Fuinneamh Sceirde Teoranta

Sceirde Rocks Offshore Wind Farm Foreshore Licence Area

Natura Impact Statement

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1 Introduction

Green Investment Group Ltd (GIG) are the new owners of Fuinneamh Sceirde Teoranta (FST) and are progressing the development of the Sceirde Rocks Offshore Wind Farm.

Xodus Group Ltd (Xodus) has prepared this Natura Impact Statement (NIS) on behalf of FST in support of an application for a Foreshore Licence under Section 3 of the Foreshore Act 1933, as amended, to carry out a site investigation campaign within the Foreshore Licence Area of the Sceirde Rocks Offshore Wind Farm. The Foreshore Licence Area of Sceirde Rocks Offshore Wind Farm is set out and described in Figure 1 below.

1.1 Background and Objectives

This NIS is part of the Foreshore Licence Area to the Foreshore Section of the Department of Housing, Local Government and Heritage (DHLGH) and includes information to support the Minister undertaking Appropriate Assessment as required under the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (the "Habitats Regulations"), to ensure compliance with the Habitats Directive (92/43/EEC).

This report provides the necessary information to the competent authority to enable the Minister to determine whether the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm, individually or in combination with other plan or projects, will result in any adverse effects on the integrity of the Special Areas of Conservation (SAC) of Special Protection Areas (SPA), having regard to their conservation objectives and their designated Annex I and Annex II species, screened in during the Stage 1 Appropriate Assessment Screening (see 'Report to Inform Appropriate Assessment Screening' (Document Ref L100725-S00-A-REPT-005) also submitted as part of this licence application).

European Community (EC) Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, commonly known as the Habitats Directive, affords protection to habitats and species of community interest through the designation of a European Union (EU)-wide network of protected sites known collectively as European sites. These sites are Special Areas of Conservation (SAC) designated under the Habitats Directive and Special Protection Areas (SPA) designated under the Birds Directive (Directive 2009/147/EC).

Under Article 6(3) of the Habitats Directive, 'any plan or project which is not directly connected with or necessary to the management of a European site but would be likely to have a significant effect on such a site, either individually or in-combination with other plans and projects, shall be subject to an appropriate assessment of its implications for the European site in view of the site's conservation objectives.' The requirement for Appropriate Assessment was transposed into Irish law inter alia by European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.

For those sites where it cannot be concluded that there will be no LSE, the Minister for Housing, Local Government and Heritage is required to carry out an Appropriate Assessment of the site investigations to ascertain whether or not they would have an adverse effect on the integrity of a European site. Such an Appropriate Assessment would be informed by information provided in a Natura Impact Statement (NIS). This report is that Natura Impact

Statement for the Sceirde Rocks Offshore Wind Farm site investigation activities to provide the necessary information to the Minister to undertake an Appropriate Assessment.

Further information addressing the specific requirements of Article 6(3) of the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 is provided in Section 3 of this report.

1.2 Foreshore Licence Area

This Foreshore Licence Area seeks consent to conduct site investigation activities for the Sceirde Rocks Offshore Wind Farm located approximately 5km off the west coast of Ireland (off the coast of county Galway). Following completion of the site investigations, it is the intention of FST that an application to construct the Sceirde Rocks Offshore Wind Farm will be submitted under the MAP Act 2021.

This Foreshore Licence Area covers the wind farm array area of the Sceirde Rocks Offshore Wind Farm. The Investigative Foreshore Licence Area relevant site area measures 141 km^2.

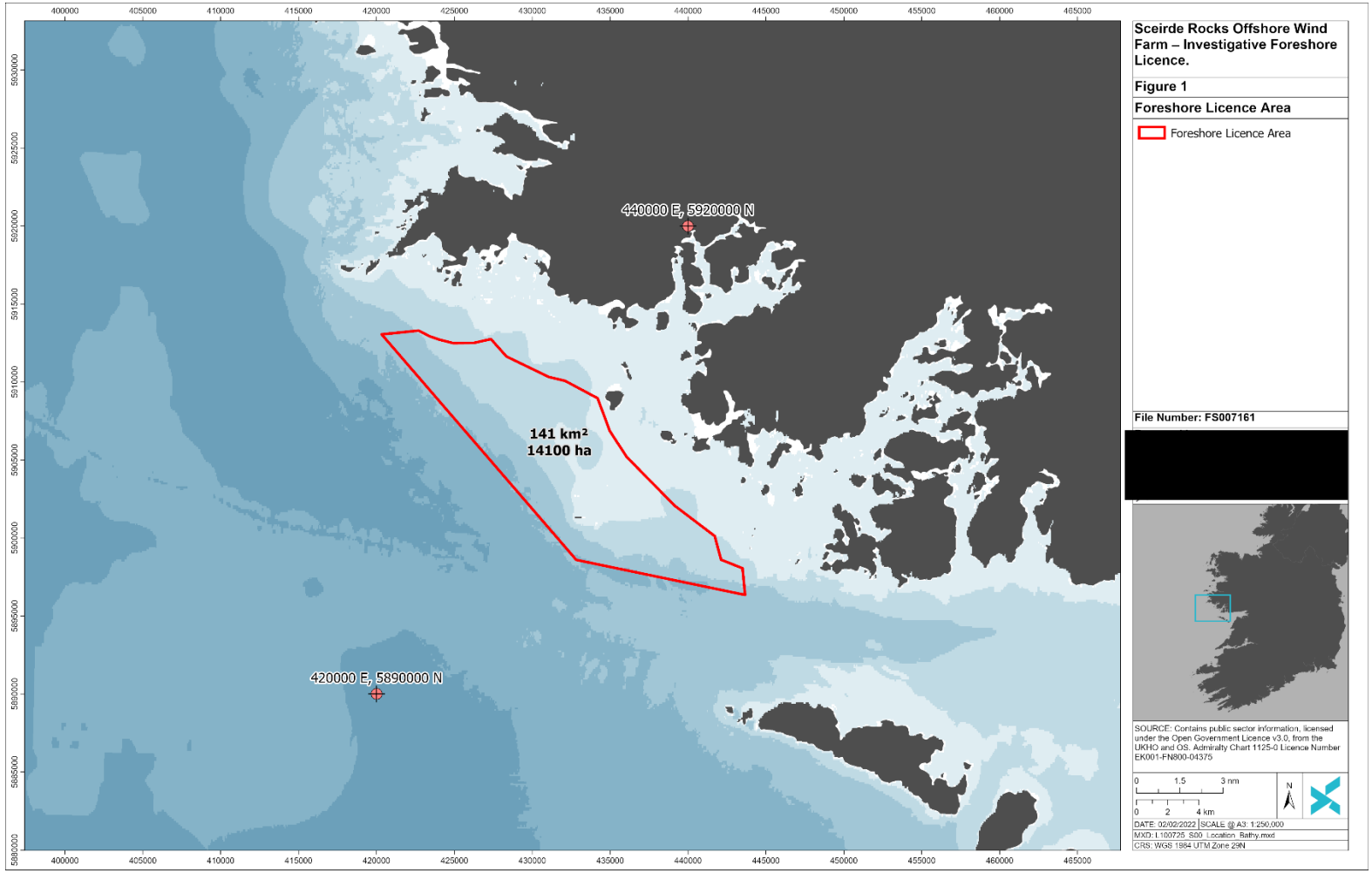

Figure 1 Foreshore Licence Area

1.3 Site Investigation Activities

The objective of the proposed Sceirde Rocks Offshore Wind Farm survey campaign is to determine geotechnical, geophysical, metocean, wind resource and benthic characteristics within the Foreshore Licence Area. The data obtained will provide a greater and more detailed understanding of the existing seabed and sub-seabed conditions within the Foreshore Licence Area. The obtained data and subsequent analysis will be used to engage with stakeholders, inform the design of Sceirde Rocks Offshore Wind Farm and begin the process of preparing the Environmental Impact Assessment Report and the Natura Impact Statement for the Project.

Full details of the scope and methodologies for each type of survey can be found in Section 2. A summary of the proposed surveys is given below in Table 1-1. Following a decision to grant the foreshore licence, it is the intention that surveys will commence as soon as practicably possible with a staged programme of site investigations taking account of suitable weather conditions. It is currently anticipated that surveys will begin in late 2022 or early 2023. It is possible that the investigations may be undertaken simultaneously and this is considered in the assessment provided in Section 4.

The information provided in this report is based on the equipment required and activities undertaken during the site investigations.

Table 1-1 Summary of proposed site investigations

Survey	Methods	Purpose and scope
Geotechnical	Borehole Sampling	Provide geotechnical data to aid with preliminary engineering, foundation design and array layout. Up to 60No. boreholes will be required using Cable Percussive Sampling and/or Rotary Coring techniques (depth of borehole will not exceed 70m).
	Down-hole Acoustic Imaging	Imaging of rock structure within boreholes to determine the nature, orientation and spacing of rock discontinuities and assess zones of core loss.
	Shallow sampling	Shallow sampling (60No. locations) may be used to determine the near surface sediment properties. This could utilise a combination of grab samples, Vibrocores, and gravity cores. These techniques would range from 0.5 to 6m penetration and would extract a shallow sample for further lab testing and visual descriptions.
	Cone Penetration Tests (CPT)	CPTs are used to derive in-situ geotechnical parameters. CPTs will be targeting Quaternary and pre-Quaternary sediments, where present. Up to 60No. CPT locations using Seafloor CPT methodology.
Preliminary bathymetric and geophysical	Contiguous acquisitions	Multi-sensor survey to include some of the following: multibeam echosounder (MBES), side scan sonar (SSS), magnetometer, sub-bottom profiler (SBP) and a seismic survey using Ultra High Resolution Seismic (Boomer/Sparker).

