

Dublin Array Offshore Wind Farm

Annex C: Environmental Impact Assessment Screening and Environmental Report

Site Investigation and Ecological Monitoring Works

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Acronyms

Term	Definition
AA	Appropriate Assessment
CD / mCD	Chart Datum/ meters relative to Chart Datum
CEA	Cumulative Effects Assessment
DAHG	Department for Culture, Heritage and the Gaeltacht
DCCAIE	Department of Communications, Climate Action and Environment
Dublin Array	Dublin Array Offshore Wind Farm
ECC	Export cable corridor
ECR	Export cable route
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
GIS	Geographical Information System
GW	Gigawatt
HDD	Horizontal Directional Drilling
INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resource
km	Kilometres
LAT/ mLAT	Lowest Astronomical Tide/ meters relative to Lowest Astronomical Tide
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MSL	Mean Sea Level
NIS	Natura Impact Statement
NPWS	National Parks Wildlife Service
O and M	Operations and maintenance
ORE	Offshore Renewable Energy
OSS	Onshore substation
R and D	Research and development
ROI	Republic of Ireland
RSL	Relative Sea Level

Term	Definition
RWE	RWE Renewables Ireland Ltd (a wholly owned subsidiary of RWE AG)
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SPA	Special Protection Area
UK	United Kingdom
WTG	Wind Turbine Generator
ZoI	Zone of Influence

1 Introduction

- 1.1.1 RWE Renewables Ireland Limited (RWE) are applying for authorisation to undertake a geotechnical and geophysical site investigation for the proposed Dublin Array offshore wind farm development, in addition to ecological and wind, wave and current monitoring. The site is located immediately south of Dublin City in the foreshore adjoining the functional areas of Dublin City Council, Fingal County Council, Dun Laoghaire and Rathdown County Council and Wicklow County Council and extends approximately 17 km offshore and includes the vicinity of the Kish and Bray banks. To secure the necessary consent to carry out the proposed works RWE are applying for a Foreshore Licence from the Department of Housing, Local Government and Heritage.
- 1.1.2 GoBe Consultants Ltd have been commissioned by RWE (the Applicant) to support the Foreshore Licence application for site investigation and pre-construction monitoring surveys of Dublin Array. As part of this application an Environmental Impact Assessment (EIA) screening exercise has been undertaken and detailed within this Screening Report, which will accompany the Foreshore Licence application.
- 1.1.3 This EIA Screening Report is being submitted as part of the application process and has been prepared to assist the Minister for Housing, Local Government and Heritage to make a determination as to whether EIA is required. EIA, and screening for EIA, are required only in relation to project types listed in Annex I or Annex II of the EIA Directive 2011/92/EU as revised by Directive 2014/52/EU (EIA Directive) and/or the corresponding classes of project listed in Schedule 5, Parts 1 and 2, of the Planning and Development Regulations 2001, as amended (Planning Regulations).
- 1.1.4 Section 13A of the Foreshore Act 1933, as amended, applies where the project would be of a class specified in either Part 1 or Part 2 of Schedule 5 of the Planning Regulations. The proposed geotechnical and geophysical site investigation, and ecological and wind, wave, and current monitoring, do not correspond to any of the project types in Part 1. This document considers whether any of the proposed site investigations could be said to fall within any of the following classes of project listed in Part 2.

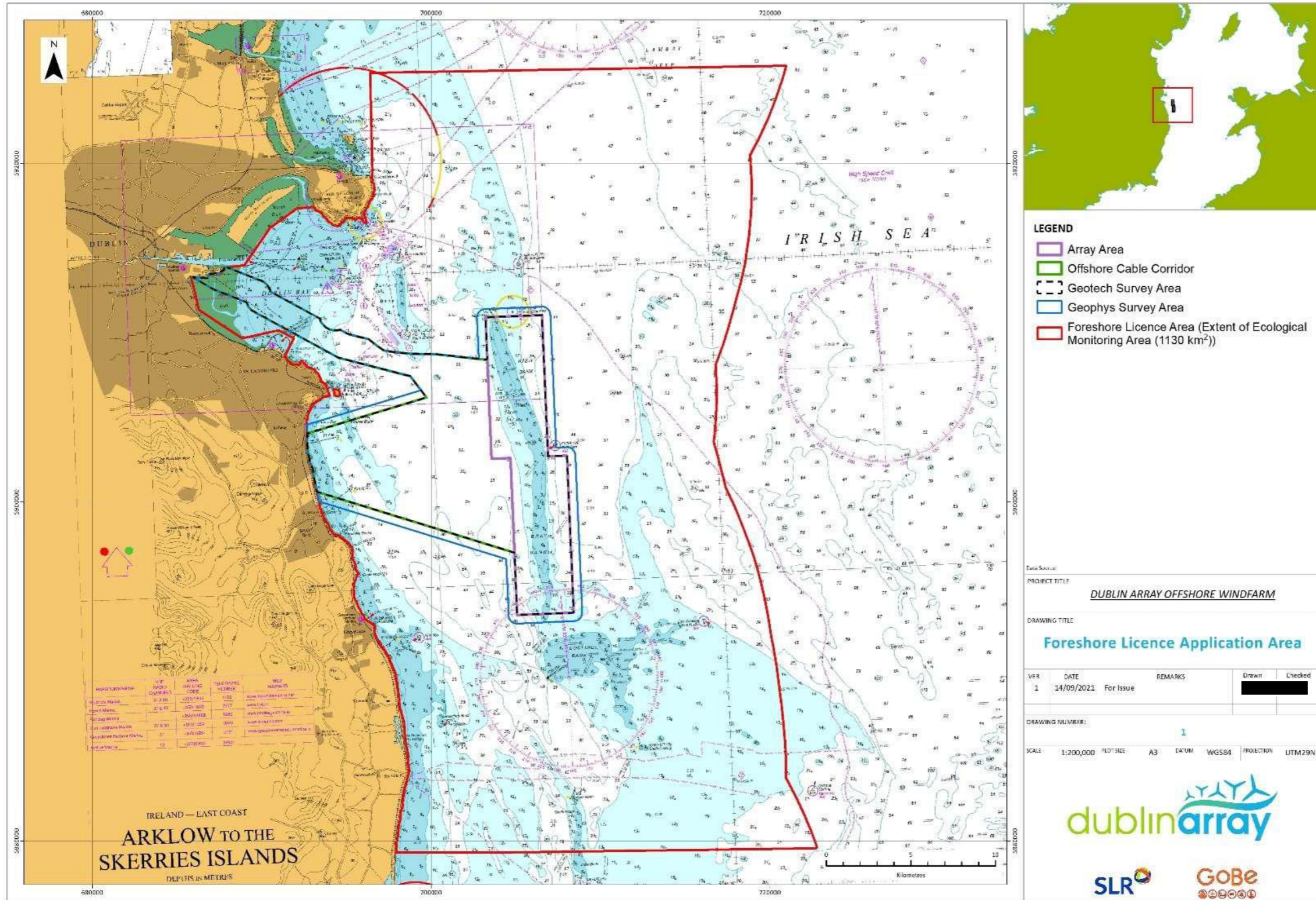


Figure 1 – Location of Dublin Array Foreshore Licence Application Area

2 Project description

2.1 Survey background and purpose

- 2.1.1 Site specific data is required to provide further geotechnical, geophysical, environmental and metocean information in relation to the offshore site conditions to inform detailed design decisions in relation to foundation type, sizing and installation methodology, along with cable route design and installation methodology selection, and to verify the validity of previously acquired data, having regard to the dynamic marine environment.
- 2.1.2 The total Foreshore Licence application area encompasses an area of 1,130 km². Geophysical and geotechnical surveys are planned to take place within the area of the proposed Dublin array in which, subject to development consent being granted, the proposed wind turbine generators (WTG) and Offshore Export Cable Corridor (Offshore ECC) may be located, and two associated cable landfall locations at Poolbeg and Shanganagh (see Figure 1).
- 2.1.3 The wind, wave and current measuring devices will be deployed within the area of the proposed array. The maximum extent of the geotechnical, geophysical and metocean survey area is 189km², but the actual area which may be surveyed within this boundary is likely to be considerably less and may vary depending on what the project decides in terms of inter-array cabling, final array layouts and export cable routes. Ecological monitoring, inclusive of Static Acoustic Monitoring (SAM) will take place over a wider geographical area to provide data coverage of the array, ECC and surrounding area within one tidal excursion of the site boundary.

2.2 Surveys

- 2.2.1 The surveys proposed within this Foreshore Licence application are:
- ▲ Geotechnical survey;
 - ▲ Geophysical survey;
 - ▲ Metocean monitoring;
 - ▲ Static Acoustic Monitoring;
 - ▲ Benthic subtidal monitoring;
 - ▲ Benthic intertidal monitoring; and
 - ▲ Fish and shellfish monitoring.
- 2.2.2 Table 1 outlines the survey requirements and indicative timings reviewed in this screening assessment.

