively intact blanket bog and mountains incorporates the catchment of the Owenduff River and much of the Nephin Beg Mountain range, and is situated in Co. Mayo. The site provides extensive areas of habitat for Otter, a species that is listed on Annexes II and IV of the E.U. Habitats Directive. The Owenduff River system holds an important population of Atlantic Salmon, another species listed on Annex II.
Newport River SAC	*Salmo salar* (Salmon) [1106]	The Newport River itself is relatively short, flowing from Beltra Lough to the sea at Newport, Co. Mayo. This site consists of the Newport River, Lough Beltra, and the tributaries the Skerdagh, Glenisland Crumpaun/Boghadoon and Bracklagh/Cloondaff. The Newport River is a renowned salmonid river and hosts Atlantic Salmon. The river gets a good run of spring salmon and many large fish are caught every year. This system has traditionally been regarded as an excellent spring salmon, grilse and sea trout fishery
Lower River Suir SAC	*Petromyzon marinus* (Sea Lamprey) [1095]	Lower River Suir SAC consists of the freshwater stretches of the River Suir immediately south of

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
	Lampetra fluviatilis (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Alosa fallax* (Twaite shad) [1103]	Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford, and many tributaries including the Clodiagh in Co. Waterford, the Lingaun, Anner, Nier, Tar, Aherlow, Multeen and Clodiagh in Co. Tipperary. The site is of particular conservation interest for the presence of a number of Annex II animal species, including Salmon, Twaite Shad (Alosa fallax fallax), three species of Lampreys - Sea Lamprey, Brook Lamprey and River Lamprey, and Otter. This is one of only three known spawning grounds in the country for Twaite Shad.
River Moy SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Salmo salar* (Salmon) [1106]	This site comprises almost the entire freshwater element of the River Moy and its tributaries. The Moy system is one of Ireland's premier salmon waters and it also encompasses two of Ireland's best lake trout fisheries in Loughs Conn and Cullin. The site is also important for the presence of four other species listed on Annex II of the E.U. Habitats Directive, namely Sea Lamprey, Brook Lamprey, Otter and Whiteclawed Crayfish. The Sea Lamprey is regularly encountered in the lower stretches of the river around Ballina.
Duvillaun Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364]	The Duvillaun Islands comprise a group of marine islands, rocks and reefs 3 km off the southern tip of the Mullet Peninsula, Co. Mayo. The Duvillaun Islands form part of a larger group of islands, together with the Inishkeas, Inishkeeragh and Inishglora, which hold an important breeding population of Grey Seal. The breeding population is estimated at 648-833 individuals (in 2005). Waters around the Duvillaun Islands support groups of Bottlenose Dolphin (*Tursiops truncatus*) that are part of a population inhabiting the west and north coasts of Connacht and which numbers at least 177-337 dolphins
River Barrow and River Nore SAC	*Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106]	This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including salmon, twaite shad, sea lamprey, river lamprey and otter. This site is one of only a handful of spawning grounds in the country for twaite shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
		and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.
Inishkea Islands SAC	*Halichoerus grypus* (Grey Seal) [1364]	The Inishkea Islands are the two largest islands off the west coast of the Mullet Peninsula in north-west Co. Mayo. The Inishkeas, together with a group of neighbouring islands, including Inishglora, Inishkeeragh and the Duvillauns, are an important breeding site for Grey Seal, a species listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 665-855 individuals (in 2005). A one-off moult count in 2007 gave a figure of 1,742 seals.
Unshin River SAC	*Salmo salar* (Salmon) [1106]	The Unshin River runs from Lough Arrow north to Ballysadare Bay, Co. Sligo. The Unshin and its tributaries is the most important salmon producing river in Co. Sligo. The system also supports a good population of Trout. The Annex II species Otter has been recorded in and near this site.
Saltee Islands SAC	*Halichoerus grypus* (Grey Seal) [1364]	This site comprises the Saltees Islands and a large area of the surrounding seas. There are two islands, Great Saltee and Little Saltee, and a constellation of islets and rocks. Great Saltee has a breeding population of grey seal, one of the very few in eastern Ireland. The breeding population was estimated at 571-744 individuals in 2005. A one-off moult count in 2007 gave a figure of 246 individuals.
Glenamoy Bog Complex SAC	*Salmo salar* (Salmon) [1106]	This large site is situated in the extreme north-west of Co. Mayo, where the climate is wet oceanic, and gales from the Atlantic are frequent. The Glenamoy River is predominantly a western, acidic, spate river which has a valuable late run of salmon (*Salmo salar*) in July, with good spawning habitats and good water quality. Sea Trout are also found.
Rockabill to Dalkey Island SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	The area selected for designation represents a key habitat for the Annex II species harbour porpoise (*Phocoena phocoena*) [1351], within the Irish Sea. The species occurs year-round within the site and comparatively high group sizes have been recorded. Porpoises with young (i.e. calves) are observed at favourable, typical reference values for the species. The site contains a wide array of habitats believed to be important for harbour porpoise including inshore shallow sand and mudbanks and rocky reefs scoured by strong current flow.
West Wales Marine	*Phocoena phocoena* (Harbour porpoise) [1351]	Situated off the coast of Wales from the Llŷn peninsula in the north, to Pembrokeshire in the south-west, the West Wales Marine SAC has been identified as an area

SAC Name	Mobile Annex II Species	Overview of site relevant to QI
		of importance for harbour porpoise. The site is three times the size of Snowdonia National Park, covering 7,376 km^2.
North Anglesey Marine	*Phocoena phocoena* (Harbour porpoise) [1351]	North Anglesey Marine / Gogledd MÃ´n Forol SAC (3,249km2) is made up of marine areas and sea inlets (NRW, 2016a). According to JNCC (2019) the site supports an estimated 2.4% of the UK Celtic and Irish Seas Management Unit (MU) of harbour porpoise population and occurs within the top 10% of persistent high-density areas for harbour porpoise in UK waters for the summer season.
Bristol Channel Approaches	*Phocoena phocoena* (Harbour porpoise) [1351]	Marine SAC supporting harbour porpoise "For which this is considered to be one of the best areas in the United Kingdom".
North Channel	*Phocoena phocoena* (Harbour porpoise) [1351]	Located along the eastern coast of Northern Ireland, the North Channel SAC has been identified as an important winter area for harbour porpoise Phocoena phocoena, supporting an estimated 1.2% of the UK Celtic and Irish Seas Management Unit (MU) population. Although small compared to most of the harbour porpoise SACs, this site, with an area of 1,604 km^2, supports areas where large groups of up to 100 Harbour Porpoise have been sighted.
French SACs (Various)	*Phocoena phocoena* (Harbour porpoise) [1351]	There are a further 12 SACs designated for harbour porpoise Northern French coast. The harbour porpoise are within the Celtic and Irish Seas Management Unit, the nearest site is 541km away from the proposed foreshore licence application area; they are not described further here.

4.2.3 Special Protection Areas,Special Conservation Interests (SCI) (Birds)

Ireland is host to several nationally and internationally important bird species which inhabit areas such as coastal sea cliffs, estuaries and offshore islands. Many of these areas have therefore been designated as Special Protection Areas (SPA) under the Birds Directive. Coastal habitats provide important breeding sites for many species of seabirds, several of which are protected under national and European legislation.

At least 45 species of seabird (including divers and grebes) have been recorded during at-sea surveys in Irish waters, of which 23 species regularly breed around Ireland (Mackey *et al*., 2004). In addition, a further 59 species of waterfowl and wader regularly occur at coastal sites such as estuaries around Ireland: including 5 grebe species, 2 heron species, 26 species of wildfowl and 26 wader species (Crowe, 2005). Some of these species are migratory and are present only during migration periods in spring and autumn; others come to Ireland to breed or to spend the winter, while some are resident all year round.

It is acknowledged that there is limited data in relation to effects on diving birds from underwater noise and that the Foreshore Licence Application Area is within the mean max foraging distances (Table 4-1) of several species of diving birds which are Qualifying Interests of relevant SPAs (i.e. guillemot, razorbill, northern gannet and Manx shearwater). However, considering the lack of reported effects of underwater noise levels generated by site investigations for offshore wind data gathering purposes on diving birds, the much lower power of the potential sources of underwater noise in the proposed site investigation activities when compared to those used for exploration activities in the oil and gas industry, and the very small spatial footprint and short duration of the planned site investigation activities, it is concluded that significant effects on diving birds due to underwater noise are considered not likely.

Similarly, given that bird densities decrease as they move away from their colonies and considering the distance of the Foreshore Licence Application Area from these SPAs (see Appendix I), any disturbance as a result of one or two additional slow-moving vessels during the proposed site investigation activities would result in very minor and temporary disturbance or displacement to individual birds in the vicinity of the site investigation activities only. Therefore, it is concluded that there are no likely significant effects on the SPAs and their relevant bird species listed in Appendix II from the proposed site investigation activities and they are not assessed further in this report.

The nine SPAs that are included for an Appropriate Assessment Stage 1 Screening are:

- River Shannon and River Fergus Estuaries SPA
- Loop Head SPA
- Kerry Head SPA
- Magharee Islands SPA
- Tralee Bay Complex SPA
- Dingle Peninsula SPA
- Illaunonearaun SPA
- Mid-Clare Coast SPA
- Blasket Islands SPA

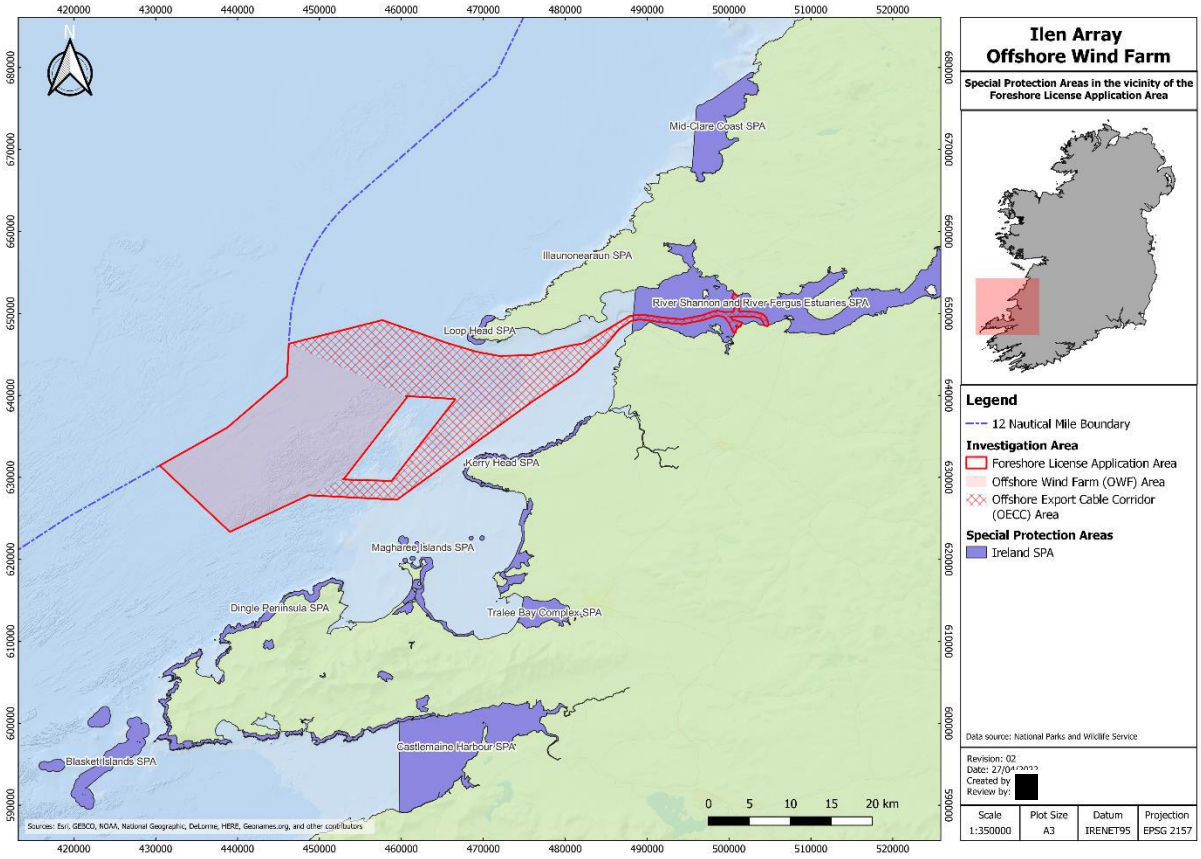

Figure 4-4: Special Protection Areas close to the Foreshore Licence Application Area considered relevant to this report