Survey	Methods	Purpose and scope
Metocean	Metocean measurement devices (e.g. Wave buoys)	Up to three metocean measurement devices (for example, wave buoys may be deployed at three different locations covering an extreme case and a site representative case to define wave height and direction).
Wind resource	Floating LiDAR Buoy	Floating LiDAR used to measure the wind resource within the Foreshore Licence Area. Up to two measurement locations considered due to the size of the area.
Benthic Ecology	Drop Down Video/Camera	Drop down video surveys provide visual data on environment epibiota and sediment type, this will be used to provide an overview of the seabed habitat. In addition, dive surveys may be required where a potential reef environment is identified.
	Water Sampling	Used to provide data on suspended sediment concentrations within the water column. This information will be used to inform decisions regarding coastal processes and sediment dynamics assessment. Data will be collected throughout the water column and over different tidal cycles
	Grab Sampling	Used to investigate sediment habitat types and determine physico-chemical characteristics (such as organic content and particle size) and macro-faunal analysis. Grab sampling conducted using 0.1 m^2 day grabs. Up to 40 grab sample stations (using day grab or van Veen grab) will be acquired across the site

1.4 Structure of report

This Report to Inform Appropriate Assessment Screening is presented in the following sections:

Section 1	*Introduction* – provides a background to the Sceirde Rocks Offshore Wind Farm Foreshore Licence Area and the purpose of this report.
Section 2	*Site Investigation Description* – describes the activities of the proposed site investigations.
Section 3	*Approach to Meeting the Requirements of the Habitats Regulations and Habitats Directive* – describes the requirements of the Habitats Directive and the relevant Irish transposing legislation with respect to the site investigations and describes the methodology used.
Section 4	*Appropriate Assessment:* describes the environmental baseline in the context of protected sites, and identifies whether, in view of best scientific knowledge and in view of the conservations objective of the relevant European sites, the site investigation activities individually or in combination with another plan or project will have an adverse effect on the integrity of any European Site
Section 5	*Conclusions*
Section 6	*References*
Appendix A	*Details of SACs determined to have connectivity with the Foreshore Licence Area and site investigations and evaluated in the Appropriate Assessment*

2 PROPOSED SITE INVESTIGATIONS

2.1 Geotechnical Site Investigations

It is currently proposed that geotechnical surveys are phased to account for uncertainty and to allow the preliminary investigation to inform future surveys. Phasing will consist of:

- A preliminary investigation for general ground conditions and potential hazard assessment;
- A main investigation for specific ground conditions; and
- An infill survey covering additional locations or to investigate newly identified hazards.

A foreshore license with a timeline of 5 years is being requested to cover the various surveys and investigation activities needed to advance the project. This phasing is the industry accepted approach to obtaining geotechnical data. It is likely that the main investigation and infill survey phases will be undertaken over several years as the data requirements for the project evolves.

The primary objectives of the geotechnical investigations are to inform the project engineering, consenting requirements and generally reduce project uncertainty with respect to site characterisation. The data collected through these surveys will facilitate decision making on engineering, foundation design and array layout optioneering.

During the geotechnical investigations, included in this foreshore licence application, the following methods (described below in Section 2.1.1, Section 2.1.2 and Section 2.1.4) will be used in collaboration to ensure that a comprehensive understanding of the subsurface environment of the Foreshore Licence Area is obtained.

The preliminary geotechnical sampling may comprise:

- Up to 60No. boreholes, which may include cable percussive or rotary coring techniques, for example. The borehole depths will not exceed 70m;
- Up to 60No. seafloor CPTs undertaken across the site; and
- Shallow sampling (potentially using Vibrocore techniques at up to 60 locations).

At this stage, exact borehole locations within the Foreshore Licence Area are not known and will be confirmed following appointment of a suitable qualified survey contractor. Borehole locations will be chosen to obtain site-wide coverage and will be determined based on the best locations to help define geological boundaries and obtain samples in all the anticipated geological units. Final borehole locations and CPT locations can be provided to the Department of Housing, Local Government and Heritage prior to survey mobilisation if requested.

2.1.1 Borehole Sampling

The geotechnical surveys will be performed at various water depths by either a Dynamic Positioning (DP) controlled and heave-compensated drillship, a Jack-up vessel, or by means of seabed drilling equipment.

Vessels will be fully equipped with ultra-short baseline (USBL) system for accurate positioning of boreholes. Vessel selection will depend on the water depth, environmental conditions and seabed soils. At this stage, the potential for challenging seabed conditions means that a jack up vessel may be required. The survey methodology will comprise a combination of drilling techniques, such as cable percussive drilling, with follow-on rotary coring techniques. The boreholes will provide in-situ information on sediment and rock type and distribution and provide samples for laboratory testing. The data collection will support decision making on engineering, foundation design and array layout optioneering.

2.1.1.1 Cable Percussive Drilling

Cable percussive drilling is one drilling technique to target seabed and sub-seabed sediments which overlie rock. This includes coarse-grained sediments such as sand and gravel, and fine-grained sediments such as clay and silt. Casing will be utilised to stabilise the borehole walls through the superficial sediments.

Within coarse-grained sediments, percussive sampling, such as hammer samples, will be undertaken at regular intervals. In-situ standard penetration testing (SPT) will also be undertaken, generally alternating with percussive sampling. Bulk-disturbed and small-disturbed samples will be undertaken, where appropriate.

Within fine-grained sediments, hammer or push samples will be undertaken at regular intervals, alternating with SPT testing. Undisturbed, bulk disturbed and small disturbed samples are anticipated to be taken to enable a range of laboratory tests.

Samples will be appropriately preserved and stored prior to transportation to onshore laboratories for geotechnical testing. An offshore laboratory will also be provided on the vessel to enable classification and index testing to be undertaken, along with preliminary core and sample logging.

2.1.1.2 Rotary Coring Techniques

Rotary coring is anticipated to comprise double or triple-tubed coring depending on the nature of the rock. The drilling operations typically utilise a drilling fluid to help flush drill cuttings from the bore, cool the drill bit and generally aid drilling performance; drilling fluids are typically certified for offshore use and may comprise biodegradable, miscible guar gum, or similar, and seawater.

The retrieved core is anticipated to be approximately 100mm in diameter but may potentially be reduced to 70mm. The majority of the underlying rocks are anticipated to be high-strength granitoid rocks, with minor zones of limestone around the southern margin.

The extracted rock core will be photographed, logged and sub-sampled offshore. Samples will be appropriately preserved and stored prior to transportation to onshore laboratories for geotechnical testing. Classification and index testing of the rock to be undertaken in the offshore laboratory.

2.1.2 Down-hole Testing including Acoustic Imaging

It is anticipated that some level of down-hole testing may be undertaken which could include video imaging, acoustic imaging, dilatometer testing, etc... For example, the purpose of down-hole acoustic imaging is to provide an image of the rock structure to determine the nature, orientation and spacing of any rock discontinuities within the Foreshore Licence Area.

The process involves sending an acoustic imaging camera down the borehole, which takes a 360° image of the rock face. This can show features such as voids or fractures and can also give an indication of the orientation of discontinuities. This is important for understanding the in-situ fracture spacing and orientation of beds, which can then be used to develop three-dimensional models of the rock. The images can also be used to assess zones of core loss and adjust borehole logs accordingly.

Acoustic imaging requires a stable borehole and therefore requires casing through unstable surficial sediments and extension of casing to support deeper unstable zones. Acoustic imaging cannot be undertaken through the cased section of a borehole and therefore the strategy for performing the survey may require modification based on the general nature of the rock encountered.

2.1.3 Shallow Sampling (eg. Vibrocores)

Shallow sampling may be used to determine the near surface sediment properties. This could utilise a combination of grab samples, Vibrocores, and gravity cores for example. These techniques would range from 0.5 to 6m penetration and would extract a shallow sample for further lab testing and visual descriptions.

2.1.4 Cone Penetration Tests (CPT)

Seabed CPTs consist of a self-contained and automated CPT test unit, housed within a seabed frame and connected to the DP vessel via a lift wire and data transfer umbilical. The frame is kept on deck of the DP vessel and deployed over the side using a dedicated Launch Recovery System (LARS) or through a moonpool. Once positioned on the seafloor, the cone is pushed at a constant rate into the seabed until either target penetration is achieved or refusal reached. Refusal may be due to maximum thrust reached, excessive load experience on the tip or the sleeve, or excessive cone inclination.

The configuration of the CPT unit used for the preliminary survey will be defined by the target penetration depth. The maximum penetration depth anticipated for this Foreshore Licence Area is circa 50m, however final selection of the CPT unit will be determined on the basis of sediment thicknesses estimated from the geophysical survey data. This preliminary depth places this CPT site investigation within the category of deep seabed CPT testing, which would require a 20 to 25 tonne CPT unit. CPT testing to this sort of depth takes a few hours from unit deployment to recovery back on deck. Where the technical requirements are not met at a location, the CPT unit may be lifted a small distance from the seabed and repositioned horizontally so that another test can be attempted.

2.1.5 USBL Specification and Use

USBL systems are used to determine the position of subsea survey items, including Remotely Operated Vehicles (ROVs), towed devices, grab samplers, etc. This involves the emission of sound from a vessel-mounted transducer to a subsea transponder, thereby introducing sound into the marine environment. A USBL system consists of a transducer, which is mounted on the vessel and a transponder attached to the ROV. The transducer transmits acoustics through the water and the transponder sends a response which is detected by the transducer. The USBL calculates the bearing and time taken for the transmissions to be completed and thus the position of the subsea unit / sampling equipment is determined. These systems can either be used continuously or intermittently through the operation they are supporting.

