Ilen Array Offshore Wind Farm

Foreshore Licence Application for Site Investigation Works

Natura Impact Statement

Document Control

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List of Abbreviations

AA	Appropriate Assessment
ADCP	Acoustic Doppler Current Profiler
API	American Petroleum Institute
BH	Borehole
CE	CE Atlantic
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
MPDM	Marine Planning and Development Management Bill
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 License Application Area	An area within the 12nm boundary of the Irish coastline where a Foreshore License 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 License 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: Summary of information in Support of Appropriate Assessment Screening (Stage 1 Screening)
- Chapter 4: Stage 2 Natura Impact Statement

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 License 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.

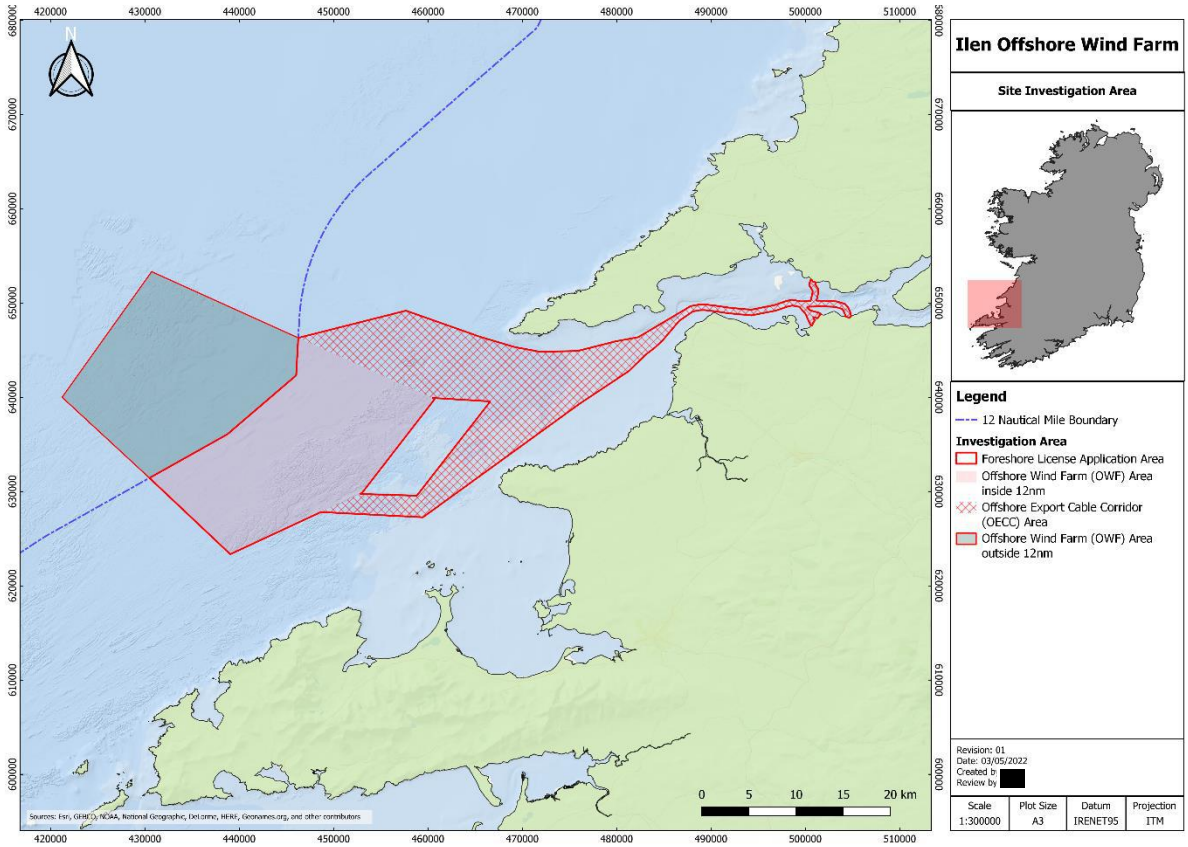

Figure 1-1: Foreshore Licence Application Area (red) and Offshore Wind Farm Area outside 12 NM (grey; for information purposes only)

1.4 Site investigation activities

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. A detailed description of the proposed site investigation activities can be found in the accompanying Ilen Array OWF document Supporting Information for Screening of Appropriate Assessment (SISAA).

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 the accompanying document Ilen Array OWF SISAA 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 2 Natura Impact Statement of the Appropriate Assessment process.

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).