Table 4-6 Distances to Special Protection Areas within the potential influence of the Foreshore Licence Application Site Investigation

Special Protection Area Name (SPA code)	Distance to Site (km)
River Shannon and River Fergus Estuaries SPA	0.00
Loop Head SPA	0.80
Kerry Head SPA	1.13
Magharee Islands SPA	4.44
Tralee Bay Complex SPA	7.61
Dingle Peninsula SPA	8.68
Illaunonearaun SPA	8.68
Mid-Clare Coast SPA	14.22
Blasket Islands SPA	25.26

Table 4-7 Special Protection Areas considered relevant for assessment within the vicinity of the Foreshore Licence Application Area

SPA	Site description
River Shannon and River Fergus Estuaries SPA	The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Whooper Swan, Lightbellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Scaup, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank and Black-headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl–, a concentration easily of international importance. The site has internationally important populations of Light-bellied Brent Goose, Dunlin, Black-tailed Godwit and Redshank. A further 17 species have populations of national importance, i.e. Cormorant (245), Whooper Swan, Shelduck, Wigeon, Teal, Pintail, Shoveler, Scaup, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Bar-tailed Godwit, Curlew, Greenshank and Black-headed–. The site is among the most important in the country for several of these species, notably Dunlin, Lapwing and Redshank. The site also supports a nationally important breeding population of Cormorant. Other species that occur include Mute Swan, Mallard, Red-breasted Merganser, Great Crested Grebe, Grey Heron, Oystercatcher, Turnstone and Common Gull–. Apart from the wintering birds, large numbers of some species also pass through the site whilst on migration in spring and/or autumn.
Loop Head SPA	Loop Head SPA is situated at the most westerly point in Co. Clare, approximately 20 km south-west of Kilkee. The site includes the cliffs, shoreline and the adjacent marine area to a distance of 500 m from the shore. The site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Kittiwake and Guillemot. The cliffs support large numbers of breeding seabirds. The Kittiwake and Guillemot populations are of national importance. The site is also utilised by breeding Chough. The birds nest on the cliffs and feed on the cliff top grassland and heath. Loop Head is also a traditional site for Peregrine Falcon. Loop Head SPA is of high ornithological importance as it supports two seabird species, Kittiwake and Guillemot, with populations of national importance. Two

SPA	Site description
	species, Chough and Peregrine, which are listed on Annex I of the EU Birds Directive, breed here in small numbers.
Kerry Head SPA	Kerry Head SPA is situated on the south side of the mouth of the River Shannon in north Co. Kerry. It encompasses the sea cliffs from just west of Ballyheigue, around the end of Kerry Head to the west and north-eastwards as far as Kilmore. The site includes the sea cliffs and land adjacent to the cliff edge. The high-water mark forms the seaward boundary. The site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Chough and Fulmar. The site supports an internationally important population of breeding Chough, a Red Data Book species that is listed on Annex I of the EU Birds Directive. Thirty-two breeding pairs were recorded from the site during a survey in 1992 and 30 in a survey in 2002/2003. In addition, a flock of 20 birds was noted on the northern coast of the site during the latter survey. The site is of particular note for the density of breeding pairs found. The site also supports a nationally important population of Fulmar (421 pairs), as well as a small population of Shag (8 pairs) (date is from a survey in 2000). The site is also used by Peregrine (2 pairs in 2002). Kerry Head SPA is one of the most important sites in the country for Chough. It also supports a population of Fulmar of national importance. The presence of Chough and Peregrine, both species that are listed on Annex I of the EU Birds Directive, is of particular significance.
Magharee Islands SPA	The Magharee Islands lie about 2 km north of the Magharees Peninsula on the north side of the Dingle Peninsula, Co. Kerry. The site includes the main Magharee Islands (“Seven Hogs”), the islands of Mucklaghmore and Illaunnabarnagh to the east, Illaunnanoon and Doonagaun Island to the south and several smaller rocky islets. Illaunimmill and Illauntannig are the largest of the islands included in the site. This site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Barnacle Goose, Storm Petrel, Shag, Common Gull, Common Tern, Arctic Tern and Little Tern. The Magheree Islands are of national importance for breeding seabirds and also for wintering geese. In winter, the islands are utilised by a Barnacle Goose flock of national importance. The Magheree Islands are also an important site for breeding terns, which have been known to breed here since the 1850s. In 1995 I Little Tern population comprised over 20% of the national total. Sandwich Tern has bred in the past, for example in 1978, and a pair of Roseate Tern was also recorded breeding on Illaunnabarnagh in 2006.

SPA	Site description
	The site also supports nationally important populations of Storm Petrel, Shag and Common Gull. Other breeding seabirds recorded included Fulmar, Cormorant, Lesser Black-backed Gull, Herring Gull , Great Black-backed Gull, Shag, Common Gull, Common Tern, Arctic Tern and Little Tern. A possible breeding pair of Chough was recorded on the islands in 1992 and birds breeding on the mainland are known to forage on some of the islands. Magharee Islands SPA is of high ornithological importance for breeding seabirds, especially terns, as well as for wintering Barnacle Geese, which are at the most southerly point of their range in Europe. It is of note that six of the species that occur: Storm Petrel, Barnacle Goose, Chough, Common Tern, Arctic Tern and Little Tern are listed on Annex I of the EU Birds Directive.
Tralee Bay Complex SPA	The Tralee Bay Complex SPA is located along the coast of north Co. Kerry between Ballyheige in the north, Tralee in the east and Stradbally in the west. The site includes the inner part of Tralee Bay, including Derrymore Island, the inlets of Barrow Harbour and Carrahane Strand, Akeragh Lough, Lough Gill, and much of the intertidal habitat from Scraggane Point at the northern end of the Magharees Peninsula around the coast to c. 2 km south of Ballyheige. The site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Whooper Swan, Light-bellied Brent Goose, Shelduck, Wigeon, Teal, Mallard, Pintail, Scaup, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull and Common Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The EU Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Tralee Bay Complex SPA is an internationally important wetland for wintering waders and wildfowl. It supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further 21 species, i.e. Whooper Swan, Shelduck, Wigeon, Teal, Mallard, Pintail, Scaup, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull and Common Gull.
Dingle Peninsula SPA	The Dingle Peninsula SPA is a large site situated on the west coast of Co. Kerry. It encompasses the high coast and sea cliff sections of the peninsula from just south of Brandon Point in the north, around to the end of the peninsula at Slea Head, and as far east as Inch in the south. The site includes the sea cliffs, the land adjacent to the cliff edge, areas of sand dune on the Magharees Peninsula and near Murreagh, and also several upland areas further inland of the coast at

SPA	Site description
	Ballybrack, Lough Doon, Anascaul Lough, Arraglen and Ballynane. The high-water mark forms the seaward boundary. The site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Chough, Peregrine and Fulmar. The site supports some of the highest densities in Ireland of breeding Chough, a Red Data Book species that is listed on Annex I of the EU Birds Directive. The abundance of Chough on the Dingle Peninsula was first noted in the 1800s. When the first modern survey of Chough was undertaken in 1982 the species was seen to be abundant there. Since then the high importance of the site for Chough has been confirmed by surveys in 1992 and 2002/03 when 107 and 105 breeding pairs respectively were recorded within the SPA. The site also supports a nationally important population of Peregrine and Fulmar, as well as smaller populations of other breeding seabirds: Razorbill, Herring Gull, Lesser Black-backed Gull, Shag and Great Black-backed Gull all recorded from seabird survey data from 1999-2000. The site also holds a population of Black Guillemot. The Dingle Peninsula SPA is of ornithological importance as it supports an internationally important population of Chough. It also supports nationally important populations of Fulmar and Peregrine. The presence of Chough and Peregrine, both species that are listed on Annex I of the EU Birds Directive, is of particular significance. Part of the Dingle Peninsula SPA is a Statutory Nature Reserve.
Illaunonearaun SPA	Illaunonearaun is a small inaccessible island located approximately 300 m off the west Co. Clare coast, about 7 km south-west of Kilkee. It is a large flat-topped sea stack surrounded by high cliffs and a rocky shore. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Barnacle Goose. The island is regularly used in winter by a Barnacle Goose flock. Flock size varies as birds move between here and Mutton Island to the north; up to 200 birds have been recorded (as, for example, in spring 1988), but numbers are usually less than this, such as in 1994 (22 birds) and 1998 (142 birds). The island is an important breeding site for seabirds. A Cormorant colony was established in the 1970s and 60 individuals were recorded in 1995. Other species which breed include Fulmar, Great Black-backed Gull, Lesser Black-backed Gull and Herring Gull.
Mid-Clare Coast SPA	The Mid-Clare Coast SPA site extends along the Co. Clare coastline in a south-southwesterly direction from Spanish Point (3 km west of Milltown Malbay) to just west of Doonbeg Bay, a distance of some 14 km. It comprises the mainland shoreline, Mutton Island and Mattle Island, a series of rocky reefs and the open marine water of Mal Bay between the islands and the mainland. Mattle Island supports a nationally important breeding colony of Cormorant. Both Mutton

SPA	Site description
	Island and Mattle Island have breeding Shag,. Both islands have nesting Herring Gull and Great Black-backed Gull, while Mutton Island has Lesser Black-backed Gull and Common Gull. Black Guillemot breeds, at least on Mutton Island. Storm Petrel has long been known to breed on Mutton Island, though there has never been a quantitative estimate of the population size. A nationally important population of Barnacle Goose winters on Mutton Island, with birds occasionally visiting Mattle Island and feeding sites on the mainland. Mutton Island provides both feeding and roosting sites for the species. The mainland shore is important for wintering waders, especially the internationally important population of Purple Sandpiper and nationally important populations of Ringed Plover, Dunlin, Sanderling and Turnstone. Other species which occur in winter include Golden Plover, Grey Plover, Oystercatcher, Lapwing, Curlew and Redshank. Some of the waders may commute to the islands. The shallow seas are frequented by both Great Northern Diver and Red-throated Diver.
Blasket Islands SPA	The Blasket Islands are situated at the end of the Dingle peninsula in Co. Kerry. The site comprises all of the main islands in the group, as well as the various islets and rocks, and also the seas which surround the islands to a distance of 500 m. There are six main islands, plus some smaller islands, islets and sea stacks. The largest island, Great Blasket, is separated from the mainland by the Blasket Sound, a distance of some 2 km. The smallest island, Beginish, lies close to Great Blasket, while the other islands (Inishtooskert, Inishnabro, Inishvickillane, Tearaght Island) are between about 7 km and 12 km from the mainland. Apart from the low-lying Beginish near the mainland, all of the main islands rise to substantial heights, as follows: Great Blasket 292 m, Inishtooskert 162 m, Inishnabro 175 m, Inishvickillane 138 m and Tearaght 184 m. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Fulmar, Manx Shearwater, Storm Petrel, Shag, Lesser Black-backed Gull, Herring Gull, Kittiwake, Arctic Tern, Razorbill, Puffin and Chough. The site is also of special conservation interest for holding an assemblage of over 20,000 breeding seabirds. The Blasket Islands SPA is one of the most important seabird colonies in the country, with at least 11 species of seabird breeding regularly. It is the most important site in the country for Storm Petrel and Manx Shearwater, with internationally important populations of both. Nationally important populations of Fulmar, Lesser Black-backed Gull, Herring Gull, Kittiwake, Puffin and Shag also occur. Guillemot also breeds though in relatively low numbers. A nationally important population of Arctic Tern also breeds within the site. The islands are traditional sites for Peregrine and Chough. Further breeding species typical of western islands include Oystercatcher, Rock Dove, Wheatear, Raven and possibly Twite.