Table 1 – Foreshore Licence survey components

Geographical scope	Survey Requirements	Indicative Timings
Array Area, proposed foundation locations	Up to 61 Geotechnical Boreholes with wireline logging to approximately 80 m below seafloor, with an outside diameter of up to 254 mm.	Summer 2022
Array Area, proposed foundation locations	Up to 61 Deep push seafloor Cone Penetration Tests (CPT) to approximately 80 m below seafloor with a diameter of approximately 40mm.	
Cable Export Route extending into the array	Up to 31 Seafloor CPTs to target depth of approximately 6 m below seafloor with a diameter of approximately 40mm. 5 of which may be located within the intertidal area.	
Inter-array and export cable routes extending into the array	48 vibrocores, approximately 150 mm diameter and penetration depth of up to 6 m. 5 of which may be located within the intertidal area	Summer 2022
Landfall	Up to twelve nearshore geotechnical boreholes with wireline logging and Rotary Cored Drilling, of approximately 100 mm diameter, to a target depth of approximately 45 m below the seabed, (up to 4 at each landfall option).	Summer 2022
Landfall	Refraction survey in the nearshore and intertidal areas.	
Array Area, proposed foundation locations	2D Ultra High Resolution (UHR) and geophysical survey including Bathymetric Survey, Side Scan Sonar, Shallow Reflection Seismic (Sub-bottom Profiling) and Marine Magnetometer.	
Along proposed export cable routes	Geophysical survey including Bathymetric Survey, Side Scan Sonar, Shallow Reflection Seismic (Sub-bottom Profiling) and Marine Magnetometer.	Mid 2022
Array Area	Wind Resource and Metocean Survey comprising up to two buoy mounted Floating Lidar (FLiDAR) Units and up to two buoys incorporating wave and current measurement devices.	
Foreshore Licence Area	Up to 10 static acoustic monitoring devices (SAM).	
Foreshore Licence Area	Up to three subtidal benthic ecology survey comprising drop down video, grab sampling and epibenthic trawls.	Annually from 2023 – 2026
Landfall	Up to three intertidal survey comprising shallow hand cores	Annually from 2023 – 2026
All project	Up to 3 annual potting survey and 12 seasonal trawl surveys (4 per year)	Annually from 2023-2026. Seasonal trawls undertaken during winter, spring, summer and autumn in each of these years.

2.3 Survey methodologies

Geotechnical surveys

2.3.1 Indicative locations of the geotechnical sampling locations which form the scope of the application for this Foreshore Licence are shown in Figure 2. The location of the proposed intertidal boreholes at Shanganagh landfall and Poolbeg are shown in Figure 3 and Figure 4 respectively. The location of the proposed geotechnical sampling locations will be reviewed and refined following review of the most up to date geophysical data. This does not create uncertainty, as the up to date geophysical data will ensure that any potential ecological or archaeological risks will be avoided in selecting the final geotechnical sampling locations. The location of the intertidal boreholes will fall within the area defined in Figure 2:

- ▲ Up to 61 geotechnical wireline-logged boreholes within the proposed array area covering the full site. These boreholes will be to a geologically shallow depth of approximately 80 m below seafloor and an outside diameter of up to 254 mm;
- ▲ Up to 61 deep push seafloor Cone Penetration Tests (CPTs) within the array area, to a target depth of approximately 80 m depth below the seafloor with a diameter of approximately 40mm;
- ▲ 31 Seafloor CPTs within the Offshore ECC and extending into the array area as shown in Figure 2, to an approximate depth of 6 m below the seafloor and a diameter of approximately 40mm;
- ▲ Up to 12 geotechnical wireline logged boreholes within the proposed intertidal and shallow water HDD exit, covering a maximum water depth of 7 m, (4 at each landfall). These boreholes will be to a target depth of approximately 45 m below seafloor and approximately 100 mm diameter; and
- ▲ 48 sub-tidal vibrocores 150 mm in diameter with a penetration depth of up to approximately 6 m and a diameter of approximately 150 mm along the Offshore ECC and inter-array cable routes.

Geophysical surveys

2.3.2 The geographical scope of the geophysical surveys is shown in Figure 2 with the scope defined below:

- ▲ Refraction survey at proposed intertidal locations, including shallow water and intertidal area, undertaken as an onshore or offshore activity, usually from a rigid inflatable boat (RIB) or on foot. This survey will be carried out over defined survey lines at the selected landfall(s) only; the orientation and position of these survey lines will be determined closer to project execution;

- ▲ A 2D Ultra High Resolution Seismic (2DUHRS) survey and full suite of geophysical surveys (Bathymetric Survey, Side Scan Sonar, Shallow Reflection Seismic (Sub-bottom Profiling) and Marine Magnetometer) across the array area. The 2DUHRS survey will cover the array area over the Kish and Bray Banks. Several lines will be run aligned with turbine locations, in a pattern that is most efficient to capture data directly at turbine locations but also considering local metocean conditions; and
- ▲ Geophysical survey of the Offshore ECC. (Bathymetric Survey, Side Scan Sonar (SSS), Shallow Reflection Seismic (Sub-bottom Profiling) and Marine Magnetometer).

Ecology surveys

- 2.3.3 Interpreted geophysical data will be used to provide ground types and seabed features across the array area and Offshore ECC, together with any third party data available across the wider Foreshore Licence application area. This will be used to refine the selection of benthic ecology survey locations to ground truth the data and to provide material for biological sampling.
- ▲ Deployment of up to a maximum 10 SAM devices shown in Figure 5, each deployed on a seabed mooring with a surface marker buoy to detect porpoises, dolphins and other toothed whales;
 - ▲ Up to three annual subtidal benthic ecology surveys, comprising drop down video, grab sampling and epibenthic trawls (locations yet to be defined). Samples will be taken using a Hamon or Van Veen grab (0.1 – 0.2 m²) with a stainless steel bucket at up to 90 locations. Sample depth may be up to 20 cm depending on seabed type. The grab will be deployed and retrieved by winch. Drop down video (DDV) will be deployed at each sampling location prior to grabs being taken. Epibenthic sampling (90 no.) using a standard 2 m Cefas beam trawl fitted with a 5 mm cod designed to collect information on epibenthic invertebrate species, as well as small demersal and juvenile fish. Trawls will be standardised by length (500 m) or duration (10 minutes);
 - ▲ Intertidal surveys are likely to include a walkover survey and a series of shallow cores (up to 48) to be analysed for infauna, sediment granulometry and organic carbon content typically 90 mm in diameter and up to 500 mm in depth;
 - ▲ Up to three annual potting surveys, each comprising up to ten fleets of 20 pots (crab/lobster/whelk pots);
 - ▲ Seasonal trawl survey will include up to 15 pelagic and otter trawls, undertaken four times a year during winter, spring, summer and autumn, for up to three years.

Wind, wave and current measurements

- 2.3.4 The proposed locations of the FLiDaR and wave and current measuring buoys are shown in Figure 6.

- 2.3.5 Metocean monitoring equipment will comprise up to two buoys carrying FLiDAR units for wind measurement. Two buoys with wave and current measurement devices will also be deployed and remain on site for a minimum of two years.

2.4 Vessel requirements

- 2.4.1 The main geophysical survey vessel will be purpose built or suitably converted and equipped to undertake the required operations offshore, in the expected tidal and current regime at the location. A typical vessel would be approximately 70 m to 100 m in length with a draft of approximately 4m and operational speed of approximately 5 knots. A smaller vessel may also be required for sampling nearshore and in shallow water (<7 m depth).
- 2.4.2 The vessel will be capable of remaining safely at sea for a minimum period of 28 days and shall at all times remain in full, proper and safe working order. Operations are likely to be on a 24-hour basis. The vessel shall be capable of performing the required range of geotechnical operations without the need of port calls.
- 2.4.3 A deck mounted crane or A-frame will be required. Vessel deck areas will have good lighting and deck areas used for equipment deployment/recovery will be either visible from the bridge or good quality closed-circuit TV pictures of such areas shall be provided on the bridge at all times of such operations and recorded.
- 2.4.4 The Contractor's geophysical vessel will be dynamically positioned with full redundancy (specifically DP2) for the majority of the work elements.
- 2.4.5 A smaller geophysical survey vessel will be required in the shallow waters (less than 7 m LAT) across the Kish and Bray Banks and nearshore. The vessel will have a shallow draft and be approximately 16 – 20 m in length.
- 2.4.6 The geotechnical survey may be undertaken from a vessel similar to that described above for the main geophysical survey vessel or from a jack-up barge which will utilise a fixed anchoring system to maintain position. In the case of the latter the works will be carried out from a self-elevating platform which is raised above the water's surface. A large jack-up barge legs will have a seabed foot print of approximately 15 – 20m².
- 2.4.7 SAM buoys and metocean buoys will be deployed via a buoy laying tender or multi-CAT with a minimum usable deck space of 50 feet with a low freeboard and a deck-mounted towing winch. On arrival at the deployment location the workboat will either use dynamic positioning or an equivalent method to maintain the workboats at the deployment location. No vessel anchoring or attachment to the seabed will take place during installation.
- 2.4.8 Ecological surveys will be conducted from a small vessel, approximately 18 m in length with suitable deck space and a deck-mounted winch. A fishing vessel may be utilised for the seasonal trawl surveys.