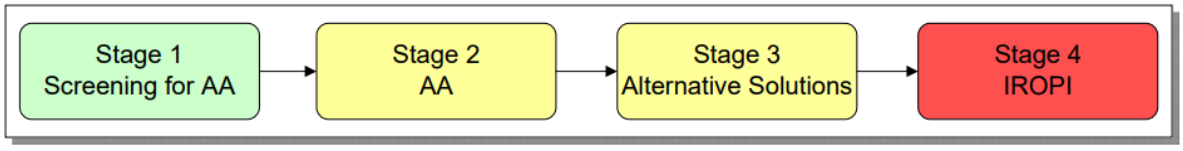

Figure 2-1: Stages in the AA process (Source: DEHLG, 2009)

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 Supporting Information for a Stage 2 Appropriate Assessment (Natura Impact Statement)

3.1 Outcome of Screening for Appropriate Assessment

Table 3-1 lists the sites and their Qualifying Interests that are screened in for further assessment in under a Stage 2 AA, together with the Impacts that may result in "Likely Significant Effects" to conservation objectives in the absence of mitigation measures. The screening process is described in full in the Ilen Array OWF SISAA.

Table 3-1 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).

Designated Site	Qualifying Interests	Impact
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).
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		

Designated Site	Qualifying Interests	Impact
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).
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.

Designated Site	Qualifying Interests	Impact
		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. 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).

3.2 Conservation Objectives for Qualifying Interests

Conservation objectives for all sites screened in for Stage 2 AA (NIS) are set out in Appendix I to this report.

4 Impact Assessment

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 which is discussed in detail in the accompanying Ilen Array Offshore Wind Farm SISAA.

4.1 Benthic Habitats (Annex I Habitats)

The conservation objectives with respect the Lower River Shannon SAC are set out in Appendix I.

The benthic habitats *Sandbanks which are slightly covered by sea water all the time* [1110]; *Estuaries* [1130]; *Large shallow inlets and bays* [1160]; and *Reefs* [1170] may be affected by the geotechnical and benthic ecology surveys including subtidal and intertidal walkover and sampling surveys.

Mitigation:

For subtidal surveys an ROV or camera will be used in advance of grab sampling to identify areas of protected habitat. If protected habitat is identified the area will not be subject to physical sampling and camera or video will be used as an alternative. Siting of boreholes will be subject to prior inspection of the area by ROV or camera and alternative borehole sites will be found in the event that protected habitat is detected.

With respect to intertidal surveys: surveys will be undertaken within daylight hours and sensitive species within the survey area will be identified, recorded and avoided during sampling.

Samples taken within the intertidal area will be small and by their nature will be taken from soft sediments only. In addition only a small number of samples will be taken (4-5 along the intertidal area from low water mark to high water mark). The total area affected will be very small in comparison to the overall intertidal area and given the nature of the sediment and its location will be very temporary in effect (likely filled in by the rising tide).

The implementation of these mitigation measures will ensure that adverse effects are avoided in the case of subtidal or offshore surveys and minor to imperceptible in the case of intertidal habitats. These measures will ensure that the SAC will not be adversely affected, and the integrity of Lower River Shannon SAC will be maintained.

4.2 Otter (Lutra lutra)

The conservation objectives to maintain the favourable conservation condition of the otter (*Lutra lutra*) [1355] at Lower River Shannon SAC are listed in Appendix I.

The proposed survey will not impact on any of the conservation objectives for the otter as defined in Appendix I. However, the species may be impacted by disturbance from vibration and underwater noise associated with the proposed site investigation activities as well as disturbance from the site investigation activities generally. The otter is not known to be very sensitive to noise in the water however the site investigation activities could impact on the species if they enter the site investigation activities area. There is also a risk of injury due to collision (survey vessels/sampling equipment).

Mitigation: The proposed activities will be short in duration and of a temporary nature and compliant with DAHG (2014) (Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters) which will ensure that the proposed site investigation activities will have no adverse effect on harbour porpoise. This to include visual observation during daylight hours and the use of 'soft-start' procedures. These measures will ensure that any adverse effect due to disturbance caused by underwater noise will be mitigated for. In addition, the survey vessels will be slow moving (c. 5 knots) and therefore any risk due to collision is mitigated for. (Please see Appendix II in this document for detail relating to compliance with the NPWS 2014 Guidance referenced above).

Therefore, the conservation objectives for the Lower River Shannon SAC (002122) will not be adversely impacted and the integrity of this site will be maintained.

4.3 Twaite shad (*Alosa fallax fallax*)

The conservation objectives for the twaite shad (*Alosa fallax*) [1103] in Blackwater River (Cork/Waterford) SAC and Lower River Suir SAC are set out in Appendix I and in the following list of targets and attributes:

- distribution and access from the estuary;
- more than one age class present in population structure;
- no decline in extent of spawning habitats;
- good water quality;
- and good spawning habitat quality.