5 Appropriate Assessment Stage 1 Screening

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

i. Whether a plan or project is directly connected to or necessary for the management of the site, and
ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

As the site investigation activities investigations are not directly connected with or necessary to the management of a Natura 2000 site Stage 1 screening is therefore required to assess whether the said project is likely to have a significant effect on any Natura 2000 site.

5.1 Criteria for Natura 2000 site selection for screening

Selection follows guidance from the Office of the Planning Regulator Practice Note PN01 which recommends that the distance should be evaluated on a case-by-case basis and that the precautionary principle should be adopted.

As the site investigation activities are entirely marine based, with all survey activity located in the marine environment, there is therefore no possible direct interaction and no pressure pathway on terrestrial or freshwater SAC's that have no coastal habitat and no mobile species with a marine element. Therefore, such sites have not been considered further in this screening exercise unless they are co-located with an SPA that has been included for screening assessment and the SAC includes habitats that support the SPA and its QIs.

Criteria for Natura 2000 site selection for screening is as follows:

- Include any Natura 2000 site within or adjacent to the Foreshore Licence Application Area and which may be impacted by the proposed activities given the nature of the activities.
- Include any Natura 2000 site within the likely zone of influence of the Foreshore Licence Application Area, following Source-Pathway-Receptor model. N.B See note above regarding terrestrial and freshwater sites with no marine element.
- Include any Natura 2000 sites that contain mobile receptors, specifically marine mammals and migratory fish species that have the potential to occur within the Foreshore Licence Application Area and be impacted by the site investigation activities (Table 4-2 for migratory fish and marine mammals).
- Include any Natura 2000 site which falls within the same management unit for bottlenose dolphins and/or harbour porpoises as the Project Foreshore Licence Application Area.

5.1.1 Zone of Influence Bird Species

The European sites for the designation of bird species, considered in this report were selected on the basis of Source-Pathway-Receptor model.

5.1.1.1 Waterbirds

Physical disturbance of waterbird flocks by vessel traffic is possible, however this is very much dependant on the distance from the survey vessel at which flushing of birds could take place, which is species dependent, and can differ between individual birds and flocks with individual birds generally being disturbed at greater distances (Fliessbach *et al*, 2019). The study as described in Fliessbach *et al* (2019) showed that for overwintering species relevant to the Foreshore Licence Application Area, the great cormorant has the greatest escape distance with a max escape distance of 1500 m for individual birds. Other species relevant to this report include the common guillemot with a max escape distance of 500 m for individual birds and the black headed gull with a max of 250 m for individual birds. The OECC Area overlaps with River Shannon and River Fergus Estuaries SPA which lists as its QIs a number of overwintering waterbirds, of these shelduck and brent goose are considered sensitive to disturbance; the remainder show moderate or low sensitivity to disturbance (Cutts *et al*, 2013). Nevertheless the disturbance of waterbirds during the site investigation activities will be temporary in nature and limited in spatial extent, and feeding birds will have the opportunity to move away to alternative feeding grounds within the area. Given the distance between the Foreshore Licence Application Area and the other SPAs set out in Table 4-7 as well as the coastal nature of the foraging activities of waterbirds, potential for interaction between these birds and the survey activities is considered to be limited and temporary in duration.

5.1.1.2 Seabirds

Data on foraging movements of a number of seabird species has increased over the years mainly due to technological data capture systems such as satellite and other tracking technologies (e.g. Langston *et al*. 2013, Wakefield *et al*. 2015, 2017, Thaxter *et al*. 2014, 2018, Cleasby *et al*. 2015, 2020, Bogdanova *et al*. 2017, Carter *et al*. 2016, EPA *et al*. 2016, Votier *et al*. 2017). Available information on foraging areas used by species from particular colonies is still limited. However, Thaxter *et al*. (2012) and later Woodward *et al*. (2019) reported on representative breeding season foraging ranges for a range of species, giving Woodward *et al*. (2019) higher confidence in presented data.

Table 5-1 provides indicative foraging ranges (mean maximum) travelled for a range of seabird species from a breeding colony to a foraging area, which have been used to identify relevant sites on the basis that related Qualifying Interests could interact with the Foreshore Licence Application Area during site investigation activities. The mean maximum foraging range values are used to address potential interaction with relevant SPAs; however bird density will not be continuous throughout this range. Other ways of representing foraging ranges (e.g. the mean, or percentage foraging area derived from kernel analyses) may therefore provide more useful information, where available.

Whilst applying mean maximum foraging radius would encompass the majority of a population's home-range area, the overall size of the predicted foraging areas around the colony would potentially

make it too large to be a useful management tool, without further refinement using habitat and bathymetric data (Soanes *et al*. 2016). Similarly, the assumption that seabirds are uniformly distributed out to some threshold distance from their colonies, such as their putative maximum foraging range, is unrealistic. Seabird density declines with distance from the colony with density-dependent competition, coastal morphology and habitat preferences (Wakefield *et al*. 2017), for example oceanographic features at which seabirds preferentially forage including shelf-edge fronts, upwelling and tidal-mixing fronts, offshore banks and internal waves, regions of stratification, and topographically complex coastal areas subject to strong tidal flow (Cox *et al*. 2018), resulting in highly non-uniform distributions. While Critchley *et al*. (2018) used a distance-weighted foraging radius approach to project distributions at sea for a wide range of seabird species during the breeding season, the authors recognised the limitations of not considering environmental variables that contribute to such non-uniform distributions noted above.

The selection of all sites outlined in Appendix I within the mean maximum foraging range of the Foreshore Licence Application Area is a useful but simplistic approach to identifying relevant sites. The approach taken here has to be to review the initial selection of sites on this basis and exclude those for which an interaction would be unrealistic for example: sites where fulmar is identified as a Qualifying Interest on the far north and west of Ireland. Fulmar is a highly pelagic seabird and is highly unlikely to move large distances over land which could bring them to within the Foreshore Licence Application Area. The potential mean maximum foraging range for this species has therefore been applied across the marine area, including where birds could move around headlands.

Table 5-1 Indicative breeding season foraging ranges (Woodward *et al*, 2019)

Indicative breeding season foraging ranges			
Species	Mean maximum[1] (km ± SD)		Confidence Level (Woodward *et al*. 2019)[2]
	Thaxter *et al*. (2012)	Woodward *et al*. (2019)	
Eider	80	21.5	Poor
Red-throated diver	9	9	Low
Fulmar	400 ± 245.8	542.3 ± 657.9	Good
Manx shearwater	18.3 ± 12.5 & >330	1,346.8 ±,1,018.7	Moderate
European storm petrel	n/a	336	Poor
Leach's storm petrel	91.7 ± 27.5	n/a	Moderate
Gannet	229.4 ± 124.3	315.2 ± 194.2	Highest
Cormorant	25 ± 10	25.6 ± 8.3	Moderate
Shag	14.5 ± 3.5	13.2 ± 10.5	Highest
Arctic skua	62.5 ± 17.2	n/a	Poor
Great skua	10.9 ± 3.0 & 86.4	443.3 ± 487.9	Uncertain
Black-headed gull	25.5 ± 20.5	18.5	Uncertain
Common gull	50	50	Poor
Mediterranean gull	20	20	Uncertain
Herring gull	61.1 ± 44	58.8 ± 26.8	Good
Lesser black-backed gull	141.0 ± 50.8	127 ± 109	Highest
Kittiwake	60.0 ± 23.3	156.1 ± 144.5	Good

Indicative breeding season foraging ranges			
Species	Mean maximum[1] (km ± SD)		Confidence Level (Woodward *et al*. 2019)[2]
	Thaxter *et al*. (2012)	Woodward *et al*. (2019)	
Sandwich tern	49.0 ± 7.1	34.3 ± 23.2	Moderate
Roseate tern	16.6 ± 11.6	12.6 ± 10.6	Moderate
Common tern	15.2 ± 11.2	18.0 ± 8.9	Good
Arctic tern	24.2 ± 6.3	25.7 ± 14.8	Good
Little tern	6.3 ± 2.4	5	Moderate
Guillemot	84.2 ± 50.1	73.2 ± 80.5	Highest
Razorbill	48.5 ± 35.0	88.7 ± 75.9	Good
Puffin	105.4 ± 46.0	137.1 ± 128.3	Good

[1]The maximum range reported in each study averaged across studies.

[2] Confidence levels were assigned as follows: highest (based on >5 direct studies, graphs and standard deviation suggest relatively low variability between sites and hence higher confidence); good (based on >5 direct studies; graphs and standard deviation show wider variability between sites, hence lower confidence); moderate (between 2-5 direct studies); low (indirect measures or only one direct tracking study); uncertain (survey-based estimates); poor (few survey estimates or speculative data available).

5.1.2 Zone of Influence Annex I Habitats

As stated in Section 4.2.1, due to the very temporary and localised effects of the site investigation activities, the nature of proposed site investigation activities which have only very localised and temporary effects on their receiving environment, only Special Areas of Conservation that overlap the Foreshore Licence Application Area and have Annex I Habitats that could be affected by the proposed site investigation activities are considered relevant for assessment of effects on their QI Annex I Habitats in the context of the relevant conservation objectives. The Foreshore Licence Application Area overlaps with Lower River Shannon SAC which is therefore included in Stage 1 Screening. No other SACs designated for benthic habitats are included in the Stage 1 Screening in terms of their benthic habitats as no link exists between the proposed activities and the European site under the Source-Pathway-Receptor model.

5.1.3 Zone of Influence Mobile Annex II Marine or Partially Marine Species

SACs with marine (or partially marine) based mobile Qualifying Interests were considered within Irish management units (Irish Sea and Celtic Sea) taking into account foraging distances. Foraging distances and distribution of marine mammal species is discussed in Chapter 4. Taking into account the temporary and localised effects of the site investigation activities combined with the information included in Chapter 4 this approach is considered sufficient for the consideration of SACs with respect to their mobile Qualifying Interests with a marine presence. Individual animals from further away may also forage within the site however the effects of the surveys are so temporary and localised that it is very unlikely that populations of animals further away would be affected by the site investigation activities.

5.2 Identification of Relevant Natura 2000 Sites and Qualifying Interests/Special Conservation Interests

The Natura 2000 sites considered for the AA screening are listed in Table 5-1. Qualifying Interests and Special Conservation Interests listed in Table 5-1 are based on the most up-to-date data available and is sourced from National Parks and Wildlife website (www.NPWS.ie).

In total 63 Natura 2000 sites were deemed relevant and screened in for Appropriate Assessment Stage One Screening. These include 17 Natura 2000 sites in the vicinity of the Project Foreshore Licence Application Area:

- River Shannon and River Fergus Estuaries SPA
- Loop Head SPA
- Tralee Bay Complex SPA
- Kerry Head SPA
- Magharee Islands SPA
- Dingle Peninsula SPA
- Illaunonearaun SPA
- Mid-Clare Coast SPA
- Blasket Islands SPA
- Lower River Shannon SAC
- Kerry Head Shoal SAC
- Magharee Islands SAC
- Tralee Bay and Magharees Peninsula, West to Cloghane SAC
- Kilkee Reefs SAC
- Mount Brandon SAC
- Akeragh, Banna and Barrow Harbour SAC
- Carrowmore Dunes SAC

Within the potential influence of the site there are 46 additional coastal or marine Special Areas of Conservation which have mobile qualifying interests found in the marine environment and may be impacted by the site investigation activities (e.g. migrating fish species, seals, otters, porpoises and dolphins):

- Blasket Islands SAC
- Castlemaine Harbour SAC
- Blackwater River (Kerry) SAC
- Slyne Head Islands SAC
- Connemara Bog Complex SAC
- Slyne Head Peninsula SAC
- West Connacht Coast SAC
- Lough Corrib SAC
- Maumturk Mountains SAC