2.5 Mitigation

- 2.5.1 A number of mitigation measures have been proposed within the Supporting Information Report and NIS that supports the licence application. For full details please see Appendix A of this report.

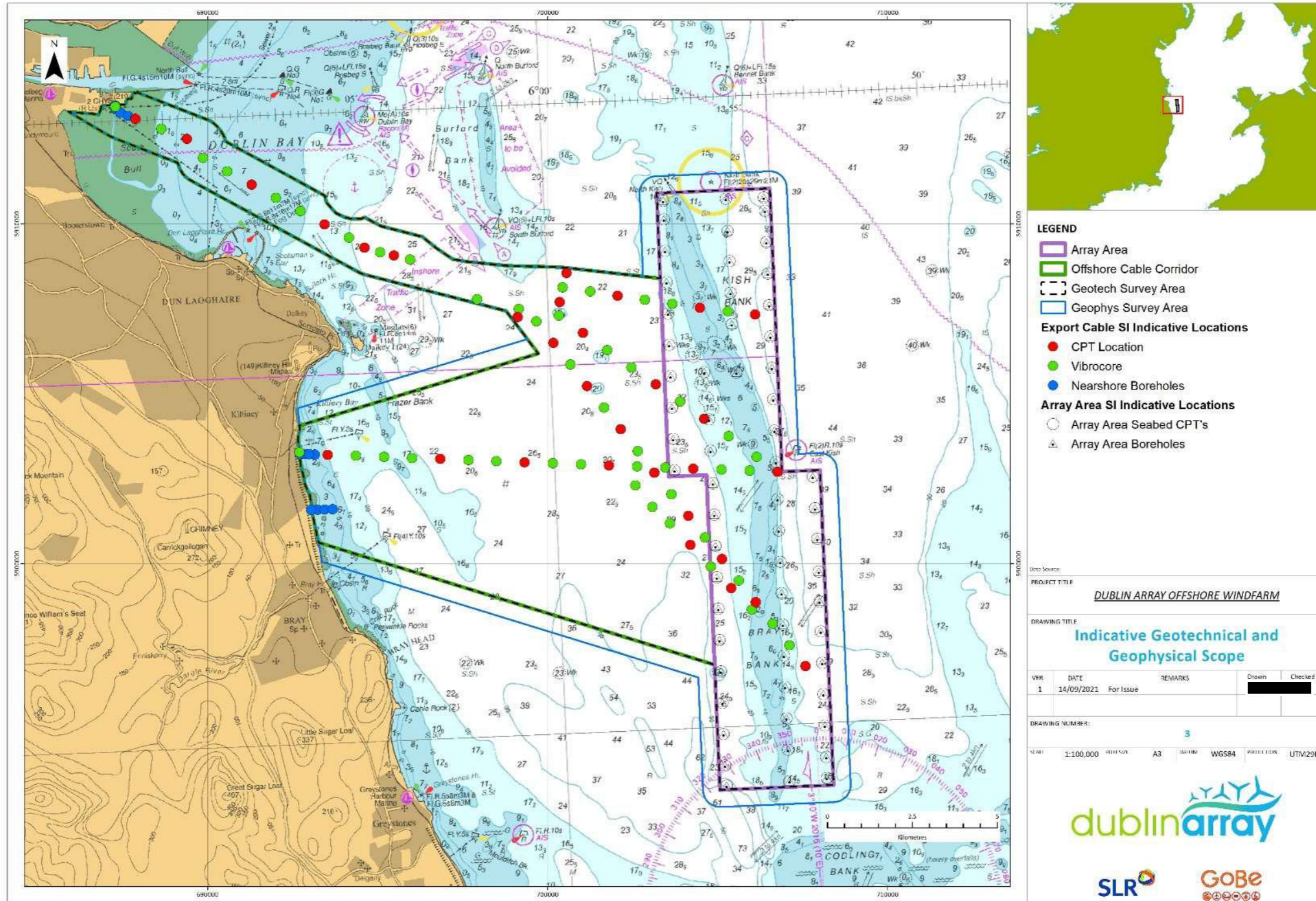


Figure 2 Indicative Geotechnical and Geophysical Scope

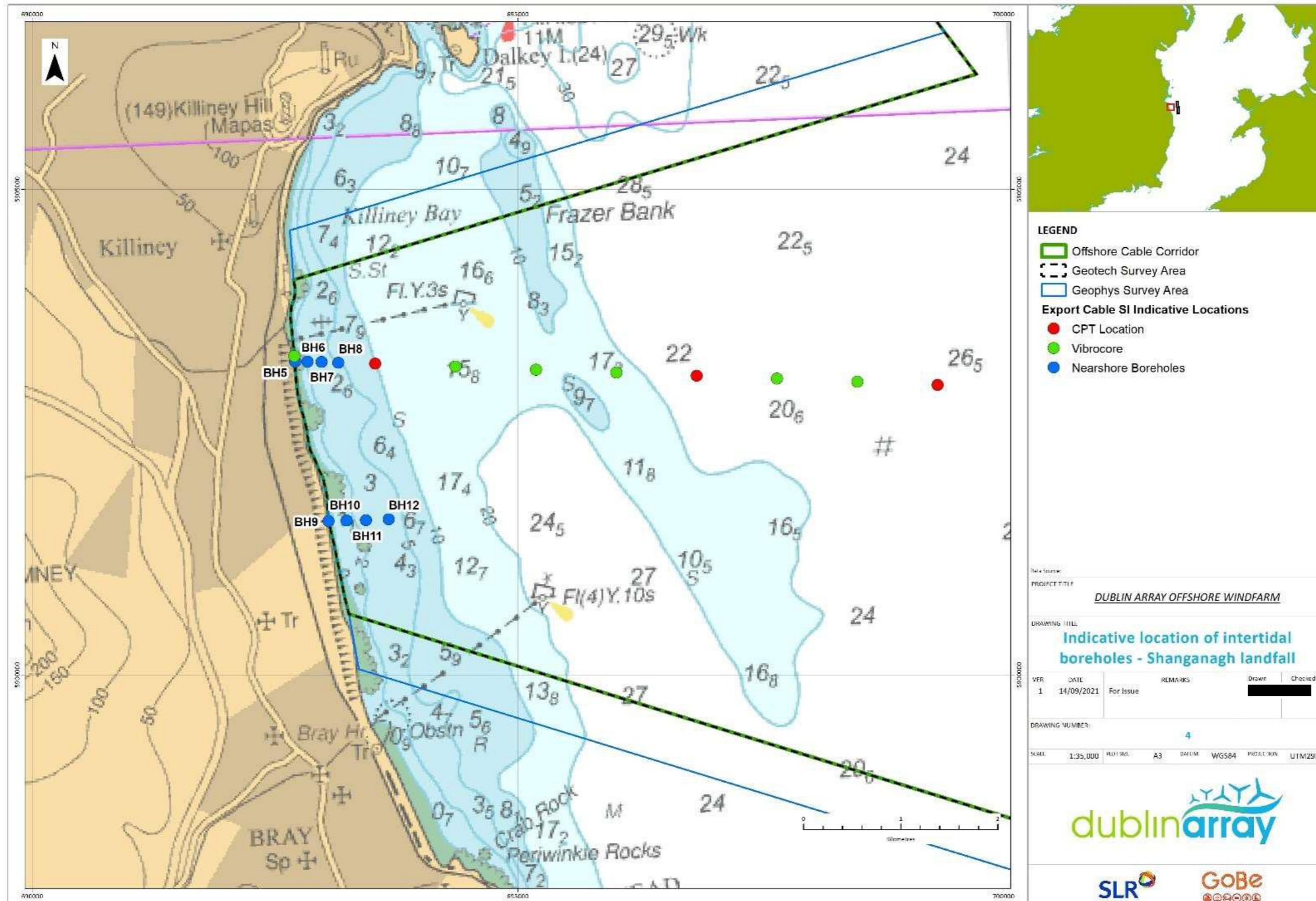


Figure 3 Indicative location of intertidal boreholes – Shanganagh landfall

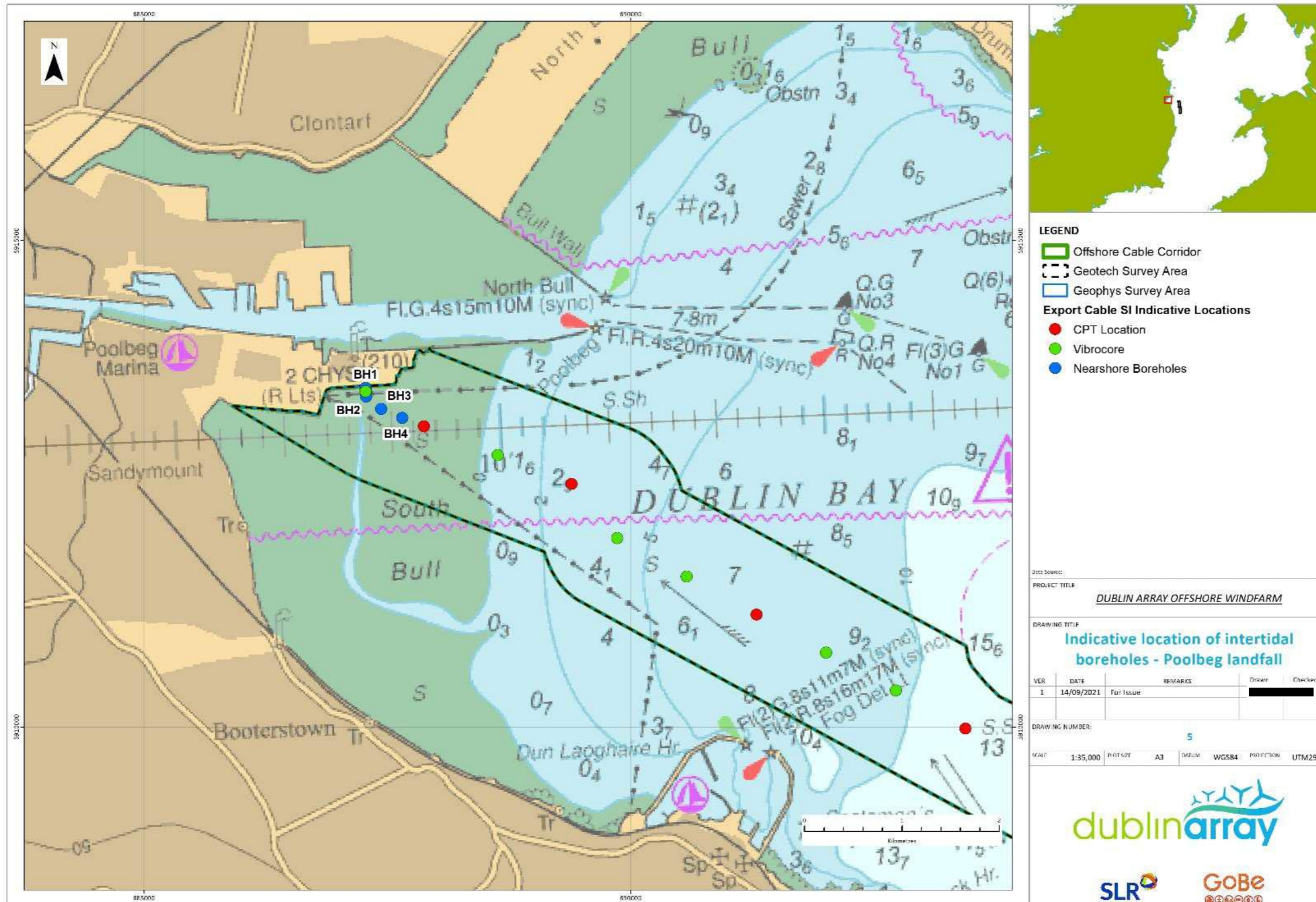


Figure 4 –Indicative location of intertidal boreholes – Poolbeg landfall

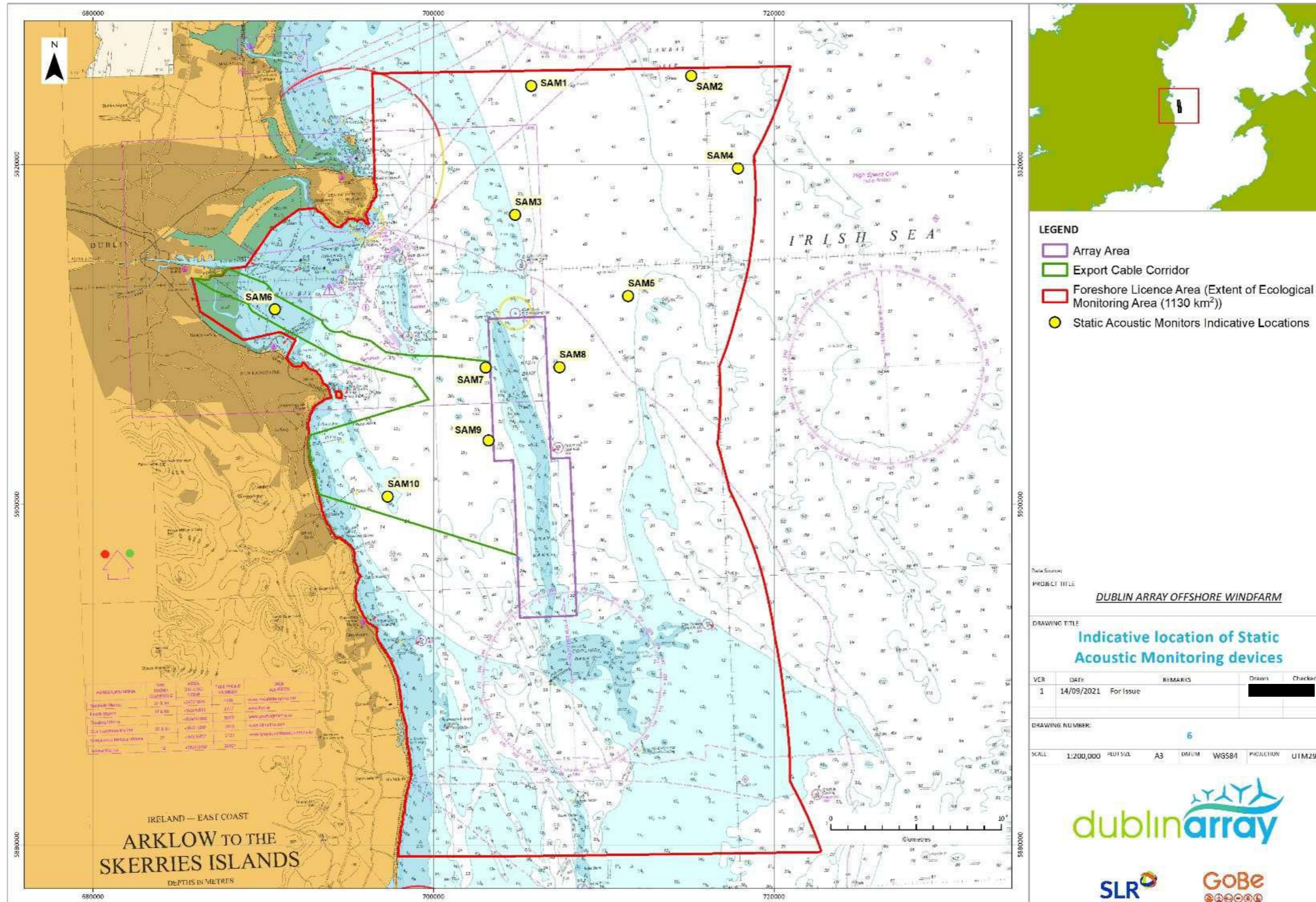


Figure 5 Indicative location of Static Acoustic Monitoring devices

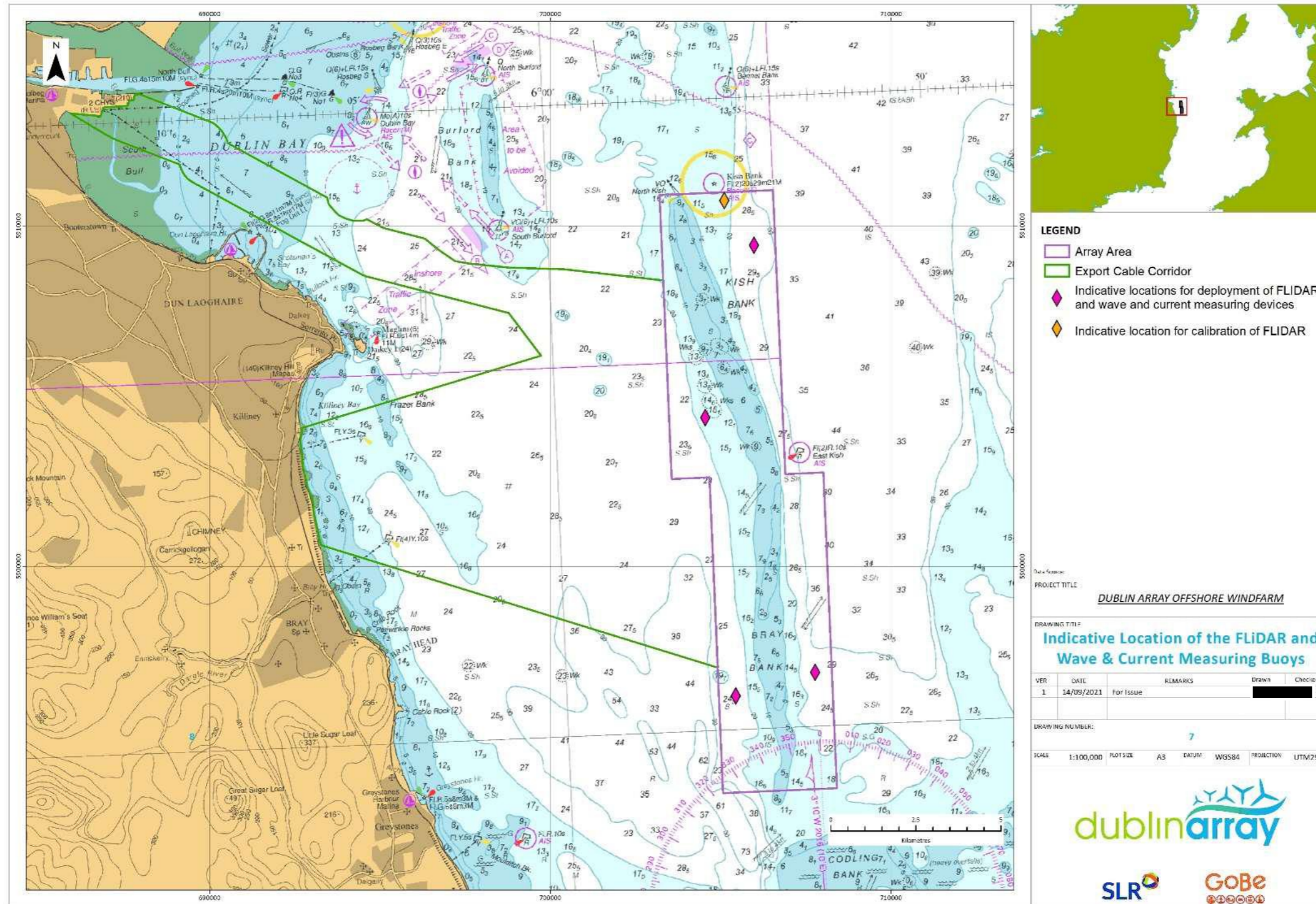


Figure 6 Indicative location of planned metocean buoys

3 EIA screening

3.1 General

3.1.1 Article 2(1) of the EIA Directive¹ provides:

“Member States shall adopt all measures necessary to ensure that, before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment. Those projects are defined in Article 4.”

3.1.2 Article 4(1) requires that “...projects listed in Annex I shall be made subject to an assessment...”. EIA is therefore mandatory for the project types listed in Annex I. Article 4(2) requires that Member States must determine for Annex II project types whether EIA is required, through (a) a case-by-case assessment or (b) thresholds or criteria set by the member State.

3.1.3 The Foreshore Acts 1933, as amended transposes the Article 4 requirement through Section 13A as follows:

“13A.— (1)(a) The appropriate Minister shall, as part of his consideration of a relevant application, in accordance with paragraph (b), ensure that, before a decision on the application is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to an environmental impact assessment.

(b) (i) An environmental impact assessment shall be carried out by the appropriate Minister in respect of a relevant application for consent where the proposed development would be of a class specified in—

(I) Part 1 of Schedule 5 of the Planning and Development Regulations 2001,

and either—

(A) such development would exceed any relevant quantity, area or other limit specified in that Part, or

(B) no quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(II) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either—

(A) such development would exceed any relevant quantity, area or other limit specified in that Part, or

(B) no quantity, area or other limit is specified in that Part in respect of the development concerned.

¹ Environmental Impact Assessment (EIA) Directive (Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU)

ii) *An environmental impact assessment shall be carried out by the appropriate Minister in respect of a proposed development where such development—*

(I) would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not exceed the relevant quantity, area or other limit specified in that Part, and

(II) the appropriate Minister determines that the proposed development would be likely to have significant effects on the environment.”

- 3.1.4 If a proposed development is not of a class listed in Annex I or II of the EIA Directive, or Schedule 5 of the Planning Regulations, the EIA Directive is not applicable.²