The proposed survey will not affect any of the conservation objectives for the twaite shad, as listed above and in Appendix I. However, the species may be affected by disturbance from underwater noise associated with the proposed survey it if is within the site when the surveys are being undertaken. Twaite shad hear in the 30 – 60kHz frequency range (Teague & Clough, 2011). For further information on the affects to twaite shad from underwater noise please refer to Section 3.2.2 of the accompanying Ilen Array Offshore Wind Farm SISAA.

Mitigation: The proposed works are temporary in nature and of short duration. The protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will be followed at all times and while that guidance was not written with Twaite Shad in mind it includes the use of the 'soft-start' procedure which is a suitable mitigation measure for twaite shad. These measures will ensure that any adverse effect due to disturbance caused by underwater noise will be mitigated for. (Please see Appendix II in this document for detail relating to compliance with the NPWS 2014 Guidance referenced above).

As a result, there will be no adverse effect on the conservation objectives of the Blackwater River (Cork/Waterford) SAC and Lower River Suir SAC and the integrity of these sites will be maintained.

4.4 Grey seal (*Halichoerus grypus*)

The conservation objectives to maintain the favourable conservation condition of the grey seal (*Halichoerus grypus*)[1364] in Roaringwater Bay and Islands SAC, Inishbofin and Inishshark SAC, Duvillaun Islands SAC, Inishkea Islands SAC, and Saltee Islands SAC are defined by the following attributes and targets:

- Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use.
- Breeding behaviour: Conserve the breeding sites in a natural condition.
- Moulting behaviour: Conserve the moult haul-out sites in a natural condition.
- Resting behaviour: Maintain the resting haul-out sites in a natural condition.
- Disturbance: Human activities should occur at levels that do not adversely affect the grey seal population at the site.

The site investigation activities will not impact on any of the conservation objectives for the grey seal, as listed above. However, the species may be impacted by disturbance from vibration and underwater noise associated with the site investigation activities. Grey seal hear in the low frequency range (75-75,000 Hz) (DAHG, 2014) and therefore, are susceptible to noise vibration of Shipping, SBP, UHRS, Drilling surveys. These activities have the potential to be within the hearing threshold of grey seals. There is also a risk of injury due to collision (survey vessels/sampling equipment).

Mitigation: The proposed works are temporary in nature and of short duration. The protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will be followed at all times and while that guidance was not written with Twaite Shad in mind it includes the use of the 'soft-start' procedure which is a suitable mitigation measure for twaite shad. These measures will ensure that any adverse effect due to disturbance caused by underwater noise will be mitigated for. (Please see Appendix II in this document for detail relating to compliance with the NPWS 2014 Guidance referenced above).

Therefore, the conservation objectives for the grey seal population at Roaringwater Bay and Islands SAC, Inishbofin and Inishshark SAC, Duvillaun Islands SAC, Inishkea Islands SAC, and Saltee Islands SAC will not be adversely affected and integrity of all these sites will be maintained.

4.5 Bottlenose dolphin (*Tursiops truncatus*)

The conservation objectives to maintain the favourable conservation condition of the bottlenose dolphin (*Tursiops truncatus*) [1349] in Lower River Shannon SAC, Slyne Head Islands SAC, Slyne Head Peninsula SAC, West Connacht Coast SAC, and Duvillaun Islands SAC are defined by the following attributes and targets:

- Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use
- Habitat use: Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.
- Disturbance: Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site.

The site investigation activities will not impact on any of the conservation objectives for the bottlenose dolphin, as listed above. However, the species may be impacted by disturbance from vibration and underwater noise associated with the site investigation activities. Bottlenose dolphin hears in the mid frequency range (150 - 160,000Hz) (Southall et. al., 2007) and therefore, is susceptible to noise vibration of Shipping, SBP, UHRS, Drilling surveys. These activities have the potential to be within the hearing threshold of bottlenose dolphins. There is also a risk of injury due to collision (survey vessels/sampling equipment).

Mitigation: The proposed works are temporary in nature and of short duration. The protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will be followed at all times and while that guidance was not written with Twaite Shad in mind it includes the use of the 'soft-start' procedure which is a suitable mitigation measure for twaite shad. These measures will ensure that any adverse effect due to disturbance caused by underwater noise will be mitigated for. (Please see Appendix II in this document for detail relating to compliance with the NPWS 2014 Guidance referenced above).