- The Twelve Bens/Garraun Complex SAC
- Inishbofin and Inishshark SAC
- Roaringwater Bay and Islands SAC
- Mweelrea/Sheeffry/Erriff Complex SAC
- Duvillaun Islands SAC
- Inishkea Islands SAC
- Newport River SAC
- Owenduff/Nephin Complex SAC
- Glenamoy Bog Complex SAC
- River Moy SAC
- Blackwater River (Cork/Waterford) SAC
- Unshin River SAC
- River Barrow and River Nore SAC
- Saltee Islands SAC
- Lower River Suir SAC
- Rockabill to Dalkey Island SAC
- West Wales Marine
- Bristol Channel Approaches
- North Anglesey Marine
- North Channel
- Mers Celtiques - Talus du Golfe de Gascogne
- Nord Bretagne DH
- Ouessant-Molène
- Abers - Côte des Legendes
- Chaussée de Sein
- Côte de Granit Rose-Sept-Iles
- Baie de Morlaix
- Tregor Goëlo
- Cap d'Erquy - Cap Fréhel
- Baie de Saint-Brieuc - Est
- Récifs et Landes de la Hague
- Anse de Vauville
- Banc et Récifs de Surtainville
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard
- Chausey
- Estuaire de la Rance
- Baie du Mont Saint-Michel

5.3 Assessment Table

Table 5-2: Identification and screening of relevant Natura 2000 sites within the Zone of Influence of the Foreshore Licence Application Area.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
River Shannon and River Fergus Estuaries SPA (004077)(2015a)	Cormorant (*Phalacrocorax carbo)* [A017] Whooper Swan (*Cygnus cygnus*) [A038] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Scaup (*Aythya marila*) [A062] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Knot (*Calidris canutus*) [A143] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157]	Overlaps	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. Breeding birds are habituated to vessel movements and are subject to multiple vessel movements every day. Therefore the breeding bird species (SCI) of the SPA are unlikely to be disturbed by the site investigation activities. No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Greenshank (*Tringa nebularia*) [A164] Black-headed Gull (*Chroicocephalus ridibundus)* [A179]			
	Wetland and Waterbirds		Intertidal substrate will be disturbed in the immediate vicinity of geotechnical survey.	Direct effects will be temporary only and will not affect the spatial extent of the wetlands area. No likely significant effect.
Loop Head SPA (004119)(2009a)	Kittiwake (*Rissa tridactyla*) [A188] Guillemot (*Uria aalge*) [A199]	0.80	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. Breeding birds are habituated to vessel movements and are subject to multiple vessel movements every day. Therefore the breeding bird species (SCI) of the SPA are unlikely to be disturbed by the site investigation activities.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
				No likely significant effect.
Kerry Head SPA (004189)(2015b)	Fulmar (*Fulmarus glacialis*) [A009] Chough (*Pyrrhocorax pyrrhocorax*) [A346]	1.13	Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. Breeding birds are habituated to vessel movements and are subject to multiple vessel movements every day. Therefore the breeding bird species (SCI) of the SPA are unlikely to be disturbed by the site investigation activities. No likely significant effect.
Magharee Islands SPA (004125)(2014f)	Storm Petrel (*Hydrobates pelagicus*) [A014] Shag (*Phalacrocorax aristotelis*) [A018] Barnacle Goose (*Branta leucopsis*) [A045] Common Gull (*Larus canus*) [A182] Common Tern (*Sterna hirundo*) [A193]	4.44	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Arctic Tern (*Sterna paradisaea*) [A194] Little Tern (*Sterna albifrons*) [A195]			temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. In addition it lies outside of the disturbance range for breeding seabirds (2km – JNCC, 2017). No likely significant effect.
Tralee Bay Complex SPA (004188)(2015c)	Whooper Swan (*Cygnus cygnus*) [A038] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Mallard (*Anas platyrhynchos*) [A053] Pintail (*Anas acuta*) [A054] Scaup (*Aythya marila*) [A062] Oystercatcher (*Haematopus ostralegus*) [A130] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria)* [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142]	7.61	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa)* [A156] Bar-tailed Godwit (*Limosa lapponica)* [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182]			
	Wetland and Waterbirds [A999]		None	No pathway identified No likely significant effect.
Dingle Peninsula SPA (004153)(2014g)	Fulmar (*Fulmarus glacialis*) [A009] Peregrine (*Falco peregrinus*) [A103] Chough (*Pyrrhocorax pyrrhocorax*) [A346]	8.68	Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
				In addition it lies outside of the disturbance range for breeding seabirds (2km – JNCC, 2017). No likely significant effect.
Illaunonearaun SPA (004114)(2014c)	Barnacle Goose (*Branta leucopsis*) [A045]	8.68	Visual and noise disturbance	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. No likely significant effect.
Mid-Clare Coast SPA (004182)(2015d)	Cormorant (*Phalacrocorax carbo*) [A017] Barnacle Goose (*Branta leucopsis*) [A045] Ringed Plover (*Charadrius hiaticula*) [A137] Sanderling (*Calidris alba*) [A144] Purple Sandpiper (*Calidris maritima*) [A148] Dunlin (*Calidris alpina*) [A149]	14.22	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel should birds from this SPA be present within the Foreshore Licence Application Area however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Turnstone (*Arenaria interpres*) [A169]			and (2) are likely to quickly return to the area once the vessel has moved on. In addition it lies outside of the disturbance range for breeding seabirds (2km – JNCC, 2017). No likely significant effect.
	Wetland and Waterbirds [A999]		None	No pathway identified No likely significant effect.
Blasket islands SPA (004008) (2013c)	Fulmar (*Fulmarus glacialis*) [A009] Manx Shearwater (*Puffinus puffinus*) [A013] Storm Petrel (*Hydrobates pelagicus*) [A014] Shag (*Phalacrocorax aristotelis*) [A018] Lesser Black-backed Gull (*Larus fuscus*) [A183] Herring Gull (*Larus argentatus*) [A184] Kittiwake (*Rissa tridactyla*) [A188] Arctic Tern (*Sterna paradisaea*) [A194] Razorbill (*Alca torda*) [A200] Puffin (*Fratercula arctica*) [A204] Chough (*Pyrrhocorax pyrrhocorax*) [A346]	25.26	Disturbance from vibration and underwater noise associated with surveys Visual and noise disturbance Disturbance during breeding season	Site investigation activities may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to (1) more to alternative feeding grounds nearby and (2) are likely to quickly return to the area once the vessel has moved on. Breeding birds are habituated to vessel movements and are subject to multiple vessel movements every day. Therefore the breeding bird species (SCI) of the SPA are unlikely to be disturbed by the site investigation activities. No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Lower River Shannon SAC (002165) **(NPWS, 2013a)**	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Large shallow inlets and bays [1160] Reefs [1170]	Overlaps	Physical disturbance to marine benthic communities and sensitive habitats by: Habitat disturbance and smothering during all intrusive site investigation activities; Increased suspension of solids in water column; Vibration from geo-technical equipment; Sediment penetration and some substratum loss.	The qualifying interest Sandbanks; Estuaries; Large shallow inlets and bays; and Reefs are subject to direct impact from the geotechnical site investigation activities and benthic sampling. Likely Significant Effect

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *Margaritifera margaritifera* (Freshwater pearl mussel) [1029] *Lampetra planeri* (Brook lamprey) [1096]		None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Petromyzon marinus (Sea lamprey) [1095] *Lampetra fluviatilis* (River lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect.
	Tursiops truncatus (Common bottlenose dolphin) [1349]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
	Lutra lutra (Otter) [1355]		Visual and noise disturbance. Injury due to collision (survey vessels/sampling equipment).	There is a "commuting buffer" up to 250 metres from shore throughout the SAC designated for otter. Likely Significant Effect
Kerry Head Shoal SAC (002263) (NPWS, 2014a)	Reefs [1170]	0.04	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Magharee Islands SAC (002261) (NPWS, 2014e)	Reefs [1170]	4.28	None	No pathway of interaction No likely significant effect.
Tralee Bay and Magherees Peninsula, West to Cloghane SAC (002070) (NPWS, 2021a)	Estuaries [1130] 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 colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190]	6.78	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *Petalophyllum ralfsii* (Petalwort) [1395]			
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Kilkee Reefs SAC (002264) (NPWS, 2014b)	Large shallow inlets and bays [1160] Reefs [1170] Submerged or partially submerged sea caves [8330]	8.47	None	No pathway of interaction No likely significant effect.
Mount Brandon SAC (000375) (NPWS, 2016a)	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]	9.80	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] *Margaritifera margaritifera* (Freshwater pearl pussel) [1029] *Trichomanes speciosum* (Killarney fern) [1421]			
Akeragh, Banna and Barrow Harbour SAC (000332) (NPWS, 2013b)	Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110]	11.56	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] European dry heaths [4030]			
Carrowmore Dunes SAC (002250) (NPWS, 2014d)	Reefs [1170] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]	14.13	None	No pathway of interaction No likely significant effect.
Blasket Islands SAC (002172) (NPWS, 2013c)	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330]	22.89	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Phocoena phocoena (Harbour porpoise) [1351]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
	Halichoerus grypus (Grey seal) [1364]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
Castlemaine Harbour SAC (000353) (NPWS, 2015e)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Perennial vegetation f stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	26.649	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190] Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Petalophyllum ralfsii* (Petalwort) [1395]			
	Petromyzon marinus (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Blackwater River (Kerry) SAC (002173) (NPWS, 2014h)	European dry heaths [4030] *Geomalacus maculosus* (Kerry slug) [1024] *Margaritifera margaritifera* (Freshwater pearl mussel) [1029] *Rhinolophus hipposideros* (Lesser horseshoe bat) [1303]	52.61	None	No pathway of interaction No likely significant effect.
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
	Petromyzon marinus (Sea lamprey) [1095] *Lampetra fluviatilis* (River lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Slyne Head Islands SAC (000328) (NPWS, 2019a)	Reefs [1170]	91.40	None	No pathway of interaction No likely significant effect.
	Tursiops truncatus (Common bottlenose dolphin) [1349]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
	Halichoerus grypus (Grey seal) [1364]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
Connemara Bog Complex SAC (002034) (NPWS, 2015f)	Coastal lagoons [1150] Reefs [1170]	91.62	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-Nanojuncetea [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]			

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Euphydryas aurinia (Marsh fritillary) [1065] *Najas flexilis* (Slender naiad) [1833]			
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Slyne Head Peninsula SAC (002074) (NPWS, 2019b)	Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	92.11	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-Nanojuncetea [3130] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] European dry heaths [4030] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae)* [6410] Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] Alkaline fens [7230] *Petalophyllum ralfsii* (Petalwort) [1395]			

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Najas flexilis (Slender naiad) [1833]			
	Tursiops truncatus (Common bottlenose dolphin) [1349]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
West Connacht Coast SAC (002998) (NPWS, 2014i)	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	98.47	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Lough Corrib SAC (000297) (NPWS, 2015h)	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-Nanojuncetea [3130] Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	103.48	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Limestone pavements [8240] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Bog woodland [91D0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Lampetra planeri* (Brook Lamprey) [1096] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] N*ajas flexilis* (Slender Naiad) [1833] *Hamatocaulis vernicosus* (Slender Green Feather-moss) [6216]			
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Petromyzon marinus (Sea Lamprey) [1095] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
Maumturk Mountains SAC (002008) (NPWS, 2013f)	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Northern Atlantic wet heaths with *Erica tetralix* [4010] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous rocky slopes with chasmophytic vegetation [8220] *Najas flexilis* (Slender Naiad) [1833	110.52	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
The Twelve Bens/Garraun Complex SAC (002031) (NPWS, 2015g)	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210]	111.56	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Siliceous rocky slopes with chasmophytic vegetation [8220] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Najas flexilis* (Slender Naiad) [1833]			
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Inishbofin and Inishshark SAC (000278) (NPWS, 2013e)	Coastal lagoons [1150] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]	114.99	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030]			
	Halichoerus grypus (Grey Seal) [1364]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise Likely Significant Effect
Roaringwater Bay and Islands (000101) (NPWS, 2014j)	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]	136.61	None	No pathway of interaction No likely significant effect.
	Lutra lutra (Otter) [1355*]*		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
	Halichoerus grypus (Grey Seal) [1364]		Disturbance from vibration and underwater noise associated	Mobile species so has potential to pass through Foreshore Licence Application Area

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	and is sensitive to disturbance from underwater noise Likely Significant Effect
	Phocoena phocoena (Harbour Porpoise) [1351]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise Likely Significant Effect
Mweelrea/Sheeffry/Erriff Complex SAC (001932) (NPWS, 2021b)	Coastal lagoons [1150] Annual vegetation of drift lines [1210] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Machairs (* in Ireland) [21A0]	137.29	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-Nanojuncetea [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150]			