- 3.1.5 Part 1 of Schedule 5 of the Planning and Development Regulations 2001, as amended (Planning Regulations) lists the project types for which EIA is mandatory, transposing Annex I of the EIA Directive. Part 2 lists project types for which EIA is mandatory if a specified threshold is exceeded. For all other project types listed in Part 2, corresponding to Annex II, which do not exceed a threshold or for which no threshold is set, a screening analysis and determination are required. Section 13A(b)(i)(II)(B) is therefore more stringent than the Planning Regulations, as it provides that the Minister shall carry out EIA (not screening) in respect of any Part 2 development where no threshold is set.

3.2 Screening for mandatory EIA

Part 1 of Schedule 5

- 3.2.1 All of the project types in Part 1 have been considered in the preparation of this report. The proposed development is not a project type or class listed in Part 1 of Schedule 5 of the Regulations.

Part 2 of Schedule 5

- 3.2.2 All of the project types in Part 2 have been considered in the preparation of this report. The following project types listed in Part 2 are the only project types that could arguably be relevant to the proposed surveys, and are therefore given more detailed consideration in this report:

- 3.2.3 Class 2 Extractive Industry

“(e) With the exception of drilling for investigating the stability of the soil, deep drilling, consisting of—

(iv) any other deep drilling, except where, in considering whether or not an environmental impact assessment should be carried out—

² See *Uí Mhuirín* [2019] IEHC 824 specifically in connection with Foreshore Act 1933, as amended. See also Case C-156/07, *Aiello & Others*; Case C-275/09, *Brussels Hoofdstedelijk Gewest*; *Kavanagh* [2020] IEHC 259; and *Sweetman* [2020] IEHC 39.

(IV) it is decided, in accordance with section 13A of the Foreshore Act 1933 (No. 12 of 1933) (in this subparagraph referred to as the “Act of 1933”), by the appropriate Minister (within the meaning of the Act of 1933) that the drilling concerned would not have a significant effect on the environment.”

For the reasons outlined below, it is considered that the proposed survey works fall within the exception for drilling for investigating the stability of the soil, such site investigations not forming a project type under class 2(e).

3.2.4 Class 3 Energy Industry

“(b) ...transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more”

“(i) Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts”.

Neither the proposed survey works nor the future proposed Dublin Array project will involve overhead cables of 200kv or more.

The proposed **survey works** do not include the harnessing of wind power for energy production (wind farms). The proposed survey works are stand-alone, do not pre-determine any aspect of the future proposed Dublin Array project, and are not functionally interdependent. The proposed survey works do not therefore form an integral part of a class 3(i) project.

3.2.5 Class 10 Infrastructure