Therefore, the conservation objectives for the bottlenose dolphin population at Lower River Shannon SAC, Slyne Head Islands SAC, Slyne Head Peninsula SAC, West Connacht Coast SAC, and Duvillaun Islands SAC will not be adversely affected, and integrity of these sites will be maintained.

4.6 Harbour porpoise (*Phocoena phocoena*)

The conservation objectives to maintain the favourable conservation condition of harbour porpoise (*Phocoena phocoena*) [1351] in West Wales Marine SAC, North Anglesey Marine SAC, Bristol Channel Approaches and North Channel SAC are listed in Appendix I and can be summarised as follows: Ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that: harbour porpoise is a viable component of the site; there is no significant disturbance of the species; and the condition of supporting habitats and processes, and the availability of prey is maintained.

The conservation objectives to maintain the favourable conservation condition of harbour porpoise (*Phocoena phocoena*) in Rockabill to Dalkey Island SAC, Roaringwater Bay SAC and Blasket Islands SAC are listed in Appendix I.

The conservation objectives for harbour porpoise at 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 on the Northern French coast are described as: to maintain or restore species of Community interest and their functional habitats to a favourable conservation status. This objective is a commitment of the Habitats Directive. The aim is to monitor the evolution of the populations of these species, limit their disturbance and maintain their functional habitats in a state of conservation favourable to their ecological requirements. See Appendix I.

The proposed site investigation activities will not affect any of the conservation objectives for the harbour porpoise, as listed above and in Appendix I. However, the species may be affected by disturbance from underwater noise associated with the proposed site investigation activities. Harbour porpoise (*Phocoena phocoena*) hear in the high frequency range (200-180,000Hz) (DAHG, 2014). The greatest potential effect on this species from the proposed site investigation activities would be from geophysical site investigation activities depending on the equipment and frequencies used. These activities have the potential to be within the hearing threshold of Harbour porpoise. There is also a risk of injury due to collision (survey vessels/sampling equipment).

Mitigation: The proposed works are temporary in nature and of short duration. The protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will be followed at all times and while that guidance was not written with Twaite Shad in mind it includes the use of the 'soft-start' procedure which is a suitable mitigation measure for twaite shad. These measures will ensure that any adverse effect due to disturbance caused by underwater noise will be mitigated for. (Please see Appendix II in this document for detail relating to compliance with the NPWS 2014 Guidance referenced above).

Therefore, the conservation objectives for the Harbour porpoise at Rockabill to Dalkey Island SAC, Roaringwater Bay SAC, Blasket Islands SAC, West Wales Marine SAC (UK0030397), North Anglesey Marine SAC, Bristol Channel Approaches, 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 SAC will not be adversely affected and the integrity of the sites will be maintained.

4.7 In-combination effects

4.7.1 Assessment of In-combination Effects from other Plans and Projects

Applications for projects in the same area of coast and including the River Shannon were examined to assess if there was any potential for in-combination effects with the site investigation activities at the Ilen Array. Likely in-combination effects were identified between this application and the following project:

- FS007375 Mainstream Renewable Power Offshore Wind Farm (OWF) Site Investigations

Those possible in-combination effects were identified and assessed in the SISAA and where it was found that there was a possibility of in-combination effects relevant mitigation measures were incorporated into this assessment.

Having examined the possible likely effects of this project it is concluded that due to the:

1. Implementation of effective communication between Ilen Array Offshore Wind Farm and the project listed above;
2. Likely timing and phased nature of proposed activities;
3. Temporary nature of proposed activities;
4. Very localised and imperceptible effects of proposed activities; and
5. Implementation of the DAHG (2014) best practice guidelines;

adverse in-combination effects of the proposed activities with the projects identified as having possible in-combination effects (see SISAA and Appendix I) on the conservation objectives of the Natura 2000 sites assessed in this report is considered not likely.

5 Appropriate Assessment Conclusion

The screening conducted in the Ilen Array Offshore Wind Farm SISAA identified the likely significant effects on the SACs, SPAs and QIs (Natura 2000) assessed in this report; 29 Natura 2000 sites were screened in for a Stage 2 AA (NIS).

This NIS has examined and analysed, in light of the best scientific knowledge available with respect to the sites screened in for a Stage 2 AA, the potential impact sources and pathways, how these could impact on the sites' Qualifying Interests and whether the predicted impacts would adversely affect the integrity of the European site. Mitigation measures are set out in Section 4 and they ensure that any adverse effects on the conservation objectives of the sites assessed will be avoided during the activities proposed under this application for Foreshore Licence and that the integrity of the sites assessed will be maintained.