The survey vessel will visit each individual borehole location in turn. Accurate positioning of the boreholes will be achieved using an ultra-short baseline (USBL) system. These systems include a transceiver which is mounted on the hull of the survey vessel and a transponder or beacon which will be mounted on the seabed frame during deployment. Transponders emit pulses of medium frequency sound. The peak sound pressure level (SPL) was estimated as 207 dB re 1 µPa at 1 m for the Kongsberg HiPap 500 (Austin *et al.*, 2012).

Transmissions are not continuous but consist of short 'chirps' with a duration that ranges from 3 to 40 milliseconds. Transponders will not emit any sound when on standby. For general positioning and when lowering the seabed frame, they will emit one chirp every five seconds. When required for precise positioning, they will emit one chirp every second. Use of the USBL and beacon is expected to take from a few minutes to 1.5 hours per station depending on the water depth. Once the seabed frame is on the seabed, stationary and a final fix has been recorded, the USBL will be turned off.

2.1.6 Coring Fluids and Discharges

Borehole coring may be conducted with seawater only, with no added chemicals. It is possible that coring fluids may be used when required. The most likely fluid in this case would be an organic, biodegradable, high performance water-based mud (HPWBM). Bentonite will also be carried onboard in case it is needed and this may sometimes be mixed with soda ash. All proposed coring fluid products are rated as PLONOR (posing little or no risk to the environment) and contain only OCNS Gold/Silver, E or D rated chemicals. Final details of the coring fluids to be used will be known upon appointment of the survey contractor.

Only minimal amounts of cuttings will be discharged because 80 - 90% of the core is recovered for analysis. Cuttings are discharged and will settle close to the seabed and are estimated to amount to <0.25 m^3 per borehole.

2.1.7 Summary

Activity	Activity time	Total number of SI locations	Total SI duration	Footprint per SI location [m^2]	Total SI footprint [m^2]	Affected area as a % of the foreshore license area
Borehole	48 – 96 hours per location	60	1 – 2 months over several phases over a 5 year window	1 – 2	60 – 120	8.5e-5%
Jack up vessel	-	60	-	20	1200	8.5e-4%
CPT	2 – 6 hours per location	60	1 – 2 months over several phases over a 5 year window	4-8	240-480	3.4e-4%
Shallow sampling	3 hours per location	60	1 – 2 months over several phases over a 5 year window	0.1	6	4.3e-6%

2.2 Geophysical Survey Investigations

The proposed geophysical survey programme involves a multi-disciplinary approach that is designed to acquire a full suite of data which includes a multibeam echosounder, side scan sonar, magnetometer, sub-bottom profiler and a seismic survey using a slightly higher energy source (only if sufficient depth data cannot be obtained using the sub-bottom profiler). The collected data will be used to better understand the water depths, topography and relief structure of the seabed and the subsurface structure, in particular the sub-surface stratigraphy, determining sediment strata and the elevation of competent bedrock. To inform the suitability of a cable corridor area, understanding the top ~5m is crucial. The process is non-intrusive and at no point will the equipment used make contact with the seafloor. The exact equipment to be used will be confirmed following a tender process to procure the site investigation contractor however the operating frequencies outlined in Table 1-4 represent the operating frequencies employed in site investigations for offshore wind.

The objectives of the geophysical survey shall be:

- To obtain up to date high-resolution water depth measurements across the site;
- To obtain information on the seabed surface (type, texture, variability, etc.) and in particular, to identify any seabed features that may be of interest to the overall project;
- Identify any shallow geohazards and man-made hazards (including but not limited to outcropping rock, boulders, shallow gas, wrecks, debris etc.);
- Determine the stratigraphy across the site and quantify the variability in the lateral and vertical extents to depths greater than foundation depth, if necessary;
- Identify the presence of bedrock within the site boundary and the thickness of the overburden deposits;
- Identify any magnetic anomalies;
- Identify marine habitat areas as the basis for a benthic survey to be carried out;
- Identify sensitive marine habitats which will need to be avoided during geotechnical and environmental sampling.
- Provide information for identification of archaeological targets.

During the geophysical investigations, included in this foreshore licence application, the following methods (described below in Sections 2.2.1, 2.2.2, 2.2.3, 2.2.4 and 2.2.5) will be used in collaboration to ensure that a comprehensive understanding of the subsurface environment of the Foreshore Licence Area is obtained.

2.2.1 Multibeam Echosounder (MBES)

A Multibeam Echosounder (MBES) system will be used to provide detailed bathymetric mapping throughout the survey area.

MBES dual head system will be hull mounted. The exact equipment used will be confirmed following the appointment of a survey contractor. The R2 Sonic 2024 or the Kongsberg EM2040 may be taken as a example (Plate 1). Operating frequencies for offshore wind are in the regions of 200kHz (minimum) and can be up to 700kHz.

MBES is non-intrusive therefore does not interact with the sea floor. MBES may be undertaken across the site to a suitable percentage coverage.

Plate 1 Multibeam Echosounder (EM2040)

2.2.2 Side Scan Sonar (SSS)

Side Scan Sonar (SSS) is a towed sensor which is towed behind the vessel on an armoured tow cable, although some models can be pole mounted on the side of the vessel. SSS will be a dual frequency hydrographic sonar used to produce seabed imagery. A Side Scan Sonar (SSS) system will be used to provide detailed imagery of the seabed throughout the survey area which will aid with seafloor sediment/bedrock and geomorphology mapping as well as for identifying any shallow geohazards.

Side scan systems are available from a number of manufacturers. These units vary in size, working and technical characteristics and acquisition configuration (towed or vessel mounted). Presently, dual frequency digital systems are available in the market which allows more survey flexibility; some systems can acquire and record both frequencies swaths independently and simultaneously. Using these systems, operator may use a higher frequency to produce sharper images and narrow swath or use the lower frequencies to obtain wider seabed coverage at lower resolutions. The exact equipment used will be confirmed following the appointment of a survey contractor. The operating frequency range for offshore wind purposes is between 300 to 900 kHz.

The system will be adequate to the depth range of the study area and the seabed discrimination level required. The design of transects will consider the geographic and depth extent of the study area, seabed coverage ratio, overlap coverage desired, priority areas to survey, prevailing winds and currents, etc. Often, the complete coverage of the seabed is the ultimate goal of an acoustic survey design, to enable the creation of full mosaics. In these cases, theoretically, parallel transects should be run to produce up to 100% ensonification of the seafloor. When complete coverage is not necessary to define seabed boundaries, consecutive swaths may not overlap can be adequate. However, in some cases, transect spacing of is less than the swath width can provide reasonable overlapping to compensate any loss in data quality at the outer range limits. This is very dependable on metocean conditions and the survey will be planned accordingly by an experienced survey team.

SSS is non-intrusive therefore does not interact with the seafloor. SSS may be undertaken across the site to a suitable percentage coverage.

Plate 2 Example of a Towable Side Scan Sonar Data Device (EdgeTech)

2.2.3 Magnetometer

A magnetometer is a passive device that is towed behind a survey vessel. It is used to detect ferrous objects on the surface or in the subsurface. Magnetometer surveys are widely used prior to intrusive works to highlight any obstruction or potential risk such as existing infrastructure, shipwrecks and unexploded ordnance.

The vessel will tow a submerged pod (Magnetometer) piggy-backed to the side scan sonar. The exact equipment used will be confirmed following the appointment of a survey contractor. The marine magnetometer will be of the Caesium Vapour type and capable of recording variations in magnetic field strength during survey to an accuracy of ±0.5nT.

A Magnetometer is non-intrusive therefore does not interact with the sea floor. It may be undertaken across the site to a suitable percentage coverage and the parameters of the survey may be determined by the requirements of the Underwater Archaeology Unit of the National Monuments Service. Their requirements are set out in Table 1-2

Table 1-2 Underwater Archaeology Unit Requirements for Magnetometer Survey

Activity	Requirements for Archaeological Purposes
Side Scan Sonar	• Operational frequency of 200 to 700kHz. • 50m survey line spacing • 100% site coverage (overlap of areas may be required)
Magnetometer	• Caesium or proton magnetometer • 50m side spacing

Plate 3 Magnetometer Example (Geometrics)

2.2.4 Sub-Bottom Profiling (SBP)

Shallow Sub-Bottom Profiling aims to create a 2-D image of the subsurface up to potential depths of approximately 10-50 m below seabed, depending on the geological conditions encountered and the choice of system used greater penetration can be achieved. Different types of SBP are available including chirp, pinger and parametric chirp systems. The most appropriate system will be decided depending on the seabed, anticipated geological environment and the objectives of the survey.

A Sub-Bottom Profiling (SBP) system may be used to determine the stratigraphy across the site and quantify the variability in the lateral and vertical extents to a depth of at least 50m below seabed.

The Seatronics Edgetech 3300 may be taken as an indicative example of a hull-mounted pinger system and would have an expected operating frequency range of approximately 2-16 kHz with sound pressure levels of 200dB re1µPa at 1 metre range. This survey is non-intrusive therefore does not interact with the sea floor. It may be undertaken across the site to a suitable percentage coverage.

Plate 4 Example of Boomer Sub-Bottom Profiler

Plate 5 Example of Pinger Sub-Bottom Profiler

2.2.5 Ultra High Resolution Seismic

Higher energy seismic sources (boomer and sparker) may be used to determine the stratigraphy across the site and quantify the variability in the lateral and vertical extents to a depth of at least 50m below seabed, depending on the geological conditions encountered and the choice of system used greater penetration can be achieved.