“(e) New or extended harbours and port installations, including fishing harbours, not included in Part 1 of this Schedule, where the area, or additional area, of water enclosed would be 20 hectares or more, or which would involve the reclamation of 5 hectares or more of land, or which would involve the construction of additional quays exceeding 500 metres in length”

“(k) Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dikes, moles, jetties and other sea defence works, where the length of coastline on which works would take place would exceed 1 kilometre, but excluding the maintenance and reconstruction of such works or works required for emergency purposes”.

The proposed **survey works** is not a project type which involves the infrastructure as envisaged in Class 10 (e) and (k) above.

3.2.6 Class 13 Changes, extensions, development and testing

“(a) “Any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension referred to in Part 1) which would:- (i) result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2” resulting in a 25% increase in scale, or an increase equal to 50% of the relevant threshold for that type of project.

The proposed survey works is not a project type which involves a change or extension to any Part 1 or Part 2 project type.

3.2.7 Class 15

“Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7”

The proposed survey work is not a sub-threshold development included under this class.

3.2.8 Class 2(e) mirrors Annex II, class 2(d) of the EIA Directive; both expressly exempt drilling for investigating the stability of the soil. Put simply, the proposed geotechnical surveys involve the drilling of boreholes the purpose of which is to investigate the stability and physical characteristics of the seabed, subsoil and sediments, and ground conditions. These investigations are required to determine the type of foundations that will be required for the turbines, and to determine the feasibility of possible subsea (buried) cable routes. These investigations are further required to determine the feasibility of possible cable landing sites and whether horizontal directional drilling (HDD) would be possible at this locations, having regard to the ground conditions encountered during investigations. The geophysical and other survey activities do not involve drilling.

3.2.9 Ultimately it is matter for the Minister, as the competent authority, to determine whether a formal EIA screening determination is required having regard to the provisions of the EIA Directive, s.13A of the Foreshore Acts, and Schedule 5 of the Planning Regulations. The information contained in this report is provided to inform the Minister’s determination on whether EIA screening is required, and if so, to inform the screening assessment and determination.

3.3 Screening of significance of effects on the environment

3.3.1 Where case-by-case screening is required in determining if the proposed works will have significant environmental effects, Schedule 7A of the Planning Regulations sets out the information an applicant should provide for the purposes of screening. Schedule 7A mirrors Annex IIA of the EIA Directive. Schedule 7 lists the criteria that should be taken into account by the competent authority in the EIA screening assessment and determination. Schedule 7 mirrors Annex III of the EIA Directive.