Therefore, in view of best scientific knowledge, the nature of the predicted impacts from the proposed survey (see SISAA) are considered not likely to result in significant effects (alone or in-combination) on the Conservation Objectives of any Natura 2000 site examined in this report.

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NPWS 2014i West Connacht Coast SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002998.pdf Accessed on 18/02/2022

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

NPWS 2014k Rockabill to Dalkey Island SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY003000.pdf Accessed on 18/02/2022

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NPWS 2015d Mid-Clare Coast SPA. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004182.pdf Accessed on 18/02/2022

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NPWS 2015f Connemara Bog Complex SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002034.pdf Accessed on 18/02/2022

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

NPWS 2015h Lough Corrib SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000297.pdf Accessed on 18/02/2022

NPWS 2015i Owenduff/Nephin Complex SAC. Qualifying Interests and Site Documents available at https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000534.pdf Accessed on 18/02/2022

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Appendix I

The following conservation objectives are taken directly from the National Parks and Wildlife Service website (NPWS.ie).

Lower River Shannon SAC

Conservation objectives for: Lower River Shannon SAC [002165]			
1349 Bottlenose dolphin *Tursiops truncatus*			
To maintain the favourable conservation condition of bottlenose dolphin in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	Attribute and target based on Ingram and Rogan (2002), Englund et al. (2007), Englund et al. (2008), Berrow (2009), Berrow et al. (2010) and review of data from other studies
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	
1355 Otter *Lutra lutra*			
To restore the favourable conservation condition of Otter in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in Shannon catchment estimated at 70.5% (Bailey and Rochford 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 596.8ha above high water mark (HWM); 958.9ha along river banks/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 4,461.6ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 500.1km	No field survey. River length calculated on the basis that otters will utilise freshwater

			habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 125.6ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilogram	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m. e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed
1110 Sandbanks which are slightly covered by sea water all the time			
To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Habitat distribution	Occurrence	The distribution of sandbanks is stable, subject to natural processes.	Distribution established using the Valentia Island to River Shannon Admiralty Chart (no. 1819_0)
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	Habitat area was estimated as 1,353ha using the Valentia Island to River Shannon Admiralty Chart (no. 1819_0)
Community distribution	Hectares	Conserve the following community type in a natural condition: Subtidal sand to mixed sediment with Nephtys spp. community complex.	The likely area of the community was derived from a sandbank survey in 2007 (Aquafact, 2007) and a subtidal survey in 2010 (Aquafact, 2011a).
1130 Estuaries			
To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Habitat area	Hectares	The permanent habitat area is	Habitat area was estimated as 24,273ha using OSi data and the Transitional Water Body area as defined under the Water

		stable or increasing, subject to natural processes.	Framework Directive
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community.	The likely area of these communities was derived from intertidal and subtidal surveys undertaken in 2010 (Aquafact, 2011a and c). S
1160 Large shallow inlets and bays			
To maintain the favourable conservation condition of Large shallow inlets and bays in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	Habitat area was estimated as 35,282ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pontocrates spp. community; Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans	The likely area of these communities was derived from intertidal and subtidal surveys in 2010 (Aquafact, 2011a and c).

		community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone-dominated subtidal reef community; and Laminaria-dominated community complex	
1170 Reefs			
To maintain the favourable conservation condition of Reefs in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Habitat distribution	Occurrence	The distribution of Reefs is stable, subject to natural processes. S	Distribution is established from intertidal and subtidal reef surveys in 2010 (Aquafact, 2011b and c)
Habitat area	Hectares	The permanent habitat area is stable, subject to natural processes	Habitat area was estimated as 21,421ha from the 2010 intertidal and subtidal reef survey (Aquafact 2011b and c)
Community distribution	Hectares	Conserve the following reef community types in a natural condition: Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone-dominated subtidal reef community; and Laminaria-dominated community complex	Based on the 2010 intertidal and subtidal reef survey (Aquafact, 2011b and c).

Blasket Islands SAC

Conservation objectives for: Blasket Islands SAC [002172]
1351 Harbour porpoise *Phocoena phocoena*

To maintain the favourable conservation condition of harbour porpoise in Blasket Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Blasket Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	Attribute and target based on background knowledge of Irish breeding populations, comprehensive breeding surveys in 1996 (Kiely, 1998; Kiely and Myers, 1998), 2003 (Cronin and Ó Cadhla, 2004; Cronin et al., 2007), and 2005 (Ó Cadhla et al., 2008) and 2011 (Ó Cadhla et al., 2013) and unpublished NPWS records including those reported by Lyons (2004).
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	Attribute and target based on background knowledge of Irish populations, on review of data from Kiely (1998) and Lyons (2004), a national moult survey (Ó Cadhla and Strong, 2007) and unpublished NPWS records.
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	Attribute and target based on review of data from Kiely (1998), Lyons (2004), Cronin et al. (2004), Ó Cadhla et al. (2008), Duck and Morris (2013) and unpublished NPWS records.
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	