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani)* [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] *Vertigo geyeri* (Geyer's Whorl Snail) [1013] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833]			
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Duvillaun Islands SAC (000495) (NPWS, 2019c)	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364]	158.83	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise Likely Significant Effect
Inishkea Islands SAC (000507) (NPWS, 2013i)	Machairs (* in Ireland) [21A0] *Petalophyllum ralfsii* (Petalwort) [1395]	170.79	None	No pathway for interaction No likely significant effect.
	Halichoerus grypus (Grey Seal) [1364]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
Newport River SAC (002144) (NPWS, 2013g)	*Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]	172.54	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
Owenduff/Nephin Complex SAC (000534) (NPWS, 2015i)	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] *Salicornia* and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)* [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Turloughs [3180] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous	188.99	None	No pathway of interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	substrates (Festuco-Brometalia) (* important orchid sites) [6210] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] Alkaline fens [7230] Limestone pavements [8240]			
	Phoca vitulina (Harbour Seal) [1365]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but generally stay close to haul out. The site investigation activities are not likely to effect harbour seals from this SAC. No likely Significant Effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Glenamoy Bog Complex SAC (000500) (NPWS, 2013k)	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Machairs (* in Ireland) [21A0] Natural dystrophic lakes and ponds [3160]	209.53	None	No pathway for interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Northern Atlantic wet heaths with *Erica tetralix* [4010] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] *Petalophyllum ralfsii* (Petalwort) [1395] *Saxifraga hirculus* (Marsh Saxifrage) [1528] *Hamatocaulis vernicosus* (Slender Green Feather-moss) [6216]			
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
River Moy SAC (002298) (NPWS, 2020a)	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	275.41	None	No pathway for interaction No likely significant effects.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Lampetra planeri* (Brook Lamprey) [1096]			
	Salmo salar (Salmon) [1106] *Petromyzon marinus* (Sea Lamprey) [1095]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range. No likely significant effect.
	Estuaries [1130]	284.33	None	No pathway of interaction

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Blackwater River (Cork/Waterford) (002170) (NPWS, 2016b)	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] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion*, Alnion incanae*, *Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Trichomanes speciosum* *Lampetra planeri* (Brook lamprey) [1096] *Trichomanes speciosum* (Killarney Fern) [1421]			No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Petromyzon marinus (Sea lamprey) [1095] *Lampetra fluviatilis* (River lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Alosa fallax fallax (Twaite shad) [1103]		Disturbance from vibration and underwater noise associated with site investigation activities.	Migratory and mobile species that is sensitive to sound pressure, water depths at site are within its known preference range so has potential to pass through the Foreshore Licence Application Area. Likely Significant Effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range No likely significant effect.
Unshin River SAC (001898) (NPWS, 2016d)	Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous	303.02	None	No pathway for interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae, Salicion albae*) [91E0]			
	Salmo salar (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range. No likely significant effect
River Barrow And River Nore SAC (002162) (NPWS, 2016c)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170]	345.57	None	No pathway for interaction therefore: No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] European dry heaths [4030] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Petrifying springs with tufa formation (Cratoneurion) [7220] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Margaritifera durrovensis* (Nore Pearl Mussel) [1990]			

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] Trichomanes speciosum (Killarney Fern) [1421] *Lampetra planeri* (Brook lamprey) [1096]			
	Petromyzon marinus (Sea lamprey) [1095] *Lampetra fluviatilis* (River lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Alosa fallax fallax (Twaite shad) [1103]		Disturbance from vibration and underwater noise associated with site investigation activities.	Migratory and mobile species that is sensitive to sound pressure, water depths at site are within its known preference range so has potential to pass through the Foreshore Licence Application Area. Likely Significant Effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	Mobile species but remains close to the coast and the site investigation activities are outside its range. No likely significant effect.
	Mudflats and sandflats not covered by seawater at low tide [1140]	353.90	None	No pathway for interaction

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
Saltee Islands (000707) (NPWS, 2013j)	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Submerged or partially submerged sea caves [8330]			No likely significant effect.
	Halichoerus grypus (Grey Seal) [1364]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
Lower River Suir (002137) (NPWS, 2013h)	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	360.60	None	No pathway for interaction No likely significant effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) [91E0] *Taxus baccata* woods of the British Isles [91J0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Lampetra planeri* (Brook lamprey) [1096]			
	Petromyzon marinus (Sea lamprey) [1095] *Lampetra fluviatilis* (River lamprey) [1099] *Salmo salar* (Salmon) [1106]		Disturbance from vibration and underwater noise associated with site investigation activities	Mobile species so have potential to pass through Foreshore Licence Application Area, however, these species are not sensitive to sound pressure therefore not likely to be affected by the site investigation activities. No likely significant effect
	Alosa fallax fallax (Twaite shad) [1103]		Disturbance from vibration and underwater noise associated with site investigation activities.	Migratory and mobile species that is sensitive to sound pressure, water depths at site are within its known preference range so has potential to pass through the Foreshore Licence Application Area. Likely Significant Effect
	Lutra lutra (Otter) [1355]		Disturbance from vibration and underwater noise associated	Mobile species but remains close to the coast and the site investigation activities are outside its range.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			with site investigation activities. Injury due to collision (survey vessels / sampling equipment).	No likely significant effect.
Rockabill to Dalkey Island SAC (003000) (NPWS, 2014k)	Reefs [1170]	504.86	None	No pathway for interaction No likely significant effect.
	Phocoena phocoena (Harbour Porpoise) [1351]		Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
West Wales Marine SAC / Gorllewin Cymru Forol (UK0030397)(JNCC, 2021d)	*Phocoena phocoena* (Harbour Porpoise) [1351]	419.39	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect
Bristol Channel Approaches (UK0030396)(JNCC, 2021a)	*Phocoena phocoena* (Harbour porpoise*) [1351]*	440.19	Disturbance from vibration and underwater noise associated with site investigation activities.	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			Injury due to collision (survey vessels/sampling equipment).	
North Anglesey Marine SAC (UK0030398)(NRW, 2016)	*Phocoena phocoena* (Harbour Porpoise) [1351]	531.38	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
North Channel SAC (UK0030399) (JNCC, 2021b)	*Phocoena phocoena* (Harbour Porpoise) [1351]	613.27	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Mers Celtiques - Talus du Golfe de Gascogne SAC (FR5302015) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	460.66	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Nord Bretagne DH SAC (FR2502022) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	570.94	Disturbance from vibration and underwater noise associated with site investigation activities.	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			Injury due to collision (survey vessels/sampling equipment).	Likely Significant Effect.
Oussant-Molene SAC (FR5300018) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	588.15	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Abers-Cotes des Legendes SAC (FR5300017) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	602.07	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Chaussée de Sein SAC (FR5300007) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	617.28	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Côte de Granit Rose-Sept-Iles SAC (FR5300009) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	632.89	Disturbance from vibration and underwater noise associated with site investigation activities.	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			Injury due to collision (survey vessels/sampling equipment).	Likely Significant Effect.
Baie de Morlaix SAC (FR5300015) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	634.22	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Tregor Goelo SAC (FR5310010) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	657.98	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Cap d'Erquy - Cap Frehel SAC (FR5300011) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	725.95	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Baie de Saint-Brieuc Est SAC (FR5300066) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	726.35	Disturbance from vibration and underwater noise associated with site investigation activities.	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			Injury due to collision (survey vessels/sampling equipment).	Likely Significant Effect.
Recifs et landes de la Hague SAC (FR2500084) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	726.46	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Anse de Vauville SAC (FR2502019) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	729.59	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Banc et Récifs de Surtainville SAC (FR2502018) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	732.58	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC (FR5300012) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	749.41	Disturbance from vibration and underwater noise associated with site investigation activities.	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise.

Site Name (Site Code)	Qualifying Interest	Distance to Site (Km)	Potential pressures pathways identified due to the site investigation activities proposed in the Foreshore Licence Application Area	Likelihood of interaction between QI and site investigation activities proposed in the Foreshore Licence Application Area
			Injury due to collision (survey vessels/sampling equipment).	Likely Significant Effect.
Chausey SAC (FR2500079) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	755.70	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Estuaire de la Rance SAC (FR5300061) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	766.30	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.
Baie du Mont Saint-Michel SAC (FR2500077) (INPN, 2022)	*Phocoena phocoena* (Harbour Porpoise) [1351]	774.22	Disturbance from vibration and underwater noise associated with site investigation activities. Injury due to collision (survey vessels/sampling equipment).	Mobile species so has potential to pass through Foreshore Licence Application Area and is sensitive to disturbance from underwater noise. Likely Significant Effect.

5.4 Screening Assessment of Likely Significant Effect

5.4.1 Direct Effects – Physical Disturbance to Marine Benthic Communitities; Habitat Loss

The General Conservation Objectives with regards to designated habitats of the Special Areas of Conservation considered in this report are set out in Table 5-2 below and are adapted from NPWS literature.

Table 5-3: Adapted from General Conservation Objectives for Special Areas of Conservation (NPWS (2019) The Status of EU Protected Habitats and Species in Ireland).

General Conservation Objectives for Annex I Habitats	
To maintain or restore favourable conservation status of habitats, which is defined by the following list of attributes and targets:	
Attribute	**Target**
Habitat area and distribution	its natural range, and area it covers within that range, are stable or increasing
Habitat Structure	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
Designated Species	the conservation status of its typical species is favourable (achieved through maintaining or improving population dynamics, natural range and sufficient availability of habitat to support population size
Future Prospects	The targets for both are likely to continue to be met into the future

As stated in Section 4.2.1, due to the very temporary and localised effects of the site investigation activities and the nature of the proposed site investigation activities which have only very localised and temporary effects on their receiving environment, only Special Areas of Conservation that overlap the Foreshore Licence Application Area and have Annex I Habitats that could be affected by the proposed site investigation activities would be relevant for assessment of effects on their QI Annex I Habitats.

The Foreshore Licence Application Area overlaps with one SAC designated for Annex I Habitats:

- Lower River Shannon SAC

Lower River Shannon SAC is designated for four Annex I Habitats: *Sandbanks which are slightly covered by sea water all the time* [1110], *Estuaries* [1130], *Large shallow inlets and bays* [1160], and *Reefs* [1170] which have the potential to be physically disturbed by the geotechnical survey and likely significant effects cannot be ruled out at the screening stage in the absence of mitigation measures; Lower River Shannon SAC is therefore screened in for further assessment.

Since the Foreshore Licence Application Area does not overlap with any other Special Areas of Conservation no link exists between the proposed activities and any other Special Area of

Conservation under the Source-Pathway-Receptor model that could affect the conservation objectives of the Annex I Habitats within any SACs for which no overlap exists, therefore no further sites were considered purely on the basis of Qualifying Interest Annex I Habitats.