3.4 European Commission guidance checklist

3.4.1 The European Commission (EC) Guidance on EIA Screening (EC, 2017) provides a checklist to address the Annex III requirements and help users decide whether EIA is required based on the characteristics of the project and its environment.

3.4.2 Using the EC Guidance checklist Table 2, no feature of the proposed development or its interaction with the surrounding environment, was identified, which is likely to result in a significant environmental effect.

Table 2 - Screening Checklist to determine if EIA is required based on the characteristics of a project and its environment

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
1	<p>Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?</p>	<p>Yes. The geotechnical survey will cause changes to the seabed with increases in suspended sediment concentrations and subsequent deposition. There will be benthic grab sampling in the area of the array and ecological sampling of the intertidal area. There will be no topographic or land use changes.</p>	<p>No. The survey activities likely to result in physical changes are boreholes, CPTs and vibrocores within the subtidal and intertidal areas and shallow benthic grab sampling</p> <p>The offshore boreholes will be left to backfill naturally. The nearshore boreholes will be grouted to within 2 m of the seabed. See Q3 for details of grout</p> <p>The seabed in the study area is highly mobile and regularly disturbed by natural processes. Any sediment disturbed by the works will settle almost immediately.</p> <p>Given the large area over which the sampling will be carried out and given the type of equipment to be deployed, the relative area of the seabed, which will be disturbed, will be very small and localised and the physical changes to the seabed and water column will be negligible. Sediments disturbed or released during survey activities are predicted to have only a transient impact on suspended sediment concentrations as material is dispersed quickly and will fall below mean background levels within hours of the completion of activity.</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
2	Will construction or operation of the project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?	Yes. These will be limited to items such as fuel and drinking water. The surveys will not utilise a significant quantity of natural resources.	No
3	Will the project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	<p>Yes. The vessels conducting the surveys will use fuels and carry lubricants etc which have the potential to be harmful to the environment should they be released.</p> <p>However, none of the materials associated with the surveys could be harmful to human health or the environment. Intertidal boreholes will be grouted to within 2m of surface of base of mobile sediments using a 2:1 bentonite cement mix.</p>	<p>No. Bentonite is a non-toxic, inert, natural clay mineral (<63 µm particle diameter). It is included in the List of Notified Chemicals approved for use and discharge into the marine environment and is classified as a group E substance under the Offshore Chemical Notification Scheme³. Substances in group E are defined as the group least likely to cause environmental harm and are “readily biodegradable and is non-bioaccumulative”. This is further supported by bentonite being included on the OSPAR List of Substances Used and Discharged Offshore which are considered to Pose Little or No Risk to the Environment (PLONOR).⁴</p> <p>Strict maritime regulations, normal vessel operating standards and precautions will ensure the risk of an accidental release of harmful materials, including fuels and</p>

³ Offshore Chemical Notification Scheme operated by Cefas - <https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/hazard-assessment/>

⁴ OSPAR (2019) ‘OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment’ Available from: <https://www.ospar.org/work-areas/oic/chemicals>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
			lubricants is low and that a significant effect is unlikely. The survey vessels will comply with normal vessel operating standards and with the MARPOL Convention on Marine Pollution, and the Sea Pollution Acts. These mandatory measures will ensure the risk of a release is low and that a significant effect is unlikely.
4	Will the project produce solid wastes during construction or operation or decommissioning?	Yes. Drill cuttings, consisting of seabed material, will be produced as a result of the boreholes. The other surveys will produce minimal waste.	No. The drilling flush and drill cuttings are largely returned to the vessel and re-used and returned to shore for disposal. However, a small volume of the flush and cutting is expected to be released into the environment. The released material will result in a localised increase in turbidity and a small mound of the seabed comprising of the cuttings. The flush will consist of chemicals on the List of Notified Chemicals approved for use and discharge into the marine environment under the Offshore Chemical Notification Scheme as detailed in Q3. The flush and cuttings will not result in any deterioration of sediment or water quality.
5	Will the project release pollutants or any hazardous, toxic or noxious substances to air or lead to exceeding Ambient Air Quality standards in Directives 2008/50/EC and 2004/107/EC?	No. Other than routine vessels emissions. Air Quality standards will not be exceeded.	No

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
6	Will the project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	<p>Yes. Geophysical and geotechnical surveys use acoustic technology and emit underwater noise. All surveys will also generate vessel noise.</p>	<p>No.</p> <p>In line with the findings of the Applicant’s NIS, the geotechnical surveys will result in sound levels which will not cause injury to any species present. Any noise generated will be expected to attenuate rapidly to background levels (characterised by ambient environmental noise and shipping noise). Some localised, temporary and intermittent disturbance and displacement of fish is likely in the immediate locality of the drilling works, but this is not expected to result in significant effects.</p> <p>A study by Bach <i>et al.</i>, 2013 concluded that even substantially higher noise levels (when compared to the geotechnical works being considered here) associated with offshore oil and gas platforms and drilling activities do not pose a significant threat to small high frequency cetaceans such as harbour porpoise.</p> <p>Low frequency cetaceans (baleen whales) and pinnipeds would be the most susceptible to the low frequency associated with drilling activity. However, low frequency cetaceans are not commonly encountered within the Foreshore Licence area, and density</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
			<p>estimates are considered very low, as such even these more sensitive species are unlikely to be significantly affected. With regard to pinnipeds (all of which hear in the low frequency range), although a level of localised disturbance may result this is expected to be minimal and the noise created by the geotechnical boreholes predicted are below injury threshold values and therefore injury is highly unlikely.</p> <p>Geophysical investigations, have been reported to produce sound at frequencies and at sound pressure levels exceeding 190-220 dB re: 1 µPa.</p> <p>It is likely that some fish and marine mammal species will perceive noise from the UHRS system in close proximity to the noise source. Given the rapid attenuation of noise levels with distance from the source, the short duration and limited spatial extent of the UHRS survey the effect on fish and marine mammal species from the proposed survey work is considered to be negligible.</p> <p>Mitigation measures in line with DAHG Guidance or other updated guidance as agreed with the National Parks and Wildlife Service (NPWS) will be implemented to</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
			<p>minimise the impact of the geophysical and geotechnical operations on sensitive receptors the key requirements being use of marine mammal observers (MMO), pre start monitoring, ramp up procedures and break in outputs, as outlined in Appendix A. The operations will be undertaken in an area already extensively used by commercial and recreational craft.</p> <p>Noise generated from ecological and metocean monitoring activities will be limited to vessel noise only. The operations will be undertaken in an area already extensively used by commercial and recreational craft.</p>
7	<p>Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?</p>	<p>No: See Q3</p>	<p>No. See Q3. The survey vessels and those engaged to deploy monitoring equipment will comply with normal vessel operating standards and with the MARPOL Convention on Marine Pollution and the Sea Pollution Acts. Mandatory measures will ensure the risk of a release is low and that a significant effect is unlikely.</p>
8	<p>Will there be any risk of accidents during construction or operation of the project which could affect human health or the environment?</p>	<p>Yes. The proposed surveys will involve activities on the survey vessels at sea, when undergoing survey operations, the vessels will be travelling at slow speeds and also be stationary for a large portion of the time. There is therefore an increased risk of vessel to vessel collision.</p>	<p>No. Mitigation measures will be in place to ensure any risk will be minimal and will include publication of a formal Marine Notice, display of lights, shapes and other internationally recognised identification or warning signals on survey vessels,</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
			communication protocol with the Dublin Harbour Master/VTS and compliance with all requirements of the International Regulations for Preventing Collisions at Sea. Further details see Appendix A.
9	Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?	No. Given the temporary nature of the project and level of existing shipping activity in the area, no social changes are predicted.	No
10	Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?	<p>Yes. There are proposals for other offshore wind farms and associated site investigations and monitoring programmes to both the north and south of the study area. There is potential for cumulative impacts with other surveys. Certain survey work has already been carried out pursuant to a foreshore licence issued to RWE and there are existing buoys in situ.</p> <p>There are no consequential developments of which we are aware. In due course, the application for the construction and operation of Dublin Array Wind Farm, which will be subject to EIA and Appropriate Assessment, will be determined. If consent is granted, works on the Dublin Array project would follow, but not as a consequence of the proposed survey works the subject of this licence application.</p>	No. The Applicant’s NIS and Supporting Information do not predict any significant cumulative impacts to arise as a result of the survey operations. To minimise the risk of any cumulative effects on commercial fisheries and shipping and navigation consideration will be given to co-ordination of the survey in relation to the timing of other surveys (for example Codling OWF Foreshore Licence FS007045) if such surveys are being undertaken in close proximity to one another.
11	Is the project located within or close to any areas which are protected under international, EU, or national or local legislation for their ecological, landscape, cultural or other value,	<p>Ecological: Yes. The Applicant’s NIS supporting this application screened in a number of sites within the survey area which overlap with the Offshore ECC:</p> <ul style="list-style-type: none"> ▪ South Dublin Bay SAC; ▪ Rockabill to Dalkey Island SAC; and 	Ecological: No. The Applicant’s NIS concluded that, with the implementation of the specified mitigation measures including the mitigation outlined in Q6, micro-siting of sampling locations, supervision by an