The Applied Acoustics may be taken as an indicative example of a boomer source and would have an expected operating frequency of approximately 2.5 kHz with sound pressure levels in the range of 208-215dB re1µPa at 1 metre range. The Geo-Source 200 or the Applied Acoustics Squid 500 may be taken as an indicative example of a towed sparker system, with sound pressure levels in the range of 204-216dB.

Multi-channel acoustic surveys using higher energy sources are used to image the subsurface and categorise sediment strata. These surveys can create ultra-high resolution 2D or 3D images of the subsurface whilst achieving greater depths than sub-bottom profiling systems. The intensity of the source can vary depending on the requirements of the survey. These surveys will only be used if sufficient depth data is not achieved with the use of the SBP method in Section 2.2.4.

This survey is non-intrusive therefore does not interact with the seafloor. It may be undertaken across the site to a suitable percentage coverage.

Plate 6 Example of Sparker sub-bottom profiler

2.2.6 Summary

Activity	Activity time	Coverage	Total SI duration
Bathymetric and Geophysical surveys	2-3 months	100%	2-3 months of activity in different phases over the 5 year licence period

2.3 Metocean Site Investigations

Metocean site investigations are necessary to evaluate the wave and current conditions across the Foreshore Licence Area. The data will be used to help define the design parameters of the Sceirde Rocks Offshore Wind Farm foundations, as well as the conditions to be expected during the installation and maintenance of the project. The site investigations will require the use of two wave buoys with a minimum 12 month but possibly up to 24 month measuring campaign to reduce the uncertainty of the final metocean assessment.

2.3.1 Metocean Measurement Devices (e.g. Wave Buoys)

Metocean site investigation will require the installation of up to three metocean devices, such as wave buoys. Wave buoys are designed to follow movement at the water surface and gather the relevant wave data. Each wave buoy is anchored to the sea floor using a length of highly elastic rubber chord and suitably sized anchor structure. The elasticity of this chord allows the buoy to ride and follow the movement of the water surface. A real time data feed with a GSM and satellite communication system transmits the collected data from the buoy to a receiver station onshore. The wave buoy specifications include: an LED light for detection, an integrated datalogger for backup data storage, GPS position, a solar powered battery and an internal backup battery pack.

At this stage, exact locations of the metocean devices within the Foreshore Licence Area are not known and will be confirmed following appointment of a suitable qualified survey contractor. Final device locations can be provided to the Department of Housing, Local Government and Heritage prior to survey mobilisation if requested.

The data to be collected from the metocean site investigations of the Foreshore Licence Area include:

- Location (latitude, longitude)
- Significant wave height (Hs)
- Maximum wave height (Hmax)
- Peak wave period (Tp)
- Mean wave period (Tz)
- Wave direction
- Directional spreading
- Sea temperature

2.3.2 Survey Summary

Activity	Activity time	Total number of SI locations	Total SI duration	SI affected footprint [m^2]	Total footprint [m^2]	Affected area as proportion of the foreshore license area
Metocean Measurement Devices	12 – 24 months per location	3	12 – 24 months	10	20	1.4e-5%

2.4 Wind Resource Site Investigations

Wind resource measurements are required to accurately estimate the wind conditions across the Sceirde Rocks Offshore Wind Farm site. The data collected will be used to assess the energy production from the wind farm including daily and seasonal patterns. The wind data is also used as one of the inputs for the engineering design of the wind turbine, turbine layout and foundation structures.

The wind resource measurement campaign will last a minimum of 12 months but could last more than 24 months (depending on project development programme) in order to gather more data to reduce uncertainty of the future wind resource and energy yield estimates, as well as to provide contingency for any unforeseen issues with data measurements.

2.4.1 Proposed wind resource measurement campaign locations

It is expected that up to two wind measurement locations (using floating LiDAR) will be situated within the Foreshore Licence Area. At this stage, exact deployment locations of the floating LiDAR devices within the Foreshore Licence Area are not known and will be confirmed following appointment of a suitable qualified survey contractor. Final device locations can be provided to the Department of Housing, Local Government and Heritage prior to survey mobilisation if requested

2.4.2 Floating LiDAR systems

A floating LiDAR system (FLS) is usually a small (2 m to 3 m across) buoy moored using a gravity anchor. It houses a LiDAR (Light Detection And Ranging) device which uses laser to measure wind speed and direction at a range of heights, up to 100 m to 200 m above the device. The buoy also houses all the necessary processing equipment, power supply systems (solar panels, small scale wind turbine generators, and batteries), additional measurement systems required for the data monitoring (such as key metocean and atmospheric characteristics), as well as auxiliary systems for marine navigation safety. The data is stored on the device, as well as uploaded to a remote storage via a GSM or satellite link.

There are several FLS providers, and the final design used for the measurement campaign at Sceirde Rocks Offshore Wind Farm will be known following appointment of the survey contractor. FLS would be deployed, serviced, and decommissioned using an installation vessel.

Two FLS buoys will be deployed in the Foreshore Licence Area in order to improve the accuracy of the wind resource estimates, as well as provide additional contingency should one of the devices experience any issues.

2.4.3 Summary

Activity	Activity time	Total number of SI locations	Total SI duration	SI affected footprint [m^2]	Total footprint [m^2]	Affected area as proportion of the foreshore license area
Floating LiDAR system	12 – 24 months per location	2	12 – 24 months	10	20	1.4e-5%

2.5 Benthic Ecology Site Investigations

The purpose of the benthic ecology site investigations is to identify the extent and distribution of marine benthic communities and habitats within the Foreshore Licence Area.

At this stage, exact benthic sample locations within the Foreshore Licence Area are not known and will be confirmed following appointment of a suitable qualified survey contractor. The sample locations will be selected to ensure that samples are collected from different habitats to generate a representative overview of the Foreshore Licence Area benthic habitat. Final benthic sample locations can be provided to the Department of Housing, Local Government and Heritage prior to survey mobilisation if requested.

The survey data acquisition for assessing benthic ecology and sediment dynamics will include drop down camera/Remotely Operated Vehicle (ROV), water column sampling and grab sampling.

An indicative overview of the habitats encountered across the proposed project site can be determined from the offshore component of the adjacent Kilkieran Bay and Islands SAC. The expected habitats may include:

- Sediment dominated communities.
- Subtidal reef communities of varying exposures; and
- Intertidal reef communities (associated with rocky outcrops within the project site).

Of these, it is the sediment dominated communities present within the Foreshore Licence Area that will be subject to the benthic grab sampling regime. While there is expected to be subtidal rocky/stony substrata across the area, the exact positions of these will be confirmed from analysis of geophysical data prior to final selection of the benthic sampling locations. Where a benthic grab sample station is confirmed to be rocky substrata, only drop down camera/ROV visual data will be acquired for habitat assessment (possibly supplemented by diver survey in littoral zone).

It is proposed that up to 40 grab sample stations (using day grab or van Veen grab) will be acquired across the site. The proposed benthic grab sample stations will coincide with the proposed geotechnical borehole locations outlined in Section 2.1, with additional benthic stations selected to fill in gaps to ensure a comprehensive coverage of the habitats present, which will capture the range of depths and exposures. It is expected that the seabed will be comprised of mixed sediments which may range from pebbles, gravels to finer sands which will be determined by the acoustic data acquisition. A stratified random sampling regime across the Foreshore Licence Area has been adopted to determine the baseline environment.

The number of sample stations has been selected in order to ensure that sampling is representative and sufficient and that any species that occur in low densities or are locally rare are identified.

The benthic sampling acquisition will include up to 4 replicate grabs at each station. Three replicates will be used for macro-faunal analysis, and the fourth will be sub-sampled for physico-chemical analysis (i.e. Particle size analysis (PSA) and organic content). The replication of samples is proposed to provide a statistically robust macro-faunal data set to inform the environmental baseline and future monitoring.

Assuming all grab stations are acquired, a total of up to 160 grabs would be taken, each disturbing an area of 0.1 m^2. Therefore, the total area of seabed that would be directly affected by the gab sampling regime will be 16 m^2.

In any case where benthic sampling is not possible, drop down video/camera analysis would be sufficient to establish the benthic ecology present.

2.5.1 Summary

Activity	Activity time	Total number of SI locations	Total SI duration	SI affected footprint [m^2]	Total footprint [m^2]	Affected area as proportion of the foreshore license area
Benthic grab sample	3 hours per location	40 (x 4 grabs at each location = 160 grabs)	2-3 weeks	0.1	16	1.1e-5%

2.6 Survey Vessels

Each of the proposed site investigation surveys included in this foreshore licence application will require the use of a small number of vessels for the efficient deployment, execution and recovery of the site investigation activities. Given the nature of the survey activities, all vessels will be slow moving.

The survey contractor vessels will comply with international and national statute as appropriate including but not limited to:

- Sea Pollution Act 1991 and International Convention for the Prevention of Marine Pollution from Ships (MARPOL 73/78);
- Sea Pollution (Amendment) Act 1999 and International Convention on Oil Pollution Preparedness, Response and Co-operation 1990;
- S.I No. 372/2012 Sea Pollution (Prevention of Pollution by Garbage from Ships) Regulations 2012;
- S.I. No. 492/2012 Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2012; and
- SI. No. 507/2012 Merchant Shipping (Collision Regulations) (Ships and Water-Craft on the Water) Order 2012

The largest vessel to be used is the geotechnical survey vessel. Indicative parameters are provided in Table 1-3.