Therefore, likely significant effects upon the conservation objectives of the following sites can be excluded at this stage in the absence of mitigation measures and the following sites can be screened out for Stage 2 Appropriate Assessment (AA):

- Kerry Head Shoal SAC
- Magharee Islands SAC
- Tralee Bay and Magharees Peninsula, West to Cloghane SAC
- Kilkee Reefs SAC
- Mount Brandon SAC
- Akeragh, Banna and Barrow Harbour SAC
- Carrowmore Dunes SAC

5.4.2 Disturbance from vibration and underwater noise associated with surveys

5.3.2.1 Annex II Species

The following SACs have been screened into the AA as they have designated mobile species that may enter the Foreshore Licence Application Area and are potentially sensitive to the activities of the surveys:

- Lower River Shannon SAC
- Blasket Islands SAC
- Slyne Head Islands SAC
- Slyne Head Peninsula SAC
- West Connacht Coast SAC
- Inishbofin and Inishshark SAC
- Roaringwater Bay and Islands SAC
- Duvillaun Islands SAC
- Inishkea Islands SAC
- Blackwater River (Cork/Waterford) SAC
- Saltee Islands SAC
- Lower River Suir SAC
- Rockabill to Dalkey Island SAC
- West Wales Marine
- Bristol Channel Approaches
- North Anglesey Marine
- North Channel
- Mers Celtiques - Talus du Golfe de Gascogne
- Nord Bretagne DH
- Ouessant-Molène

- Abers - Côte des Legendes
- Chaussée de Sein
- Côte de Granit Rose-Sept-Iles
- Baie de Morlaix
- Tregor Goëlo
- Cap d'Erquy - Cap Fréhel
- Baie de Saint-Brieuc - Est
- Récifs et Landes de la Hague
- Anse de Vauville
- Banc et Récifs de Surtainville
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard
- Chausey
- Estuaire de la Rance
- Baie du Mont Saint-Michel

The following SACs have been screened out of the AA on the basis that the Foreshore Licence Application Area is beyond the range of their designated Annex II species, or that the species are not sensitive to the activities of the site surveys:

- Blackwater River (Kerry) SAC
- Castlemaine Harbour SAC
- Connemara Bog Complex SAC
- Lough Corrib SAC
- Maumturk Mountains SAC
- The Twelve Bens/Garraun Complex SAC
- Mweelrea/Sheeffry/Erriff Complex SAC
- Newport River SAC
- Owenduff/Nephin Complex SAC
- Glenamoy Bog Complex SAC
- River Moy SAC
- River Barrow and River Nore SAC
- Unshin River SAC

Table 5-4 Appropriate Assessment Screening Summary by Species for Mobile Marine Mammals and Migratory Fish Species

Species	Species Information
Sea and river lamprey	Sea and river lamprey are capable of hearing shipping and drilling noise associated with the site investigations (Mickle *et al*., 2009) and are anadromous fish species with a migratory phase in the sea. However, they are not considered to be hearing specialists (Popper *et al*., 2003, 2004) and are not vulnerable to the sounds emitted by the survey activities; they are therefore screened out. The salmon, while capable of hearing noise in the lower frequency range below 380Hz (Hawkins & Johnstone, 1978) is also considered to be a hearing non-specialist with low sensitivity to sound in water and can also be screened out.

Species	Species Information
Twaite shad	Twaite shad is a listed Annex II species for the following SACs: Blackwater River (Cork/Waterford) SAC and Lower River Suir SAC. Clupeids of the shad family (Alosinae) have shown sensitivity to a range of frequencies that can extend to >100 kHz. Therefore as likely significant effects cannot be ruled out for twaite shad in the absence of mitigation measures the species and their designated SACs are screened in for Stage 2 Appropriate Assessment.
Harbour porpoise	Harbour porpoise is one of two cetacean species with designated SACs considered within this Appropriate Assessment Screening. They utilise in-water acoustics for communication and echolocation and are sensitive to the noise generated by the site investigation activities (Richardson *et al*., 1995). Porpoises are "high-frequency" cetaceans sensitive to noise in the 200Hz – 180kHz range (Southall *et al*., 2007). The greatest potential impact on this species from the proposed site investigation activities would be from noise generated by SBP and HESS. This activity has the potential to be within the hearing threshold of harbour porpoise. This species is a mobile species which may be found within the Foreshore Licence Application Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures. This species and the relevant SACs are screened in for Stage 2 Appropriate Assessment. The SACs considered in this report are Blasket Islands SAC, Roaringwater Bay and Islands SAC, Rockabill to Dalkey Island SAC, West Wales Marine SAC, North Anglesey Marine SAC, Bristol Channel Approaches SAC, North Channel SAC, Mers Celtiques - Talus du Golfe de Gascogne SAC, Nord Bretagne DH SAC, Ouessant-Molène SAC, Abers - Côte des Legendes SAC, Chaussée de Sein SAC, Côte de Granit Rose-Sept-Iles SAC, Baie de Morlaix SAC, Tregor Goëlo SAC, Cap d'Erquy - Cap Fréhel SAC, Baie de Saint-Brieuc Est SAC, Récifs et landes de la Hague SAC, Anse de Vauville SAC, Banc et Récifs de Surtainville SAC, Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC, Chausey SAC, Estuaire de la Rance SAC, Baie du Mont Saint-Michel SAC, all of which are in the Celtic and Irish Seas Management Unit for harbour porpoise.
Bottlenose dolphin	Bottlenose dolphin is one of two cetacean species with designated SACs considered within this Appropriate Assessment Screening exercise. They utilise in-water acoustics for communication and echolocation and are sensitive to the noise generated by the site investigation activities (Richardson *et al*., 1995). Bottlenose dolphins hear in the mid frequency range (150 - 160,000 Hz) (DAHG, 2014). The greatest impact on this species from the proposed site investigation activities would be noise from generated by SBP and HESS. This activity has the potential to be within the hearing threshold of bottlenose dolphins. This species is a mobile species which may be found within the Foreshore Licence Application Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures, therefore this species and the relevant SACs are screened in for Stage 2 Appropriate Assessment. The SACs considered in this report coincide with the West Coast of Ireland Management Unit for bottlenose dolphin: Lower River

Species	Species Information
	Shannon SAC, Slyne Head Islands SAC, Slyne Head Peninsula SAC, West Connacht Coast SAC, and Duvillaun Islands SAC.
Grey seal and common seal	These two pinniped species are listed as protected Annex II species for SACs assessed in this Appropriate Assessment Screening. Both seal species can hear sound in water at low frequencies relative to cetaceans (75Hz – 75kHz) (Southall *et al*., 2007) and would be sensitive to the noise from the survey equipment and vessels. There are seven SACs with grey seals as Qualifying Interests assessed in this AA Screening: Blasket Islands SAC, Slyne Head Islands SAC, Roaringwater Bay and Islands SAC, Inishbofin and Inishshark SAC, Duvillaun Islands SAC, Inishkea Islands SAC, and Saltee Islands SAC. No SACs designated for common seals were screened in for assessment in this document. Grey seal are mobile species with the potential to be present within the Foreshore Licence Application Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures, therefore this species and the relevant SACs are screened in for Stage 2 Appropriate Assessment.
Otter	This is a mobile species that in coastal habitats tends to remain close to shore. (range approximately 12km along the coast and 80m seaward from the coast). One SAC, Lower River Shannon, is designated for otter and falls inside this range. There is a designated "commuting buffer" of 250m from the shore in the SAC, and therefore there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures, therefore this species and the relevant SACs are screened in for Stage 2 Appropriate Assessment.

5.3.2.2 Birds

Appendix II to this report shows the Special Protection Areas for which the Foreshore Licence Application Area falls within the mean max foraging range (Thaxter *et al*, 2018) of Species of Conservation Interest that may be sensitive to underwater noise generated by geophysical survey activities. However, potential for the underwater noise generated from the proposed site investigation activities under this application has been examined in Section 3. While acknowledging that there is limited information in relation to the effects of underwater noise on diving bird species, there is no record of any effects on diving bird species as a result of underwater noise generated by site investigation activities for offshore wind data gathering purposes. The limited research undertaken has been in relation to 3D seismic surveys used for oil and gas purposes which is many times greater in intensity when compared to the proposed site investigation activities under this application. That research did not show any increase in mortality during the period monitored in relation to the activity. Therefore, it was concluded that given the scale and nature of the proposed activities noise is not identified as an impact pathway that could affect the conservation objectives of the sites as listed in Appendix II to this report.

5.4.3 Visual and Noise Disturbance to Birds

Table 4-4 and Appendix II to this report show the individual sites and their relevant Qualifying Interests that may be linked to the sources of potentially significant effect from the proposed site investigation activities.

The physical presence of the survey vessel/vessels may cause some temporary disturbance to birds in the vicinity of the survey. This may result in birds being temporarily displaced from their chosen feeding/resting location; however, they are likely to move to another nearby location. The presence of 1-2 extra vessels in the area is not deemed a significant increase in vessel activity given the typical levels of activity in the area.

The temporary nature and imperceptible effects of the survey activities are not likely to have a significant effect on the prey species of the Qualifying Interests of the SPAs, therefore, it is considered not likely that bird species will be indirectly affected as a result of an effect on their fish prey species.

The physical presence of survey vessels may result in temporary disturbance to individual birds present in the vicinity of the Foreshore Licence Application Area. However the SPAs considered encompass significantly large areas and considering their composition birds will be able to easily move to alternative feeding grounds nearby. This combined with the nature of the surveys which are very short in duration and of very localised affects in any one location mean that the site investigation activities are unlikely to have a significant effect on bird species directly or indirectly for any of the SPAs considered in this report.

Site investigation activities which occur within the 2km range of disturbance for breeding seabirds (JNCC, 2017) may cause temporary displacement from chosen feeding grounds in the immediate vicinity of the survey vessel, however the effect will be very localised and temporary in nature and temporarily displaced birds will be able to move to alternative feeding grounds nearby and are likely to quickly return to the area once the vessel has moved on. In addition the birds of the SPAs in the vicinity of the Foreshore Licence Application Area are well habituated to vessel traffic, situated as they are in the Shannon Estuary.

It is considered unlikely that bird species of the below listed SPAs will be affected either directly or indirectly by the site investigation activities within the Foreshore Licence Application Area and they can therefore be screened out of further consideration.

Therefore, the SPA sites listed in Table 4-4 and Appendix II are screened out for Stage 2 Appropriate Assessment (AA).

In conclusion, it is deemed that the site investigation activities will not impact on bird species, directly or indirectly, due to the nature of the surveys, their very short duration, and limited emissions. It is considered not likely that there will be any significant effects either directly or indirectly on the following nine Special Protection Areas or their Qualifying Interests examined and therefore they have been screened out for Stage 2 Appropriate Assessment (AA).

- River Shannon and River Fergus Estuaries SPA

- Loop Head SPA
- Tralee Bay Complex SPA
- Kerry Head SPA
- Magharee Islands SPA
- Dingle Peninsula SPA
- Illaunonearaun SPA
- Mid-Clare Coast SPA
- Blasket Islands SPA

5.4.4 Pollution Event

The International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/78, MARPOL is short for maritime pollution and 73/78 short for the years 1973 and 1978) is one of the most important international marine environmental conventions. It aims to prevent both operational and accidental discharge into the marine from sea going vessels. Ireland ratified the various elements of the MARPOL Convention through the Sea Pollution Act 1991, the Sea Pollution (Amendment) Act 1999 and the Sea Pollution (Miscellaneous Provisions) Act 2006. It was given further legal effect through several Statutory Instruments under these Acts. The Acts place a legal obligation upon operators of vessels to implement measures to prevent both operational and accidental discharges from ships of substances, which may damage the marine environment as well as human health. In light, of these legal obligations, an incidence of pollution, whether from operational activities or from an accidental occurrence is considered not likely and therefore sites further than 15km from the Foreshore Licence Application Area are not considered further in this screening report in this respect.

All vessels used shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. Therefore, it is considered not likely that there would be any occurrence of a pollution event that could directly or indirectly affect any of the sites or their Qualifying Interests.

5.5 Screening for In-combination Effects

Developments in the area considered for potential interaction with the proposed site investigation activities were:

- FS007081 DesignPro Cahiracon Quay Tidal Energy Testing
- FS007083 Eirgrid Cross Shannon 400 kV Electricity Cable
- FS007041 Kerry Coco Maintenance Dredging and Disposal at Sea, Fenit Harbour, Co Kerry
- FS006885 NUIG Waverider Buoy– Brandon Bay
- FS006474 Kerry County Council - Tralee Bay Dredging
- FS006975 Shannon Foynes Port Company Maintenance Dredging
- FS006837 Shannon Foynes Port Company Jetty Construction
- FS006594 Shannon Foynes Port Company Site Investigations
- FS006578 Aughinish Alumina Ltd Maintenance Dredging
- FS007375 Mainstream Renewable Power Offshore Wind Farm (OWF) Site Investigations

These can be seen in Figure 5-1 below. Details of these projects, their interaction with the activities proposed under this Foreshore Licence Application and the potential for likely in-combination effects is set out in Table 5-5 below.