Q Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
<p>which could be affected by the project?</p>	<ul style="list-style-type: none"> ▪ South Dublin Bay and River Tolka Estuary SPA. <p>Additionally, 26 SACS and 18 SPAs were considered for the potential for Likely Significant Effect (LSE) to arise via the identified source-receptor-pathways. For five of these sites LSEs upon qualifying features resulting from physical disturbance, or noise and vessel disturbance could not be discounted and were considered further in the Applicant’s NIS (Annex F of the Application Documents).</p> <p>Cultural Heritage: Yes. There are 149 wrecks within the Foreshore Licence area and evidence of <i>in situ</i> intertidal peat beds and a submerged forest recorded within the Foreshore License area, near Bray Harbour, Co. Wicklow.</p>	<p>ecologist and reinstatement of the intertidal habitat as detailed in Appendix A of this report, the proposed development alone or in-combination with other activities and developments, would not cause an adverse effect on the integrity of any European sites.</p> <p>Landscape: No. The proposed array area and Offshore ECC are not subject to international, national or regional designation intended to protect landscape quality. As outlined in Q15, onshore landscape designation exist but any visual effect will be limited to the presence of survey vessels on site in an area already characterised by a number of high density vessel routes passing to the west and north of the site.</p> <p>Cultural Heritage: No. The most up to date geophysical survey data will be interpreted to identify the location of any wrecks or other potential cultural heritage features, which will be avoided by the intrusive survey activities. With the implementation of the specified mitigation measures (See Appendix A), no significant effects on underwater or intertidal archaeology are likely.</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
			<p>Other value: Dublin Bay Biosphere reserve was recognised in 1981 and expanded in 2015 to reflect its significant environmental, economic, cultural and tourism importance. The visual effect of the survey activities will be limited to the presence of survey vessels on site in an area already characterised by a number of high density vessel routes passing to the west and north of the site.</p> <p>No other designations protected under international, EU, or national or local legislation exist within the area defined in the Foreshore Licence application.</p>
12	<p>Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, which could be affected by the project?</p>	<p>Yes. There are a variety of waterbodies that fall outside of designated European sites but support migratory bird and fish species that may be recorded within the Dublin Array area at certain times of the year and other habitats of ecological importance.</p>	<p>No. With the implementation of the specified mitigation measures as outlined in Q6 and Q11 and detailed within Appendix A, the proposed development is not likely to result in a significant effect on the ecology of the coastal zone or other waterbodies.</p>
13	<p>Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?</p>	<p>Yes. European sites on or around the area of the proposed development are listed in Q11.</p> <p>Several species of fish are known to spawn in the vicinity of the proposed Foreshore Licence area, namely lemon sole (<i>Microstomus kitt</i>), sprat (<i>Sprattus sprattus</i>), plaice (<i>Pleuronectes platessa</i>), sole (<i>Solea solea</i>), whiting</p>	<p>No. With the implementation of the specified mitigation measures (See Q6 and Appendix A) in relation to minimising disturbance and noise, the proposed development is not likely to cause a significant adverse effect on any sensitive species of fauna or flora.</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
		<p>(<i>Merlangius merlangus</i>), cod (<i>Gadus morhua</i>), mackerel (<i>Scomber scombrus</i>) and the Norwegian lobster (<i>Nephrops norvegicus</i>) (Coull <i>et al</i>, 1998 and Ellis <i>et al</i>, 2012). With the exception of plaice, all spawning is recorded as being of low intensity. The nursery areas which occur in the vicinity include those for cod, haddock (<i>Melanogrammus aeglefinus</i>), herring, lemon sole, nephrops, plaice, whiting, mackerel and horse mackerel (<i>Trachurus trachurus</i>) (Coull <i>et al</i>, 1998) and sandeel (Ellis <i>et al</i>, 2012 and Marine Institute, 2020). With the exception of cod and whiting, all nursery grounds are recorded as being of low intensity.</p>	
14	<p>Are there any inland, coastal, marine or underground waters (or features of the marine environment) on or around the location that could be affected by the project?</p>	<p>Yes. The application area comprises intertidal and subtidal waters. Refer to Q11 and Q12 above.</p>	<p>No. With the implementation of the specified mitigation measures (See Q11 and Appendix A), the proposed development is not likely to cause a significant adverse effect on coastal and marine waters.</p>
15	<p>Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?</p>	<p>Yes. The proposed array area and Offshore ECC are not subject to international, national or regional designation intended to protect landscape quality; however a number of landscape designations exist along the east coast of Ireland. Of particular importance are the Wicklow National Park, the Wicklow Mountains and Lakeshore Area of Outstanding Natural Beauty (AONB) and the Wicklow Coast AONB.</p>	<p>No. The visual disturbance will be limited to the presence of survey vessels on site. The area is characterised by a number of high density vessel routes passing to the west and north of the site, which are in the majority associated with transiting into and out of Dublin Bay (and associated ports and harbours). This includes regular passenger and freight ferry routes, fishing (actively fishing and in transit) and recreational traffic.</p>
16	<p>Are there any routes or facilities on or around the location which are used by the public for access to recreation or</p>	<p>Yes. The inshore waters are used by recreational craft. The potential landfall sites are used for recreation.</p>	<p>No. During the survey operations other vessels will be requested to maintain a safe distance from survey vessels due to the</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
	other facilities, which could be affected by the project?		restricted manoeuvrability of the survey vessels. This disruption will be temporary and there are alternative areas for these craft. The intertidal and subtidal shoreline surveys at the landfalls will be of very short duration, and will have minimal effect on any recreational activity.
17	Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	<p>No. As stated in Q8 and Q15 the surrounding marine area has a number of high density vessel routes passing to the west and north of the site, which are in the majority associated with transiting into and out of Dublin Bay (and associated ports and harbours). This includes regular passenger and freight ferry routes, fishing (actively fishing and in transit) and recreational traffic. Increase in onshore vehicle traffic will be negligible. The larger offshore vessels will have a crew of approximately 20 personnel with crew changes occurring infrequently. The smaller vessels returning to port daily will have much smaller crew numbers, approximately 8. Intertidal surveys at the landfalls require access to the beach for machinery which will be either lowered to the beach by crane from Shellybanks Road or brought to shore by boat. Neither option would arise in traffic congestion.</p>	<p>No. As detailed in Q8, mitigation measures (See Appendix A) will include formal marine notice, appropriate navigation lights and liaison with ports, marinas and sailing clubs.</p> <p>Any disruption will be temporary and short term for both onshore (where access required) and offshore elements of the surveys.</p>
18	Is the project in a location where it is likely to be highly visible to many people?	<p>Yes. There are many vantage points along the coastline and many popular recreational areas, from which the application area is visible.</p>	<p>No. Given the temporary nature of the surveys and existing baseline of vessel activity, the presence of vessels and floating buoys will not present a visual impact.</p>
19	Are there any areas or features of historic or cultural importance on or	<p>Yes. Refer to Q11.</p>	<p>No. Refer to Q11 and Appendix A for appropriate mitigation measures.</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
	around the location which could be affected by the project?		
20	Is the project located in a previously undeveloped area where there will be loss of greenfield land?	No	No
21	Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?	Yes. The inshore waters are used by recreational craft, fishing and shipping. Refer to Q16 and Q17 and Q25.	No. Refer to Q16 and Q17.
22	Are there any plans for future land uses on or around the location which could be affected by the project?	No. The area lies offshore and is subject to the National Marine Planning Framework (DHLGH, July, 2021).	No.
23	Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	No	No likely significant impact anticipated
24	Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?	No	No likely significant impact anticipated

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
25	<p>Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?</p>	<p>Yes. Initial consultation (undertaken to inform the Dublin Array EIA) indicated that the regional fishing fleet is characterised by approximately 30 vessels operating across the survey area, as well as targeting other ground across the region. This includes, but is not limited to, vessels based at the following ports (from north to south):</p> <ul style="list-style-type: none"> ▪ Howth; ▪ Dún Laoghaire; ▪ Greystones; ▪ Wicklow; and ▪ Arklow. <p>Inshore potting for whelk occurs across the Offshore ECC area.</p> <p>There are low levels of pelagic trawling and little or no demersal trawling. Recreational angling, with both shore and boat-based angling carried out along this coastline.</p>	<p>No. Mitigation measures (see Appendix A) will be in place to ensure any disruption to fishing activity is kept to a minimal. To avoid damage to static fishing gear and to allow safe access of the geophysical survey vessel to the sampling locations, static gear will be required to be removed. The impact upon the commercial fishing sector will be minimised by planning of the survey to minimise the spatial extent and duration of gear removal necessary. The effect on static gear fisheries will be limited and of short duration.</p> <p>In addition, a Fisheries Liaison Officer was appointed by RWE in May 2019 and will continue to liaise with the fishing industry to enable planning of the survey to minimise disruption.</p>
26	<p>Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?</p>	<p>No</p>	<p>No likely significant impact anticipated</p>
27	<p>Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or</p>	<p>Yes. The proposed development location is susceptible to fog and severe weather conditions.</p>	<p>No. The survey vessels and static equipment will be operated in accordance with the weather limitations likely to be experienced</p>

Q	Brief Project description	Answer to checklist question (Yes/No)	Is this likely to result in a significant impact? (Yes/No – Why)
	adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?		and environmental impacts are not likely to result as a consequence. The mitigation measures proposed as detailed in Q8 and Appendix A will minimise the potential for impact.