Table 1-3 Geotechnical investigation vessel indicative parameters

PARATMETER	VALUE
Registered tonnage	5,400 – 7,000 tonnes
Length	80-110m
Breadth	20-25m

PARATMETER	VALUE
Draft	6-8m

2.7 Noise Sources From Survey Works

The range of likely noise frequency and sound pressure associated with the survey methodologies identified in this document is summarised in Table 1-4 below.

Noise emissions associated with the survey vessels are continuous in nature. Use of a DP system constitutes the greatest noise source for this type of vessel. Hartkin *et al.* (2011) found that source pressure levels reached a maximum of 170 dB within 1 m of the thrustors, whilst the vessel was on DP.

Source noise levels for rotary coring of 165dB re 1µpa @1 m (Subacoustech Environmental Ltd, 2018) and source noise levels for percussive drilling of 185dB re 1µpa @1 m (Subacoustech Environmental Ltd, 2018).

Details of the exact equipment to be used will not be known until completion of survey contractor procurement, however the ranges provided below in Table 1-4 are considered applicable for consideration of potential impacts on the environment which is presented in the following documents also submitted with this foreshore licence application:

- Report to inform Appropriate Assessment Screening; and
- Environmental Assessment and Environmental Impact Assessment Screening Report (including Annex IV species risk assessment.

Table 1-4 Summary of Indicative Survey Methodology Operating Sound Pressures

Noise source	frequency	sound pressure level (db re 1µpa @1 m)
USBL	19.5 – 33.5 kHz	207
Geotechnical Drilling	2 Hz – 50 kHz	160-185
Shipping Noise	<1kHz	160 – 185
Multi-beam echo sounder	200 – 700 kHz	200 – 228
Side scan sonar	300 – 900 kHz	228
SBP (Pinger, Chirp, Parametric)	2-16 kHz	200-226
UHRS (Sparker/Boomer)	2.5 kHz	204-216 / 208-215

2.8 Timeline For Site Investigations and Summary

Following grant of the foreshore licence, it is the intention that surveys will commence as soon as practicably possible with a stage programme of site investigations taking account of suitable weather conditions. It is currently anticipated that surveys will begin in late 2022 or early 2023. A foreshore license with a timeline of 5 years is being requested to cover the various surveys and investigation activities needed to advance the project which may take place within the licence period.

3 APPROACH TO MEETING THE REQUIREMENTS OF THE HABITATS REGULATIONS AND THE HABITATS DIRECTIVE (92/43/EEC)

This section of the report summarises the requirements of the Habitats Directive (specifically in terms of Article 6) and the relevant Irish transposing legislation with respect to the site investigation activities.

3.1 Overview of the Habitats Directive and Transposing Legislation

European Community (EC) Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, commonly known as the Habitats Directive, was established by the EC to meet its obligations under the 1979 Convention on the Conservation of European Wildlife and Natural Habitats, commonly known as the Bern Convention, and to complement the provisions of the already established EC Directive 79/409/EEC on the conservation of wild birds (now replaced by EC Directive 2009/147/EC). The main aim of the Habitats Directive is to 'contribute towards ensuring biodiversity through the conservation of natural habitats of wild fauna and flora' by way of actions taken to 'maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna and flora of Community interest'. Habitats and species of Community interest are defined in a number of Annexes of both the Habitats and Birds Directives.

As part of the Habitats and Birds Directives, protection must be afforded to appropriate sites to assist in fulfilling the aims of the Directives. Specifically, SACs must be designated under the Habitats Directive for habitats and species listed on Annex I and Annex II of the Habitats Directive, whilst under the Birds Directive, SPAs must be designated for species listed on Annex I of the Directive. Collectively, these sites are referred to as European sites.

The Habitats Directive and the Birds Directive have been transposed into Irish law inter alia by the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021.

3.2 Article 6 Obligations

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European site and if it cannot be excluded, on the basis of objective scientific information, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site. Article 7 of the Habitats Directive makes the provisions of Article 6(3) applicable to European sites designated under the Birds Directive (i.e. SPAs).

The Habitats Directive applies the precautionary principle to European sites, and projects can only be permitted when it is ascertained that there will be no adverse effect on the integrity of the site(s) in question. Where adverse effects on integrity are identified, a project may only be permitted in the absence of alternative solutions if there is an Imperative Reason of Overriding Public Interest for the project to go head. Where this is the case, Member States are required to take all compensatory measures necessary to ensure that the overall coherence of the European network is protected.

The approach to meeting Article 6 obligations for the Sceirde Rocks site investigations is described below. It complies with with Article 6 of the Habitats Directive, European and Irish Case Law, the requirements of The European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 and is in accordance best practice guidance, e.g.:

- The Department of Environment, Heritage and Local Government, DEHLG, 2010 guidance on Appropriate Assessment of Plans and Projects in Ireland;
- The EC guidance document "Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC" (EC, 2002);
- Commission notice C (2018) 7621 "Managing Natura 2000 sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC" (EC, 2018); and
- Commission notice (2021) "Guidance document on the strict protection of animal species of Community Interest under the Habitats Directive".

3.3 Appropriate Assessment Screening

Since the site investigations proposed are not directly connected with or necessary to the management of the site as a European site, it was necessary to carry out Appropriate Assessment Screening to identify whether, on the basis of objective scientific information, the site investigations individually or in combination with other plans or projects will have a significant effect on a European site. As defined in the regulations, this included consideration of:

- a candidate site of Community importance;
- a site of Community importance;
- a candidate special area of conservation;
- a special area of conservation;
- a candidate special protection area; or
- a special protection area..

Appropriate Assessment Screening was based on a consideration of associated European sites and their respective qualifying interests in a phased process based on:

- Identifying the range of impacts that the site investigation activities could have on qualifying interest(s) of a site (impact pathways).
- Determining connectivity with European sites based on:
  - Evidence that qualifying interest(s) that could be adversely affected by the site investigation activities were present in the site investigation activities zone of impact and likely use of the area (e.g. for foraging and breeding);
  - Whether there is connectivity between the site investigation activities and the qualifying interests of a European site based on:
    1. Foraging distances from breeding colonies (seabirds) (e.g. Thaxter *et al.*, 2012);
    2. Proximity to foraging and breeding sites (marine mammals and fish);
    3. Migration routes (migratory wildfowl, marine mammals and fish);

4. Influence of tidal flow/sediment dynamics on benthic/intertidal Annex I habitats; and
5. Indirect connectivity with other qualifying interests (e.g. fresh-water pearl mussel due to life cycle ecology of salmonids); and

- Whether that qualifying interest(s) would, by virtue of its behavioural and foraging characteristics, be affected by a particular impact (species sensitivity).

- Evaluation of potential for likely significant effects
  - Where impact pathways and connectivity with European sites were identified, further evaluation was undertaken to determine whether, in view of best scientific knowledge and the conservations objectives of the European site, the site investigation activities, individually or in combination with another plan or project is likely to have a significant effect on those European sites.
  - In light of recent case law interpreting Article 6(3) of the Habitats Directive (Case C-323/17) of the Court of Justice of the European Union, which determined that it is not appropriate to take into account measures intended to avoid or reduce the harmful effects of a plan or project on the European site concerned (mitigation measures) at the Appropriate Assessment Screening stage, mitigation measures were not taken into account in the Appropriate Assessment Screening.

3.3.1 AA Screening Outcome

The 'Report to Inform Appropriate Assessment' (Document Reference L100725-S00-A-REPT-005), produced and submitted with this licence application, presents a screening assessment of the proposed Sceirde Rocks Offshore Wind Farm site investigation activities (as applied for in this Foreshore Licence Area) in accordance with the requirements of Regulation 42 of the Habitats Regulations. Its purpose is to assist the Minister in determining whether, in view of best scientific knowledge, there is potential for the site investigations, individually or in combination with another plan or project, to have a Likely Significant Effect (LSE) on a European site (i.e. SAC or SPA, including draft, candidate and proposed sites).

Based on the best scientific knowledge and evidence provided, the only source of impact from the site investigations that had a pathway with connectivity to the European sites identified was the generation of underwater noise and potential impacts on marine mammals.

In the absence of mitigation, all of the survey equipment modelled were determined to have the potential to cause injury and disturbance to harbour porpoise, bottlenose dolphin, grey seal and harbour seal therefore the potential for likely significant effect could not be ruled out. The following SACs (and qualifying interests) were screened in for Stage 2 Appropriate Assessment to consider the likely significant effect from injury and disturbance impacts from the use of geophysical survey equipment:

Table 3-1 SACs, and qualifying interests, screened in for Appropriate Assessment

SITE NAME (SAC)	QUALIFYING INTEREST			
	Harbour porpoise	Bottlenose dolphin	Harbour seal	Grey seal
Blasket Islands	Y	-	-	Y

SITE NAME (SAC)	QUALIFYING INTEREST			
	Harbour porpoise	Bottlenose dolphin	Harbour seal	Grey seal
Duvillaun Islands	-	-	-	Y
Galway Bay Complex	-	-	Y	-
Inishbofin and Inishshark	-	-	-	Y
Inishkea Islands	-	-	-	Y
Kilkieran Bay and Islands	-	-	Y	-
Roaringwater Bay and Islands	Y	-	-	Y
Slieve Tooey/Tormore Island/Loughros Beg Bay	-	-	-	Y
Slyne Head Islands	-	Y	-	Y
Slyne Head Peninsula	-	Y	-	-
West Connacht Coast	-	Y	-	-

Section 4 of this NIS presents the required information to the Minister to enable him to determine whether in view of best scientific knowledge and the conservations objectives of the European sites, the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm, individually or in combination with another plan or project, will have an adverse effect on the integrity of the European sites listed above in Table 3-1. Of the sites listed above in Table 3-1, those within the immediate vicinity of the Foreshore Licence Area are labelled on Figure 2 below).