Slyne Head Islands SAC

Conservation objectives for: Slyne Head Islands SAC [000328]
1364 Grey seal *Halichoerus grypus*

To maintain the favourable conservation condition of grey seal in Slyne Head Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	Attribute and target based on background knowledge of Irish breeding populations, review of data from Summers (1983), Lyons (2004), Ó Cadhla et al. (2005), a comprehensive breeding survey in 2005 (Ó Cadhla et al., 2008) and unpublished National Parks and Wildlife Service records
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	Attribute and target based on background knowledge of Irish populations, review of data from Ó Cadhla et al. (2006), a national moult survey (Ó Cadhla and Strong, 2007) and unpublished National Parks and Wildlife Service records.
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	Attribute and target based on review of data from Lyons (2004), Cronin et al. (2004), Ó Cadhla et al. (2005) and unpublished National Parks and Wildlife Service records.
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	
1349 Bottlenose dolphin *Tursiops truncatus*			
To maintain the favourable conservation condition of bottlenose dolphin in the Slyne Head Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	Attribute and target based on Ingram and Rogan (2002), Englund et al. (2007), Englund et al. (2008), Berrow (2009), Berrow et al. (2010) and review of data from other studies
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	

Slyne Head Peninsula SAC

Conservation objectives for: Slyne Head Peninsula [SAC 002074]			
1349 Bottlenose dolphin *Tursiops truncatus*			
To maintain the favourable conservation condition of bottlenose dolphin in the Slyne Head Peninsula SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	Attribute and target based on Ingram and Rogan (2002), Englund et al. (2007), Englund et al. (2008), Berrow (2009), Berrow et al. (2010) and review of data from other studies
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	

West Connacht Coast

Conservation Objectives for: West Connacht Coast SAC [002998]			
1349 Common Bottlenose Dolphin *Tursiops truncatus*			
To maintain the favourable conservation condition of Common Bottlenose Dolphin in West Connacht Coast SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	

Roaringwater Bay and Islands SAC

Conservation objectives for: Roaringwater Bay SAC (000101)
1351 Harbour porpoise *Phocoena phocoena*
To maintain the favourable conservation condition of harbour porpoise in Roaringwater Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Roaringwater Bay SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	

Inishbofin and Inishark SAC

Conservation objectives for: Inishbofin and Inishark SAC (000278)			
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Inishbofin and Inishark SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	

Blackwater River (Cork/Waterford) SAC

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]			
1103 Twaite shad (*Alosa fallax fallax*)			
To restore the favourable conservation condition of twaite shad in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Major weirs on the Blackwater prevent potential exploitation of adult spawning grounds
Population structure: age classes	Number of age classes	More than one age class present	Regular breeding has been confirmed in the River Blackwater in recent years (King and Linnane, 2004; King and Roche, 2008)
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	
Water quality: oxygen levels	Milligrams per litre	No lower than 5mg/l	Attribute and target based on Maas, Stevens and Briene (2008)
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	

Lower River Suir SAC

Conservation Objectives for: Lower River Suir SAC (002137)			
1103 Twaite shad (*Alosa fallax fallax)*			
To restore the favourable conservation condition of twaite shad in Lower River Suir SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes

Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels.
Population structure: age classes	Number of age classes	More than one age class present	Regular breeding has not been confirmed in the River Slaney in recent years based on unpublished NPWS records
Extent and distribution of spawning habitat	m^2 and occurrence	No decline in extent and distribution of spawning habitats	
Water quality: oxygen levels	Milligrams per litre	No lower than 5mg/l	Attribute and target based on unpublished NPWS records
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	

Duvillaun Islands SAC

Conservation objectives for: Duvillaun Islands SAC [000328]			
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Duvillaun Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	

Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	
1349 Bottlenose dolphin *Tursiops truncatus*			
To maintain the favourable conservation condition of bottlenose dolphin in the Duvillaun Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	Attribute and target based on Ingram and Rogan (2002), Englund et al. (2007), Englund et al. (2008), Berrow (2009), Berrow et al. (2010) and review of data from other studies
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	

Inishkea Islands SAC

Conservation objectives for: Inishkea Islands SAC (000507)			
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Inishkea Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	