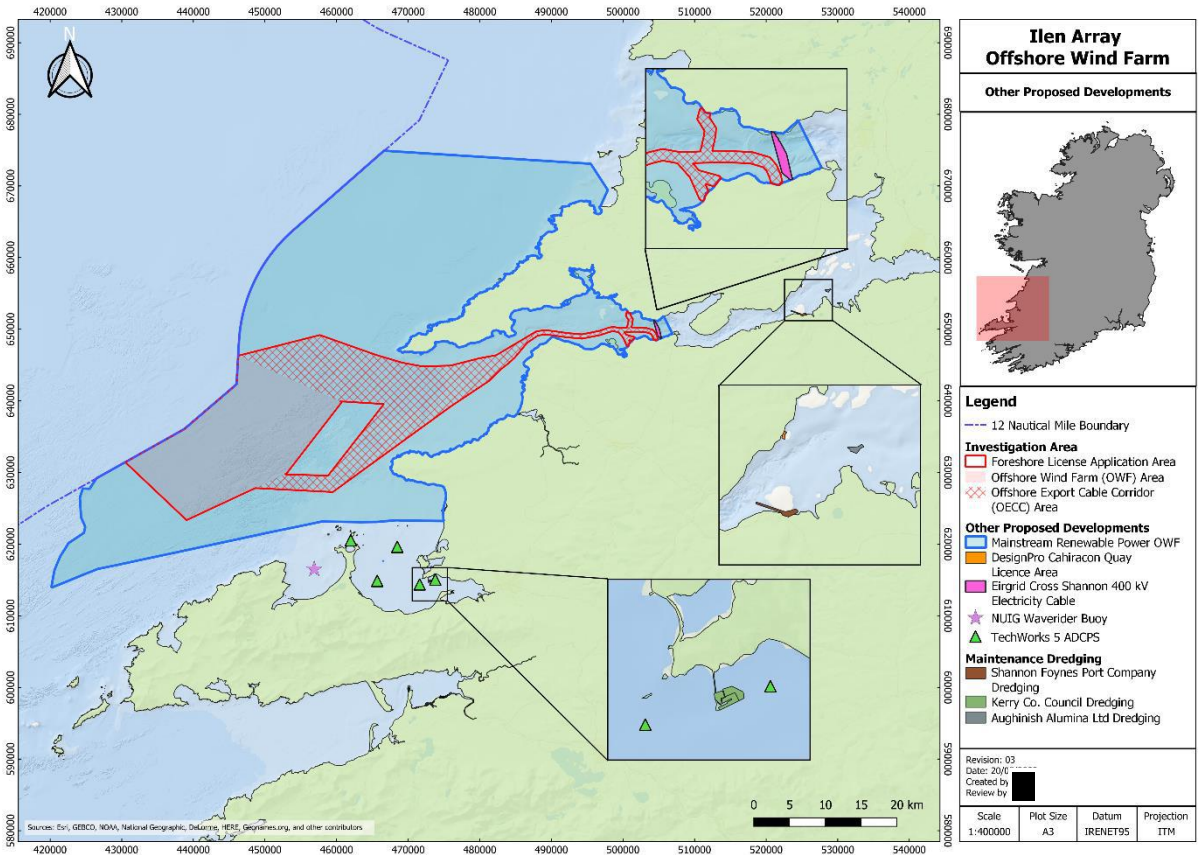

Figure 5-1 Other proposed development

Table 5-5 Consideration of likelihood of in-combination effects

Project/Activity/Development name and application/licence reference number	Licence status	Proposed activities	Spatial Overlap	Potential in – combination effects	Conclusion
FS007375 Mainstream Offshore Wind Farm Site Investigations	Applied	Geophysical, geotechnical, metocean, floating LiDAR, benthic ecology and marine mammals and bird monitoring surveys in support of a site investigation for an Offshore Wind Farm..	Overlap	There is spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. A temporal overlap is possible and the activities proposed under both applications may mean potential for in-combination effects on marine mammals and twaite shad due to underwater noise if geophysical surveys are undertaken within the overlapping time period, depending on the parameters of the surveys.	**Possible in-combination effects**
FS007081 DesignPro Cahiracon Quay Tidal Energy Testing	Consultation	Submerged tidal energy device composed of twin, vertical-axis turbines mounted either side of a buoyant, teardrop vessel off the pier at Inishmurry (Cahiracon, Co Clare)	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effect**

Project/Activity/Development name and application/licence reference number	Licence status	Proposed activities	Spatial Overlap	Potential in – combination effects	Conclusion
FS007083 Eirgrid Cross Shannon 400 kV Electricity Cable	Consultation	Foreshore application for the installation of submarine electricity cables across the Lower Shannon Estuary.	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**
FS007041 Kerry Coco Maintenance Dredging and Disposal at Sea, Fenit Harbour, Co Kerry	Determined	Maintenance dredging and disposal at sea from Fenit harbour and marina.	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**
FS006885 NUIG Waverider Buoy– Brandon Bay	Determination	Foreshore Lease/Licence application for the deployment of a 0.9m diameter Datawell MkIV waverider over a two year period to supplement academic research being undertaken on coastal dynamics and beach erosion/recovery of Brandon Bay.	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the	**No likely in-combination effects**

Project/Activity/Development name and application/licence reference number	Licence status	Proposed activities	Spatial Overlap	Potential in – combination effects	Conclusion
				activities proposed under the two applications.	
FS006474 Kerry County Council - Tralee Bay Dredging	Determination	Dredging of the commercial berth and maneuvering area and the disposal of dredge material to a dump site at Fenit Harbour & Tralee Bay, Co Kerry	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**
FS006975 Shannon Foynes Port Company Maintenance Dredging	Applied	Foreshore Licence Application for Maintenance Dredging in Foynes Port, County Limerick	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**
FS006837 Shannon Foynes Port Company Jetty Construction	Determined	Foreshore Lease/Licence application for proposed works involving the construction of an open jetty structure to facilitate the connection of the existing East Jetty and West Quay structures located in the Port	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects	**No likely in-combination effects**

Project/Activity/Development name and application/licence reference number	Licence status	Proposed activities	Spatial Overlap	Potential in – combination effects	Conclusion
		of Foynes, providing an extension to the length of the existing berths in the Port.		given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	
FS006594 Shannon Foynes Port Company Site Investigations	Determination	Site investigations comprising up to 24 nr boreholes and 4 nr grab samples on the foreshore at Corging, Foynes, Co Limerick	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**
FS006578 Aughinish Alumina Ltd Maintenance Dredging	Determination	Plough dredging ongoing at the Aughinish Alumina deepwater jetty,	No overlap	There is no spatial overlap between this application and that for the Ilen Array Offshore Wind Farm Project. Activities under the two applications are not likely to result in in-combination effects given the lack of spatial overlap and given the nature of the activities proposed under the two applications.	**No likely in-combination effects**

5.6 Screening Statement

The possible effects on the Special Areas of Conservation, Special Protection Areas and the relevant Qualifying Interests/Special Conservation Interests have been assessed in this report which is provided in support of Screening for Appropriate Assessment.

Likely significant effects could not be screened out in the absence of mitigation measures at this stage for to the following designated Annex I habitats in the Lower River Shannon SAC, and therefore a Stage 2 Appropriate Assessment is required:

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Large shallow inlets and bays [1160]
- Reefs [1170]

Likely significant effects, either alone or in combination with other plans or projects, have been screened out for all the remaining SACs considered in this report in respect of their Annex I Habitats. Likely significant effects either alone or in-combination with other plans and projects have also been screened out for any of the SPAs and their special conservation interests (bird species) considered in this report.

However a number of SACS considered in this report that are designated for the presence of Annex II species could not be screened out at this stage from likely significant effects.

Likely significant effects due to underwater noise as a result of geophysical surveys could not be screened out during the screening exercise in the absence of mitigation measures for a number of Annex II Species. An examination of other plans and projects and their possible interaction with the activities proposed under the Ilen Array Foreshore Licence Application was also undertaken (Section 5.4) and it reached a conclusion that possible in-combination effects due to geophysical surveys can be ruled out.

Therefore the following species and their corresponding SACs have been screened in for further consideration and must proceed to a Stage 2 Appropriate Assessment (Natura Impact Statement):

- Harbour porpoise
- Bottlenose dolphin
- Otter
- Grey seal
- Twaite shad

The sites and their qualifying interests are summarised in Table 5-5.

Table 5-6 Summary of SACs and designated QIs screened in for Stage 2 Appropriate Assessment

Designated Site	Qualifying Interests	Impact
Lower River Shannon SAC	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Large shallow inlets and bays [1160] Reefs [1170]	Physical disturbance to marine benthic communities and sensitive habitats by: Habitat disturbance and smothering during all intrusive site investigation activities. Increased suspension of solids in water column. Vibration from geo-technical equipment.
	Bottlenose dolphin (*Tursiops truncatus*) [1149] Otter (*Lutra lutra*)[1355]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Blasket Islands SAC	Harbour porpoise (*Phocoena phocoena*) [1351] Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Slyne Head Islands SAC	Bottlenose dolphin (*Tursiops truncatus*) [1149] Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Slyne Head Peninsula SAC	Bottlenose dolphin (*Tursiops truncatus*) [1149]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
West Connacht Coast SAC	Bottlenose dolphin (*Tursiops truncatus*) [1149]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Inishbofin and Inishshark SAC	Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Roaringwater Bay and Islands SAC	Harbour porpoise (*Phocoena phocoena*) [1351] Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Duvillaun Islands SAC	Bottlenose dolphin (*Tursiops truncatus*) [1149] Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).

Designated Site	Qualifying Interests	Impact
Inishkea Islands SAC	Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Blackwater River (Cork/Waterford) SAC	*Alosa fallax fallax* (Twaite shad)	Disturbance from vibration and underwater noise associated with surveys.
Saltee Islands SAC	Grey seal (*Halichoerus grypus*) [1364]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Lower River Suir SAC	*Alosa fallax fallax* (Twaite shad)	Disturbance from vibration and underwater noise associated with surveys.
Rockabill to Dalkey Island SAC	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
West Wales Marine SAC	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Bristol Channel Approaches SAC	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
North Anglesey Marine SAC	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
North Channel SAC	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Mers Celtiques - Talus du Golfe de Gascogne	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Nord Bretagne DH	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).

Designated Site	Qualifying Interests	Impact
Ouessant-Molène	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Abers - Côte des Legendes	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Chaussée de Sein	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Côte de Granit Rose-Sept-Iles	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Baie de Morlaix	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Tregor Goëlo	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Cap d'Erquy - Cap Fréhel	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Baie de Saint-Brieuc - Est	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Récifs et Landes de la Hague	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Anse de Vauville	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Banc et Récifs de Surtainville	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys.

Designated Site	Qualifying Interests	Impact
		Injury due to collision (survey vessels/sampling equipment).
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Chausey	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Estuaire de la Rance	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).
Baie du Mont Saint-Michel	Harbour porpoise (*Phocoena phocoena*) [1351]	Disturbance from vibration and underwater noise associated with surveys. Injury due to collision (survey vessels/sampling equipment).

6 Impact Assessment (Natura Impact Statement)

The impact of the proposed survey on the QI Annex I Habitats *Sandbanks which are slightly covered by sea water all the* time [1110]; *Estuaries* [1130]; *Large shallow inlets and bays* [1160]; and *Reefs* [1170] within the Lower River Shannon SAC is due to disturbance from contact with substrate by equipment during benthic ecology and geotechnical surveys.

The impact of the proposed survey on Annex II marine mammals and Annex II fish species is as a result of disturbance from underwater noise associated with the proposed geophysical and geotechnical survey activities and also from shipping noise associated with the survey.

A detailed assessment of the potential effects on the listed Annex I habitats and Annex II species, along with appropriate mitigation for the effects is in the accompanying document Ilen Array Offshore Wind Farm Natura Impact Statement.