Figure 2 SACs within the immediate vicinity of the Foreshore Licence Area with connectivity to the Foreshore Licence Area

4 SUPPORTING INFORMATION FOR A STAGE 2 APPROPRIATE ASSESSMENT

4.1 Introduction

The impact of the site investigation activities to be considered in this assessment is injury and disturbance to harbour porpoise, bottlenose dolphin, grey seal and harbour seal (the qualifying interests of the SACs screened in for Appropriate Assessment in Table 3-1) due to underwater noise primarily from the geophysical survey equipment.

Importantly, this impact was screened in for Appropriate Assessment as a result of mitigation not being considered in the screening process in line with recent case law interpreting Article 6(3) of the Habitats Directive (Case C-323/17) of the Court of Justice of the European Union, which determined that it is not appropriate to take into account measures intended to avoid or reduce the harmful effects of a plan or project on a European site, at AA screening stage. The absence of the consideration of mitigation measures meant that likely significant effect could not be ruled out at AA screening stage. In this Appropriate Assessment, the mitigation measures, as outlined in Section 4.2, have been considered in determining whether the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm will have an adverse effect on the integrity of the European sites, having regard to the conservation objectives of the qualifying interests.

The conservation objectives for all SACs, and relevant qualifying interests, screened in for Stage 2 Appropriate Assessment, and considered in this NIS, are presented in Appendix A of this NIS.

4.2 Mitigation Measures

Due to the potential for injury to harbour porpoise, bottlenose dolphin, grey seal and harbour seal resulting from the site investigations, marine mammal mitigation will be implemented. Available mitigation measures specifically designed for geophysical surveys have been incorporated into the mitigation measures described below and the protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (Department of Arts, Heritage and the Gaeltacht (DAHG), 2014) will be followed at all times for all site investigation activities. Section 4.3.4 of the DAHG 2014 guidance specifically relates to geophysical survey activities. These best practice guidelines are now incorporated as standard operating procedures for all noise emitting surveys in Irish Waters and are considered sufficient by the competent authority (National Parks and Wildlife Service (NPWS)) to mitigate for disturbance to marine mammal species.

4.2.1 Marine Mammal Monitoring

There will be a qualified Marine Mammal Observer (MMO) appointed to monitor for marine mammals and to log all relevant events using the required data forms provided by DAHG. Particular attention will be given during the commencement of the SBP and UHRS activities. The MMO will be located at a suitable vantage point, providing good all-round visibility. 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 (see Section 4.2.3).

4.2.2 Pre-Start Monitoring

Visual (MMO) will be conducted for a pre-soft start search of 30 minutes i.e. prior to the commencement of SBP and UHRS operations. 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 DAHG 2014 guidance.

4.2.3 Monitored Zone

The DAHG 2014 guidance defines the monitored zone as a 1,000m radial distance around the UHRS noise source and a 500m radial distance around the SBP noise source. Should any marine mammal species be detected within the monitored zone, commencement of the site investigation activities (SBP and UHRS operations) will be delayed until their passage, or the transit of the survey vessel, results in the marine mammals being of sufficient distance from the vessel. There will be a 30-minute delay from the time of the last sighting within the monitored zone to the commencement/recommencement of the SBP and UHRS operations. The MMO will use a distance measuring stick or reticule binoculars to ascertain distances to marine mammals. It should be noted that once started site investigations will not cease should marine mammals approach the survey vessel.

4.2.4 Soft-start / 'Ramp Up' procedure

A soft start is the gradual ramping of power over a set period of time, to give any marine mammals 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 DAHG 2014 guidance for monitored zones activity dependent).

In commencing a geophysical 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.

4.2.5 Line Changes

In line with DAHG 2014 guidance, 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).

4.2.6 Breaks in sound output

In line with DAHG 2014 guidance, if there is a break in sound output for a period of 5-10 minutes (e.g., due to equipment failure, shut-down, survey line or station change), MMO monitoring must be undertaken to check that no marine mammals are observed within the Monitored Zone prior to recommencement of the sound source at full power.

Where a marine mammal is observed within the Monitored Zone during such a break of 5-10 minutes, then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) shall recommence as in a normal start-up operation.

If there is a break in sound output for a period greater than 10 minutes (e.g., due to equipment failure, shut-down, survey line or station change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) must be undertaken.

4.2.7 Reporting

The MMO will submit a report to the relevant Regulatory Authority within 30 days of completion of any geophysical survey activity. The report will follow the guidance and standardized template provided in Appendix 6 of the DAHG 2014 guidance (*'Operator and marine mammal observer (MMO) reporting and standard (JIP) data forms for Geophysical Acoustic Surveys'*).

4.2.8 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 region of the Foreshore Licence Area (particularly in and out of Galway harbour). 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.

4.3 Potential impacts

4.3.1 Injury

The soft-start procedure included in the protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) is considered sufficient by NPWS, the competent authority for marine environmental protection to ensure that even the most sensitive of marine mammal species (i.e. harbour porpoise, bottlenose dolphin, grey seal, harbour seal) is protected from injury impacts from site investigation underwater noise sources. In consideration of the relevant mitigation measures being applied, no marine mammal would be within the monitored zone and therefore no injury impact will occur. For these reasons, it is highly unlikely that any injury impacts from use of the geophysical survey equipment would have an adverse effect on conservation objective of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the site investigation activities will not impair the ability of any individual marine mammal to survive or reproduce.

4.3.2 Disturbance

As the survey vessel will not be stationary for prolonged periods during the site investigation activities, animals within a particular area will not be exposed to extended periods of underwater noise. Rather, individuals would have to follow the moving equipment to be subjected to lasting or prolonged periods of noise which may have detrimental effects at the individual or population level (i.e. a significant disturbance), which is highly unlikely.

The survey activities are anticipated to be completed in periods of 2-3 months, and within this time there will be periods of inactivity during weather downtime. Given the transient and short-term nature of the survey and vessel activities, and through strict adherence to the DAHG 2014 guidance (mitigation measures outlined in Section 4.2) it is highly unlikely that any disturbance impacts from use of the geophysical survey equipment would have an adverse effect on conservation objective of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the level disturbance is highly unlikely to affect the ability of any individual marine mammal to survive or reproduce.

4.4 Conservation objectives

4.4.1 Harbour Porpoise

The conservation objectives to maintain the favourable condition of harbour porpoise in the Blasket Islands SAC and Roaringwater Bay and Islands SAC are provided in Appendix B but notably refer to disturbance from human activity not adversely affecting harbour porpoise.

As presented in Section 4.3, with strict adherence to the DAHG 2014 guidance and the mitigation measures outlined in Section 4.2, the site investigation activities will not have any adverse effect on the ability of marine mammals to survive or reproduce due to underwater noise or vessel disturbance. Therefore, the conservation objectives for the harbour porpoise population at Blasket Islands SAC and Roaringwater Bay and Islands SAC will not be adversely affected and the integrity of these sites will be maintained.

Therefore, in view of best scientific knowledge and the conservations objectives of the European sites, the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm, individually or in combination (see Section 4.5) with another plan or project, will not have an adverse effect on the integrity of Blasket Islands SAC and Roaringwater Bay and Islands SAC.

4.4.2 Bottlenose Dolphin

In the absence of defined conservation objectives for bottlenose dolphin (NWPS, 2015; NWPS, 2012), a precautionary conservation objective to restore the favourable condition of bottlenose dolphin in the Slyne Head Islands SAC and Slyne Head Peninsula SAC has been assumed in this assessment. The conservation objectives to maintain the favourable condition of bottlenose dolphin in the West Connacht Coast SAC are provided in Appendix B but notably refer to disturbance from human activity not adversely affecting bottlenose dolphin.

As presented in Section 4.3, with strict adherence to the DAHG 2014 guidance and the mitigation measures outlined in Section 4.2, the site investigation activities will not have any adverse effect on the ability of marine mammals to survive or reproduce due to underwater noise or vessel disturbance. Therefore, the conservation objectives for the bottlenose dolphin population at the Slyne Head Islands SAC, Slyne Head Peninsula SAC and West Connacht Coast SAC will not be adversely affected and the integrity of these sites will be maintained.

Therefore, in view of best scientific knowledge and the conservations objectives of the European sites, the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm, individually or in combination (see Section 4.5) with another plan or project, will not have an adverse effect on the integrity of Slyne Head Islands SAC, Slyne Head Peninsula SAC and West Connacht Coast SAC.

4.4.3 Grey Seal and Harbour Seal

In relation to grey seal and harbour seal, the following SACs are their conservation objectives (detail provided in Appendix B) are considered in this NIS:

- Kilkieran Bay and Islands SAC – Maintain favourable condition of harbour seal
- Galway Bay Complex SAC – Maintain favourable condition of harbour seal
- Blasket Islands SAC – Maintain favourable condition of grey seal
- Duvillaun Islands SAC – Maintain favourable condition of grey seal
- Inishbofin and Inishshark SAC - Maintain favourable condition of grey seal
- Inishkea Islands SAC – Maintain favourable condition of grey seal
- Roaringwater Bay and Islands SAC – Maintain favourable condition of grey seal
- Slieve Tooey/Tormore Island/Loughros Beg Bay SAC – Maintain favourable condition of grey seal
- Slyne Head Islands SAC – Maintain favourable condition of grey seal

As presented in Section 4.3, with strict adherence to the DAHG 2014 guidance and the mitigation measures outlined in Section 4.2, the site investigation activities will not have any adverse effect on the ability of grey seals or harbour seals to survive or reproduce due to underwater noise or vessel disturbance. Additionally, the site investigations will not restrict the species range in any way or impact on the breeding, haul-out or breeding sites of

these species. Therefore, the conservation objectives for grey seal and harbour seal population at the SACs listed above will not be adversely affected and the integrity of these sites will be maintained.