Saltee Islands SAC

Conservation objectives for: Saltee Islands SAC (000707)			
1364 Grey seal *Halichoerus grypus*			
To maintain the favourable conservation condition of grey seal in Saltee Islands SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition.	
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	
Resting behaviour	Resting haul-out sites	Maintain the resting haulout sites in a natural condition.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	

Rockabill to Dalkey Island SAC

Conservation Objectives for: Rockabill to Dalkey Island SAC (003000)			
1351 Harbour porpoise *Phocoena phocoena*			
To maintain the favourable conservation condition of harbour porpoise in the Rockabill to Dalkey Island SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise population	

West Wales Marine SAC

Conservation Objectives for: West Wales Marine / Gorllewin Cymru Forol SAC (UK0030397)	
1351 Harbour Porpoise (*Phocoena phocoena*)	
To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters.	
Attribute	Target

Species is a viable component of the site	Maintained or restored in the long term – subject to natural change
Disturbance	No significant disturbance of the species
Habitats and processes	Habitats and processes relevant to harbour porpoise and its prey are maintained or restore in the long term – subject to natural change

North Anglesey Marine SAC

Conservation Objectives for: North Anglesey Marine / Gogledd Môn Forol SAC (UK0030398)	
1351 Harbour Porpoise (*Phocoena phocoena*)	
To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise. To ensure for harbour porpoise that: subject to natural change, the following attributes are maintained or restored in the long term	
Attribute	Target
Species is a viable component of the site	Maintained or restored in the long term – subject to natural change
Disturbance	No significant disturbance of the species
Habitats and processes	Habitats and processes relevant to harbour porpoise and its prey are maintained or restore in the long term – subject to natural change

Bristol Channel Approaches SAC

Conservation Objectives for: Bristol Channel Approaches (UK0030396)		
1351 Harbour Porpoise (*Phocoena phocoena)*		
The conservation objectives for the Bristol Channel Approaches SAC are: to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters.		
Attribute	Objective	Notes
Population	Harbour porpoise is a viable component of the site; there is no significant disturbance of the species; and the condition of supporting habitats and processes, and the availability of prey is maintained.	

North Channel SAC

Conservation Objectives for: North Channel SAC (UK0030399)	
1351 Harbour Porpoise (*Phocoena phocoena*)	
Ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters.	
Attribute	Target
Species is a viable component of the site	Maintained or restored in the long term – subject to natural change.

Disturbance	No significant disturbance of the species.
Habitats and processes	Habitats and processes relevant to Harbour Porpoise and its prey are maintained or restore in the long term – subject to natural change.

Franch SACs (Various)

Conservation Objectives for French harbour porpoise SACs	
1351 Harbour porpoise (*Phocoena phocoena*)	
To maintain or restore species of Community interest and their functional habitats to a favourable conservation status. This objective is a commitment of the Habitats Directive. The aim is to monitor the evolution of the populations of these species, limit their disturbance and maintain their functional habitats in a state of conservation favourable to their ecological requirements.	
Site Code	Name
FR5302015	Mers Celtiques - Talus du Golfe de Gascogne
FR2502022	Nord Bretagne DH
FR5300018	Ouessant-Molène
FR5300017	Abers - Côte des Legendes
FR5302007	Chaussée de Sein
FR5300009	Côte de Granit Rose-Sept-Iles
FR5300015	Baie de Morlaix
FR5300010	Tregor Goëlo
FR5300011	Cap d'Erquy - Cap Fréhel
FR5300066	Baie de Saint-Brieuc - Est
FR2500084	Récifs et Landes de la Hague
FR2502019	Anse de Vauville
FR2502018	Banc et Récifs de Surtainville
FR5300012	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard
FR2500079	Chausey
FR5300061	Estuaire de la Rance
FR2500077	Baie du Mont Saint-Michel

Appendix II

Mitigation Measures to prevent harm to Annex II Species screened in for Stage 2 Appropriate Assessment

In line with best practice guidelines 'Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters' from DAHG (2014) which are now being incorporated into the standard operating procedures of all noise emitting surveys in Irish waters, the measures detailed below will be applied to where possible prevent and if not reduce injury and disturbance to Annex II species during all noise emitting site investigation activities. While these are not specifically aimed at twaite or allis shad, the mitigation proposed includes the soft-start procedure, will also be relevant to twaite and allis shad.

Disturbance to any of the species assessed in Chapter 4 will be of a temporary nature. As previously stated, the protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will be followed at all times. This protocol is considered sufficient by the competent authority (NPWS) to mitigate for disturbance to marine mammal species. Again while the protocol is not aimed at twaite or allis shad, they are known to be less sensitive to underwater noise than harbour porpoise and as the protocol is sufficient to address disturbance to this most sensitive of marine mammal species it can also be considered sufficient to address disturbance to twaite or allis shad.