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NPWS 2014j Roaringwater Bay and Islands SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000101.pdf Accessed on 18/02/2022

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NPWS 2015g The Twelve Bens/Garraun Complex SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002031.pdf Accessed on 18/02/2022

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Appendix I

SPAs selected for their Qualifying Interests – seabirds sensitive to underwater noise and physical disturbance

Site code	Site name	Distance from SPA to the survey site [km]
IE0004005	Cliffs of Moher	34.92
IE0004154	Iveragh Peninsula SPA	37.8
IE0004003	Puffin Island SPA	54.63
IE0004007	Skelligs SPA	62.01
IE0004095	Kilcolman Bog SPA	64.85
IE0004175	Deenish Island and Scariff Island SPA	66.49
IE0004155	Beara Peninsula SPA	76.74
IE0004066	The Bull and The Cow Rocks SPA	82.55
IE0004156	Sheep's Head to Toe Head SPA	93.06
IE0004030	Cork Harbour SPA	100.66
IE0004190	Galley Head to Duneen Point SPA	116.96
IE0004028	Blackwater Estuary SPA	121.75
IE0004021	Old Head of Kinsale SPA	121.79
IE0004022	Ballycotton Bay SPA	124.44
IE0004023	Ballymacoda Bay SPA	124.77
IE0004219	Courtmacsherry Bay SPA	125.65
IE0004191	Seven Heads SPA	130.36
IE0004032	Dungarvan Harbour SPA	130.95
IE0004192	Helvick Head to Ballyquin SPA	134.98
IE0004002	Saltee Islands SPA	195.69
IE0004092	Tacumshin Lake SPA	202.66
IE0004127	Wicklow Head SPA	232.39
IE0004113	Howth Head Coast SPA	241.19
IE0004117	Ireland's Eye SPA	241.72
IE0004122	Skerries Islands SPA	247.47
IE0004069	Lambay Island SPA	247.74
Other states		
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire	265.4
UK9014041	Grassholm SPA	282.05
UK9013121	Aberdaron Coast and Bardsey Island	302.33
UK9020328	Irish Sea Front	308.18
UK9020291	Copeland Islands	344.9

Site code	Site name	Distance from SPA to the survey site [km]
UK9001341	Rum	512.89
UK9001031	St Kilda	574.39
ES0000495	Espacio marino de Punta de Candelaria-Ría de Ortigueira Estaca de Bares	954.37
ES0000497	Espacio marino de la Costa da Morte	970.82
ES0000494	Espacio marino de Cabo Peñas	1005.66
ES0000318	Cabo Busto-Luanco	1015.83
ES0000499	Espacio marino de las Rías Baixas de Galicia	1084.05
ES0000144	Urdaibaiko itsasadarra / Ría de Urdaibai	1128.12
FR5212016	Mers Celtiques - Talus du golfe de Gascogne	447.86
FR2512005	Nord Bretagne DO	495.72
FR5310072	Ouessant-Molène	541.6
FR5310011	Côte de Granit Rose-Sept Iles	560.45
FR5312009	Roches de Penmarc'h	632.44
FR5310057	Archipel de Glénan	647.47
FR2510037	Chausey	671.26
FR2310045	Littoral seino-marin	719.22
FR5312011	Iles Houat-Hoëdic	733.53
FR2512001	Littoral augeron	737.18
FR5212013	Mor Braz	743.3
FR5310074	Baie de Vilaine	744.27
FR5210103	Estuaire de la Loire	783.22
FR5212015	Secteur marin de l'île d'Yeu jusqu'au continent	802.71
FR5412026	Pertuis Charentais - Rochebonne	839.81
FR7212013	Estuaire de la Bidassoa et baie de Fontarabie	1160.68

Appendix II

Relevant Qis and their sensitivity to physical disturbance and/or underwater noise

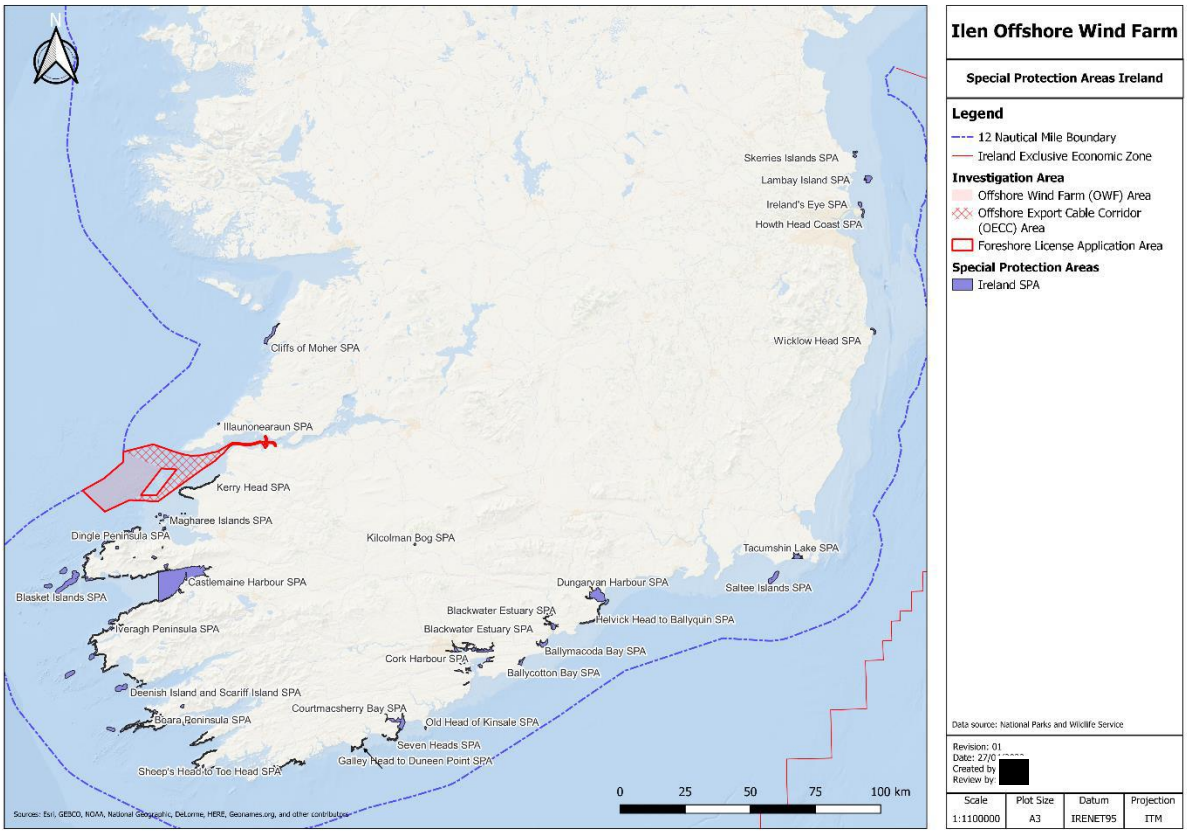
Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
IE0004002	Saltee Islands SPA	Atlantic puffin	✓	✓
		Black-legged kittiwake	✓	x
		Northern fulmar	✓	x
		Lesser black-backed gull	✓	x
		Manx shearwater	✓	✓
		Northern gannet	✓	✓
IE0004023	Old Head of Kinsale SPA	Northern fulmar	✓	x
		Manx shearwater	✓	✓
		Black-legged kittiwake	✓	x
IE0004066	The Bull and The Cow Rocks SPA	Storm petrel	✓	x
		Northern fulmar	✓	x
		Northern gannet	✓	✓
		Black-legged kittiwake	✓	x
IE0004175	Deenish Island and Scariff Island SPA	Northern fulmar	✓	x
		Manx shearwater	✓	✓
		Storm petrel	✓	x
IE0004003	Puffin Island SPA	Manx shearwater	✓	✓
		Northern fulmar	✓	x
IE0004007	Skelligs SPA	Storm petrel	✓	x
		Northern fulmar	✓	x
		Manx shearwater	✓	✓
		Northern gannet	✓	✓
IE0004008	Blasket Islands SPA	Storm petrel	✓	x
		Northern fulmar	✓	x
		Manx shearwater	✓	✓
IE0004125	Magharee Islands SPA	Storm petrel	✓	x
		Northern fulmar	✓	x
IE0004154	Iveragh Peninsula SPA	Black-legged kittiwake	✓	x
		Northern fulmar	✓	x
IE0004192	Helvick Head to Ballyquin SPA	Razorbill	✓	✓
		Black-legged kittiwake	✓	x
		Northern fulmar	✓	x
		Common guillemot	✓	✓
		Herring gull	✓	x

Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
IE0004022	Ballycotton Bay SPA	Lesser black-backed gull	✓	x
IE0004023	Ballymacoda Bay SPA	Lesser black-backed gull	✓	x
IE0004028	Blackwater Estuary SPA	Lesser black-backed gull	✓	x
IE0004030	Cork Harbour SPA	Lesser black-backed gull	✓	x
IE0004092	Tacumshin Lake SPA	Lesser black-backed gull	✓	x
IE0004190	Galley Head to Duneen Point SPA	Northern fulmar	✓	x
IE0004005	Cliffs of Moher	Northern fulmar	✓	x
IE0004032	Dungarvan Harbour SPA	Lesser black-backed gull	✓	x
IE0004069	Lambay Island SPA	Northern fulmar	✓	x
		Manx shearwater	✓	✓
IE0004095	Kilcolman Bog SPA	Lesser black-backed gull	✓	x
IE0004113	Howth Head Coast SPA	Northern fulmar	✓	x
IE0004119	Loop Head SPA	Northern fulmar	✓	x
IE0004117	Ireland's Eye SPA	Northern fulmar	✓	x
IE0004122	Skerries Islands SPA	Northern fulmar	✓	x
IE0004127	Wicklow Head SPA	Northern fulmar	✓	x
IE0004153	Dingle Peninsula SPA	Northern fulmar	✓	x
IE0004114	Illaunonearaun SPA	Northern fulmar	✓	x
IE0004156	Sheep's Head to Toe Head SPA	Northern fulmar	✓	x
IE0004155	Beara Peninsula SPA	Northern fulmar	✓	x
IE0004189	Kerry Head SPA	Northern fulmar	✓	x
Other states				
UK9020328	Irish Sea Front SPA	Manx shearwater	✓	✓
UK9014041	Grassholm SPA	Northern gannet	✓	✓
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire	Storm petrel	✓	x
		Manx shearwater	✓	✓
		Lesser black-backed gull	✓	x
UK9013121	Aberdaron Coast and Bardsey Island	Manx shearwater	✓	✓
UK9020291	Copeland Islands	Manx shearwater	✓	✓
UK9001341	Rum	Manx shearwater	✓	✓
UK9001031	St Kilda	Manx shearwater	✓	✓
ES0000144	Urdaibaiko itsasadarra / Ría de Urdaibai	Manx shearwater	✓	✓
ES0000318	Cabo Busto-Luanco	Manx shearwater	✓	✓

Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
ES0000494	Espacio marino de Cabo Peñas	Manx shearwater	✓	✓
ES0000495	Espacio marino de Punta de Candelaria-Ría de OrtigueiraEstaca de Bares	Manx shearwater	✓	✓
ES0000497	Espacio marino de la Costa da Morte	Manx shearwater	✓	✓
ES0000499	Espacio marino de las Rías Baixas de Galicia	Manx shearwater	✓	✓
FR5312011	Iles Houat-Hoëdic	Manx shearwater	✓	✓
FR5412026	Pertuis Charentais - Rochebonne	Manx shearwater	✓	✓
FR2510037	Chausey	Manx shearwater	✓	✓
FR2310045	Littoral seino-marin	Manx shearwater	✓	✓
FR5310011	Côte de Granit Rose-Sept Iles	Manx shearwater	✓	✓
FR5310072	Ouessant-Molène	Manx shearwater	✓	✓
FR2512001	Littoral augeron	Manx shearwater	✓	✓
FR2512005	Nord Bretagne DO	Manx shearwater	✓	✓
FR5212016	Mers Celtiques - Talus du golfe de Gascogne	Manx shearwater	✓	✓
FR5212015	Secteur marin de l'île d'Yeu jusqu'au continent	Manx shearwater	✓	✓
FR5212013	Mor Braz	Manx shearwater	✓	✓
FR5310057	Archipel de Glénan	Manx shearwater	✓	✓
FR5310072	Ouessant-Molène	Manx shearwater	✓	✓
FR7212013	Estuaire de la Bidassoa et baie de Fontarabie	Manx shearwater	✓	✓
FR5310074	Baie de Vilaine	Manx shearwater	✓	✓
FR5312009	Roches de Penmarc'h	Manx shearwater	✓	✓
FR5210103	Estuaire de la Loire	Manx shearwater	✓	✓

Appendix III

SPAs within Ireland considered relevant to this report.



SPAs outside Ireland considered relevant to this report.