Therefore, in view of best scientific knowledge and the conservations objectives of the European sites, the proposed site investigation activities at Sceirde Rocks Offshore Wind Farm, individually or in combination (see Section 4.5) with another plan or project, will not have an adverse effect on the integrity of SACs listed above.

4.5 In-combination

The 'Report to Inform Appropriate Assessment Screening' produced and submitted with this licence application identified and considered the other plans or projects with potential for in-combination effects. It was concluded that potential likely significant effects from underwater noise could not be excluded in-combination with the following projects:

- Deep Sea Fibre Networks (FS007016); and
- Marine Institute – Spiddal (FS006566).

In addition, from a review of 4C offshore website (https://map.4coffshore.com/offshorewind/, visited January 2022), the following offshore wind farm projects located on the west coast of Ireland but do not have foreshore licences available on the DHLGH website (with their distance from the Foreshore Licence Area stated):

- Ilen Offshore Wind Farm (approx. 45km);
- Inis West 2 Offshore Wind Farm (approx. 50km);
- Clarus Offshore Wind Farm (approx. 55km);
- Moneypoint Offshore Two (approx. 85km);
- Moneypoint Offshore One (approx. 90km); and
- Inis West 1 Offshore Wind Farm (approx. 95km).

Therefore, in order to take a precautionary approach, potential survey activities for these projects are also considered in this in-combination effect assessment.

The pathway for in-combination effects to be assessed is underwater noise from site investigation activities of the multiple projects. However, all projects are required to undertake their marine surveys in accordance with the mitigation and guidelines provided in the 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014), and therefore it is highly unlikely that any in-combination injury or disturbance impacts from use of the geophysical survey equipment would have an adverse effect on conservation objectives of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the site investigation activities in-combination, when undertaken in accordance the 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will not impair the ability of any individual marine mammal to survive or reproduce.

5 CONCLUSION

This NIS provides the necessary information to the Minister to enable them to determine pursuant to Regulation 42 of the Birds and Natural Habitats Regulations whether

The following SACs were screened in for Stage 2 Appropriate Assessment (see Table 3-1 in Section 3.3.1 of this NIS):

- Blasket Islands;
- Duvillaun Islands;
- Galway Bay Complex;
- Inishbofin and Inishshark;
- Inishkea Islands;
- Kilkieran Bay and Islands;
- Roaringwater Bay and Islands;
- Slieve Tooey/Tormore Island/Loughros Beg Bay;
- Slyne Head Islands;
- Slyne Head Peninsula; and
- West Connacht Coast.

For these SACs, this NIS has examined, in light of the best scientific knowledge and evidence, the potential impacts of the Sceirde Rocks Offshore Wind Farm site investigation activities (Section 4.3). Mitigation measures are outlined in Section 4.2 and they ensure that there will be no adverse effects on the integrity of the SACs, listed above having regard to their conservation objectives, either alone or in-combination with the following projects (Section 4.5):

- Deep Sea Fibre Networks (FS007016);
- Marine Institute – Spiddal (FS006566);
- Ilen Offshore Wind Farm;
- Inis West 2 Offshore Wind Farm;
- Clarus Offshore Wind Farm;
- Moneypoint Offshore Two;
- Moneypoint Offshore One; and
- Inis West 1 Offshore Wind Farm.

Therefore, this NIS concludes that, in view of best scientific knowledge, considering the nature of the potential impacts and implementation of industry approved mitigation measures the Sceirde Rocks Offshore Wind Farm site investigation activities will have no adverse effect (alone or in-combination with another plan or project) on the integrity of any European Site, having regard to their conservation objectives.

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APPENDIX A SAC SITES REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
Blasket Islands [002172]	125.05 km	Harbour porpoise (*Phocoena phocoena*)	Maintain favourable condition	✓
		Reefs	Maintain favourable condition	✗
		Submerged or partially submerged sea caves	Maintain favourable condition	✗
		Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
Duvillaun Islands [000495]	78.24 km	Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
	25.81 km	Coastal lagoons	Restore to favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
Inishbofin and Inishshark [000278]		Oligotrophic waters with few minerals of sandy plains (*Littorelletalia uniflorae*)	Maintain favourable condition	✗
		North Atlantic wet heaths with Erica tetralix	Restore to favourable condition	✗
		European dry heaths	Restore to favourable condition	✗
		Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
Kilkieran Bay and Islands [002111]	0 km			
		Mudflats and sandflats not covered at low tide	Maintain favourable condition	✗
		Coastal lagoons	Maintain favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Large shallow inlets and bays	Maintain favourable condition	✕
		Reefs	Maintain favourable condition	✕
		Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Restore to favourable condition	✕
		Mediterranean salt meadows (*Juncetalia maritime*)	Restore to favourable condition	✕
		Machairs	Restore to favourable condition	✕
		Oligotrophic to mesotrophic standing waters with vegetation of *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*	*Restore to favourable condition*	✕

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)	Maintain favourable conditions	✗
		Otter (*Lutra lutra*)	Restore to favourable condition	✗
		Harbour seal (*Phoca vitulina*)	Maintain favourable condition	✓
		Slender Naiad (*Najas flexilis*)	Maintain favourable condition	✗
Galway Bay Complex [000268]	43.11 km	Mudflats and sandflats not covered at low tide	Maintain favourable condition	✗
		Coastal lagoons	Restore to favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Large shallow inlets and bays	Maintain favourable condition	✕
		Reefs	Maintain favourable condition	✕
		Perennial vegetation of stony banks	Maintain favourable condition	✕
		Vegetated sea cliffs of the Atlantic and Baltic coasts	*Restore to favourable condition*	✕
		Salicornia and other annuals colonising mud and sand	Maintain favourable conditions	✕
		Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Restore to favourable condition	✕

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Mediterranean salt meadows (*Juncetalia maritime*)	Restore to favourable condition	×
		Turloughs	Maintain favourable condition	×
		Juniperus communis formations on heaths or calcareous grassland	Restore to favourable condition	×
		Semi-natural dry grassland and scrubland facies on calcareous substrates	Maintain favourable condition	×
		Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	Maintain favourable condition	×
		Alkaline fens	Maintain favourable condition	×
		Limestone pavements		×

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Otter (*Lutra lutra*)	Restore to favourable condition	✗
		Harbour seal (*Phoca vitulinal*)	Maintain favourable condition	✓
Slyne Head Islands [000328]	3.82 km	Reefs	Maintain favourable condition	✗
		Common bottlenose dolphin (*Tursiops truncatus*)	*Restore to favourable condition*	✓
		Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
Inishkea Islands [000507]	81.41 km	Machairs	Restore to favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
		Petalwort (*Petalophyllum ralfsii*)	Maintain favourable condition	✗
Slieve Tooey/Tormore Island/Loughros Beg Bay [000190]	172.99 km	Vegetated sea cliffs on the Atlantic and Baltic coasts	Maintain favourable condition	✗
		Embryonic shifting dunes	Maintain favourable condition	✗
		Shifting dunes along the shoreline with white dunes (*Ammophila arenaria*)	Restore to favourable condition	✗
		Fixed coastal dunes with grey dunes	*Restore to favourable condition*	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Decalcified fixed dunes with *Empetrum nigrum*	Maintain favourable condition	✕
		Alpine and Boreal heaths	Restore to favourable condition	✕
		Blanket bogs	Restore to favourable condition	✕
		Narrow-mouthed Whorl Snail (*Vertigo angustior*)	Maintain favourable condition	✕
		Atlantic decalcified dunes	Maintain favourable condition	✕
		Otter (*Lutra lutra*)	Maintain favourable condition	✕

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Grey seal (*Halichoerus grypus*)	Maintain favourable condition	✓
Roaringwater bay and Islands [000101]	185.97 km	Large shallow inlets and bays	Maintain favourable condition	✗
		Reefs	Maintain favourable condition	✗
		Vegetated sea cliffs of the Atlantic and Baltic coasts	Maintain favourable condition	✗
		European dry heaths	*Restore to favourable condition*	✗
		Submerged or partially submerged sea caves	*Restore to favourable condition*	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Harbour porpoise (*Phocoena phocoena*)	Maintain favourable condition	✓
		Otter (*Lutra lutra*)	Restore favourable condition	✗
		Grey seal (*Halichoerus grypusI*)	Maintain favourable condition	✓
Slyne Head Peninsula [002074]	4.84 km	Coastal lagoons	Restore to favourable condition	✗
		Large shallow inlets and bays	Maintain favourable condition	✗
		Reefs	Maintain favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Annual vegetation of drift lines	Maintain favourable condition	✕
		Perennial vegetation of stony banks	Maintain favourable condition	✕
		Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Restore to favourable condition	✕
		Mediterranean salt meadows (*Juncetalia maritime*)	Restore to favourable condition	✕
		Embryonic shifting dunes	Restore to favourable condition	✕
		Shifting dunes along the shoreline with white dunes	Restore to favourable condition	✕