In addition, the proposed works will be short in duration and of a temporary nature and survey vessels will be slow moving (c. 5 knots), therefore any risk due to collision is unlikely.

Marine Mammal Monitoring

A qualified and experienced Marine Mammal Observer (MMO) will be appointed to monitor for marine mammals and to log all relevant events using standardised data forms provided by the DAHG. During daylight hours the MMO(s) will carry out visual observations to monitor for the presence of marine mammals before the soft-start commences and will recommend delays in the commencement of the site investigations should any species be detected within the relevant monitored zone as per the NPWS 2014 guidance (see below).

Pre-start monitoring

Visual (MMO) will be conducted for a pre-soft-start search of 30 minutes i.e. prior to the commencement of marine operations (MBES, SSS, sub-bottom profiling, geotechnical seabed sampling). This will involve a visual observation (during daylight hours) to determine if any marine mammals are within the relevant zone of the activities as per the NPWS 2014 Guidance.

Monitored zone

Should any marine mammal species be detected within a radial distance of the relevant zone of the survey vessel (as per the NPWS 2014 Guidance), commencement of site investigation activities will be delayed until their passage, or the transit of the vessel, results in the cetaceans being of sufficient distance from the vessel to satisfy the NPWS 2014 Guidance. In both cases, there will be a 30-minute delay from the time of the last sighting within the relevant zone of the survey vessel (as per the NPWS 2014 Guidance) to the commencement / recommencement of the operations. The MMO will use a distance measuring stick or reticule binoculars to ascertain distances to marine mammals. *Note: once started site investigations will not cease should marine mammals approach the survey vessel.*

Soft start

A soft start is the gradual ramping of power over a set period of time, to give relevant species adequate time to leave the area.

Once the soft start commences, there is no requirement to halt or discontinue the procedure at night-time, if weather or visibility conditions deteriorate, or if marine mammal species enter the monitored zone (as per the NPWS 2014 Guidance for monitored zones – activity dependent).

In commencing a seismic survey operation, including any testing of seismic sound sources, where the output peak sound pressure level exceeds 170 dB re: 1µPa @1m, the following ramp up procedure will be undertaken in line with the DAHG (2014) guidance:

- Energy output will commence from a low energy start-up and be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes (the exact time period will be dependent on survey parameters and equipment and will be designed in consultation with an experienced marine ecologist).
- This controlled build-up of energy output will occur in consistent stages to provide a steady and gradual increase over the ramp-up period.
- If marine mammals enter or are detected within the monitored zone while the ramp-up procedure is under way but incomplete, the energy output will not be increased until the marine mammals are no longer within the monitored zone.

Line changes

Where the duration of a survey line or station change is greater than 40 minutes, the activity will, on completion of the line/station being surveyed, either cease (i.e., shut down) or preferably undergo a reduction in energy output to a lower state where the peak sound pressure level from any operating source is =<170 dB re 1 µPa @ 1 m. Prior to the start of the next line/station, if the power was shut down, all pre-survey monitoring measures and soft start procedures will be followed as for start-up. If there has been a reduction in power, a soft start will be undertaken gradually from the lower output level. The latter sound reduction measure will be applied to line changes at night-time or in daytime conditions of poor visibility. Where the duration of a survey line/station change is less than 40 minutes the activity will continue as normal (i.e. under full output).

Breaks in survey periods

If there is a break in sound output from survey equipment for a period greater than 10 minutes (e.g., due to equipment failure, shut-down, survey line/station change) then all pre-start monitoring measures and ramp-up procedures will recommence prior to re-starting.

Reporting

All recordings of marine mammal species will be made using standardised data forms provided by the NPWS. Full reporting on operations and mitigation will be provided to the NPWS to facilitate reporting under Article 17 of the EC Habitats Directive and future improvements to guidance (DAHG, 2014). The report will also include feedback on how successful the measures were. This requirement will be communicated to the MMOs at project start up meetings and at crew change.

Survey vessel speed and course

The project survey vessels will be moving at a maximum speed of approximately 5 knots during surveys to allow marine mammal species to move away from the vessel should they be disturbed by the vessel presence or noise emissions. During transit times, the survey vessels will be travelling at speeds greater than 5 knots. However, these movements are not considered to deviate from normal vessel traffic in the Foreshore Licence Application Area. Should a marine mammal species be found to be in the direct path of a survey vessel, during or outside of survey times, the survey vessel will slow down or, if possible, alter course to avoid collision.