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Machairs	Restore to favourable condition	✕
		Oligotrophic water containing very few minerals of sandy plains	Maintain favourable condition	✕
		Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-Nanojuncetea	*Restore to favourable condition*	✕
		Hard oligo-mesotrophic water with benthic vegetation of Chara spp.	Maintain favourable condition	✕
		European dry heaths	Maintain favourable condition	✕
		Juniperus communis formations on heaths or calcareous grasslands	Maintain favourable condition	✕

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Semi-natural dry grasslands and scrubland facies on calcareous substrates	Maintain favourable condition	✗
		Molinia meadows on calcareous, peaty or clayey-silt-laden soils	Maintain favourable condition	✗
		Lowland hay meadows	Maintain favourable condition	✗
		Alkaline fens	Maintain favourable condition	✗
		Common bottlenose dolphin (*Tursiops truncatus*)	*Restore to favourable condition*	✓
		Petalwort (*Petalophyllum ralfsii*)	Maintain favourable condition	✗

SAC NAME [SITE CODE]	DISTANCE FROM THE FORESHORE LICENCE AREA	MARINE FEATURES OF SITE DESIGNATION	CONSERVATION OBJECTIVE	RECEPTOR REQUIRING EVALUATION IN APPROPRIATE ASSESSMENT DUE TO POTENTIAL IMPACT FROM PLANNED UNDERWATER NOISE
		Slender Naiad (*Najas flexilis*)	Maintain favourable condition	✗
West Connacht Coast [002998]	9.84 km	Common bottlenose dolphin (*Tursiops truncatus*)	Maintain favourable condition	✓

APPENDIX B CONSERVATION OBJECTIVES

B.1 Harbour porpoise

B.1.1 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. See map 8	See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	See marine supporting document for further details

*Source - NWPS (2014) Conservation Objectives Series – Blasket Islands SAC 002172

B.1.2 Roaringwater Bay and Islands SAC

Conservation objectives for: Roaringwater Bay and Islands SAC [000101]			
1351	**Harbour porpoise *Phocoena phocoena***		
To maintain the favourable conservation condition of Harbour Porpoise in Roaringwater Bay and 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. See map 6	See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	See marine supporting document for further details

*Source - NWPS (2011) Conservation Objectives Series – Roaringwater Bay and Islands SAC 000101

B.2 Bottlenose dolphin

B.2.1 West Connacht Coast SAC

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. See map 3	See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	See marine supporting document for further details

*Source - NPWS (2015) Conservation Objectives: West Connacht Coast SAC 002998. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

6.1 Harbour Seal

6.1.1 Kilkieran Bay and Islands SAC

Conservation Objectives for : Kilkieran Bay and Islands SAC [002111]

1365 Harbour seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in Kilkieran Bay and 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. See map 11	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve breeding sites in a natural condition. See map 11	Attribute and target based on background knowledge of Irish breeding populations, review of data summarised by Summers et al. (1980), Warner (1983), Harrington (1990), Doyle (2002), Lyons (2004), and unpublished NPWS records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve moult haul-out sites in a natural condition. See map 11	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004), Cronin et al. (2004), and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve resting haul-out sites in a natural condition. See map 11	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	See marine supporting document for further details

*Source - NPWS (2014) Conservation Objectives: Kilkieran Bay and Islands SAC 002111. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

6.1.2 Galway Bay Complex SAC

Conservation Objectives for : Galway Bay Complex SAC [000268]

1365 Harbour seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex 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. See map 12	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve breeding sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish breeding populations, review of data summarised by Summers et al. (1980), Warner (1983), Harrington (1990), Doyle (2002), Lyons (2004), and unpublished NPWS records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve moult haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004), Cronin et al. (2004), NPWS (2010, 2011, 2012) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve resting haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	See marine supporting document for further details

*Source - NPWS (2013) Conservation Objectives: Galway Bay Complex SAC 000268. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

B.3 Grey seal

B.3.1 Blasket Islands SAC

Conservation Objectives for : Blasket Islands SAC [002172]			
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. See map 9	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 9 for known sites	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). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 9 for known sites	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. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Maintain the resting haul-out sites in a natural condition. See map 9 for known sites	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. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NWPS (2014) Conservation Objectives Series – Blasket Islands SAC 002172

B.3.2 Duvillaun Islands SAC

Conservation Objectives for : Duvillaun Islands SAC [000495]

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. See map 3	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 3 for known sites	Attribute and target based on background knowledge of Irish breeding populations, comprehensive breeding surveys in 1995 (Kiely, 1998; Kiely and Myers, 1998), 1998 and 1999 (BIM, 2001), 2002 (Ó Cadhla and Strong, 2003) and 2005 (Ó Cadhla et al., 2008) and unpublished NPWS records including those reported by Lyons (2004). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 3 for known sites	Attribute and target based on background knowledge of Irish breeding populations, review of data from Kiely (1998) and Lyons (2004), a national moult survey (Ó Cadhla and Strong, 2007) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 3 for known sites	Attribute and target based on review data from Kiely (1998), BIM (2001), Lyons (2004), Cronin et al. (2004), Ó Cadhla et al. (2008) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NPWS (2013) Conservation Objectives: Duvillaun Islands SAC 000495. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

B.3.3 Inishbofin and Inishshark SAC

Conservation Objectives for : Inishbofin and Inishshark SAC [000278]

1364 Grey Seal *Halichoerus grypus*

To maintain the favourable conservation condition of Grey Seal in Inishbofin and Inishshark 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 SAC should not be restricted by artificial barriers to site use. See map 5	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 5	Attribute and target based on background knowledge of Irish breeding populations, comprehensive breeding surveys in 1995 (Kiely, 1998; Kiely and Myers, 1998), 1998 and 1999 (BIM, 2001), 2002 (Ó Cadhla and Strong, 2003) and 2005 (Ó Cadhla et al, 2008) and unpublished NPWS records, including those reported by Lyons (2004). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 5	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. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 5	Attribute and target based on review of data from Kiely (1998), BIM (2001), Lyons (2004), Cronin et al., (2004), Ó Cadhla et al, (2008) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NPWS (2015) Conservation Objectives: Inishbofin and Inishshark SAC 000278. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

B.3.4 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 SAC should not be restricted by artificial barriers to site use. See map 4	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 4 for known sites	Attribute and target based on background knowledge of Irish breeding populations, repeated breeding surveys in 1995, 1996 (Kiely, 1998; Kiely and Myers, 1998), 1998 and 1999 (BIM, 2001), 2002 (Ó Cadhla and Strong, 2003), 2003 (Cronin and Ó Cadhla, 2004; Cronin et al., 2007), 2005 (Ó Cadhla et al., 2008) and 2011 (Ó Cadhla et al., 2013), and unpublished NPWS records including those reported by Summers (1983) and Lyons (2004). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 4 for known sites	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. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 4 for known sites	Attribute and target based on review of data from Kiely (1998), BIM (2001), Lyons (2004), Cronin et al. (2004), Ó Cadhla et al. (2008), Duck and Morris (2013) and unpublished NPWS. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NPWS (2015) Conservation Objectives: Inishkea Islands SAC 000507. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

B.3.5 Roaringwater Bay and Islands SAC

Conservation objectives for: Roaringwater Bay and Islands SAC [000101]

1364 Grey seal *Halichoerus grypus*

To maintain the favourable conservation condition of Grey Seal in Roaringwater Bay and 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. See map 6	See marine supporting document for further details
Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition. See map 6 for known sites	Attribute and target based on background knowledge of Irish breeding populations, a comprehensive breeding survey in 2005 (Ó Cadhla et al., 2007) and unpublished National Parks and Wildlife Service records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition. See map 6 for known sites	Attribute and target based on background knowledge of Irish populations, a national moult survey (Ó Cadhla and Strong, 2007) and unpublished National Parks and Wildlife Service records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition. See map 6 for known sites	Attribute and target based on review of data from Lyons (2004), Cronin et al. (2004), Ó Cadhla et al. (2007), Ó Cadhla and Strong (2007) and unpublished National Parks and Wildlife Service records. See marine supporting document for further details
Population composition	Number of cohorts	The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually	Attribute and target based on review of data from Lyons (2004), Ó Cadhla et al. (2007), Ó Cadhla and Strong (2007) and unpublished National Parks and Wildlife Service records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NWPS (2011) Conservation Objectives Series – Roaringwater Bay and Islands SAC 000101

B.3.6 Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Conservation Objectives for : Slieve Tooey/Tormore Island/Loughros Beg Bay SAC [000190]

1364 Grey Seal *Halichoerus grypus*

To maintain the favourable conservation condition of Grey Seal in Slieve Tooey/Tormore Island/Loughros Beg 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 SAC should not be restricted by artificial barriers to site use. See map 7	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 7 for known sites	Attribute and target based on background knowledge of Irish breeding populations, a preliminary survey in 2003 (Cronin and Ó Cadhla, 2004; Cronin et al., 2007), comprehensive breeding surveys in 2005 (Ó Cadhla et al., 2008) and 2012 (Ó Cadhla et al., 2013) and unpublished NPWS records including those reported by Summers (1983) and Lyons (2004). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 7 for known sites	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 & Strong, 2007) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 7 for known sites	Attribute and target based on review data from Lyons (2004), Cronin et al. (2004), Duck and Morris (2013) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the SAC	See marine supporting document for further details

*Source - NPWS (2015) Conservation Objectives: Slieve Tooey/Tormore Island/Loughros Beg Bay SAC 000190. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

B.3.7 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. See map 5	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 5	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. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 5	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. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 5	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. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

*Source - NPWS (2012) Conservation Objectives: Slyne Head Islands SAC 000328. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.