4 Environmental appraisal

- 4.1.1 GoBe Consultants Ltd undertook an appraisal of the environmental effects of the proposed surveys based on the information provided in the Supporting Information Report against the EU Guidance on EIA Screening checklist (see Table 2). The appraisal was informed by the Report to inform AA Screening and Applicant's NIS undertaken in compliance with the Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) adopted in 1992 and transposed into Irish Law by the European Communities (Birds and Natural Habitats) Regulations 2011 as amended (S.I. No. 477 of 2011) (the Habitats Regulations) and the Planning and Development Act (as amended). The AA screening and preparation of the Applicant's NIS have been undertaken to document a preliminary evaluation of the potential effects of the proposed works upon European sites and identify effect-pathways for which an appropriate assessment is required against the Conservation Objectives of relevant European sites (those that could be significantly affected), (Report to inform AA screening) and Applicant's NIS form Annex E and Annex F of the Foreshore Licence Application Documents respectively).
- 4.1.2 Consideration has also been given to the findings and objectives within the National Marine Planning Framework (DHLGH, 2021) and the Strategic Environmental Assessment for the Offshore Renewables Energy Development Plan (DHLGH, 2021).

4.2 Commercial and recreational fishing

- 4.2.1 As outlined in the Supporting Information Report, the species landed in the highest quantity across the Foreshore Licence application area and wider fishing area⁵ is whelk with the regional fishing fleet characterised by approximately 30 vessels operating off the East coast (including amongst other areas, the area which is the subject matter of this application). This includes vessels based at the following ports (from north to south): Howth, Dún Laoghaire, Greystones, Wicklow, and Arklow.
- 4.2.2 A dredge fishery targeting queen scallop is noted in the region adjacent to and slightly overlapping the south east portion of the geophysical and geotechnical survey areas, towards Shanganagh Cliffs. Scallop dredging also takes place to the east of the Kish and Bray Banks. No beam trawl activity has been found to occur across the Foreshore Licence application area.

⁵ The location of the proposed Licence area is within the Irish Sea within International Council for the Exploration of the Seas (ICES) rectangle 35E4 and 35E3

- 4.2.3 During the geophysical and geotechnical survey operations, the deployment of monitoring buoys and during mobile ecological surveys, other vessels will be requested to maintain a safe distance from survey vessels due to the restricted manoeuvrability of the latter. It will be necessary for the fishermen to avoid the static survey equipment once deployed, which will have a very small footprint.
- 4.2.4 For the duration of the geophysical survey fishermen with static gear such as whelk/lobster/crab pots which typify the activity in the area will be asked to remove their posts. The impact upon the commercial fishing sector will be minimised by planning of the survey to minimise the spatial extent and duration of gear removal necessary. The resulting effect on static gear fisheries will be very small and of short duration.
- 4.2.5 Given the presence of alternative fishing grounds available in the wider area and as the surveys and any disruption will be temporary and short term, the effect on commercial static gear fisheries and recreational fishing is expected not to be significant in EIA terms. Fisheries Liaison Officers will be employed to liaise with the fishing community to minimise disruption.

4.3 Shipping and navigation

- 4.3.1 The key navigational features in the area are considered to be the shallow banks within the site (Kish and Bray) given that they dictate vessel routeing in the area. Given the shallow water depths associated with the Kish and Bray Banks (on which the project is sited), larger commercial vessels currently avoid the project area, with only smaller fishing or recreational vessels transiting through the proposed site.
- 4.3.2 While commercial traffic does currently avoid the banks, the surrounding area has a number of high density vessel routes passing to the west and north of the site, which are mostly associated with transiting into and out of Dublin Bay (and associated ports and harbours). This includes regular passenger and freight ferry routes, fishing (actively fishing and in transit) and recreational vessels.
- 4.3.3 The potential effects on commercial shipping include an increased risk of collision with the static survey equipment and with the survey vessels. Up to two geotechnical vessels will be engaged to undertake the geotechnical survey. They will typically be travelling at slow speeds and will also be stationary for a large portion of the time (approximately 6 hours at a CPT location, 36 hours at a nearshore borehole location and 48 hours at an offshore borehole location). A buoy laying tender or multi-CAT will be used to deploy the SAM. The vessel will travel to the required location and remain stationary whilst the mooring and monitoring equipment is deployed.
- 4.3.4 During the survey and deployment operations the vessels will display lights, shapes and other internationally recognised identification or warning signals. Other vessels will be requested to maintain a safe distance from survey vessels due to their restricted manoeuvrability.

- 4.3.5 The final location of the SAM will be determined to ensure that they are clear of the main shipping channels into and out of Dublin Port. The main east-west shipping route has been identified from AIS data and has been identified as an exclusion area for SAM. This exclusion area shown in Figure 1 and will be reviewed and updated as necessary in consultation with Dublin Port and relevant commercial operators prior to agreeing final SAM locations.
- 4.3.6 Mitigation measures will be in place to ensure compliance with the International Regulations for Preventing Collisions at Sea and standards, including a formal marine notice, appropriate navigation lights and liaison with Port authorities to agree the timing of works in the vicinity of the Traffic Separation Scheme (a maritime traffic-management route-system regulated by the International Maritime Organization) and to agree a communication protocol. As the surveys and disruption will be temporary and short term, the effect on commercial shipping is expected not to be significant.

4.4 Other recreational users

- 4.4.1 Other marine leisure clubs and groups active in the area include sailing, rowing clubs various sea scouts groups, sea angling, swimming, diving and sub aqua clubs. Other tourism related activities offered in Dublin Bay include sea kayaking tours, stand up paddle boarding and kitesurfing.
- 4.4.2 The surveys will be temporary and short term and the effect on recreational users is expected not to be significant.

4.5 Natura 2000 sites

- 4.5.1 There are a number of designated subtidal habitats that are associated with Natura 2000 sites within the Foreshore Licence application area identified within the Applicant's NIS. Twenty six SACs and eighteen SPAs were considered for the potential for LSE to arise via the identified source-receptor-pathways. The Appropriate Assessment Screening assessment found that it is not possible to discount LSE with respect to three SACs and two SPAs these are:
- ▲ Rockabill to Dalkey Island SAC [003000];
 - ▲ South Dublin Bay SAC [000210];
 - ▲ Lambay Island SAC [000204];
 - ▲ South Dublin Bay and River Tolka Estuary SPA [004024]; and
 - ▲ North Bull Island SPA [004006].
- 4.5.2 The pathways for which LSEs could not be discounted for these five sites were limited to potential disturbance effects upon Qualifying Interests (Qis) resulting from physical disturbance, or noise and vessel disturbance.

- 4.5.3 A Report to Inform Appropriate Assessment Screening and The Applicant's NIS are submitted with the Foreshore Licence application (Annex E and Annex F respectively). The Applicant's NIS concluded that, with the implementation of the specified mitigation measures, the proposed development alone or in combination with other activities and developments, would not cause an adverse effect on the integrity of any Natura 2000 site.

4.6 Marine mammals

- 4.6.1 A review of existing data sources indicates that the key species likely to be present within the proposed development and surrounding area are harbour porpoise (*Phocoena phocoena*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). Other species have been recorded in the area, including minke whales (*Balaenoptera acutorostrata*), bottlenose dolphins (*Tursiops truncatus*), Risso's dolphins (*Grampus griseus*) and common dolphins (*Delphinus delphis*), however they are not commonly encountered, and density estimates are considered very low.
- 4.6.2 The geophysical surveys include multibeam echosounders, sidescan sonar, sub bottom profilers, ultra-high resolution seismic, all of which use acoustic technology resulting in underwater noise. DAHG (2014) also states that geophysical survey methods have the potential to produce significant levels of anthropogenic sound in water depending on the survey methods used, with large surveys utilising seismic airgun arrays resulting in the highest level of risk. For smaller surveys, similar to the surveys proposed in this application, the level of impact is dependent on a number of factors including the type of the equipment being used, its sound signal and propagation characteristics, and the depth in which it is operating. Geophysical acoustic instruments are known to produce sound at a range of frequencies within the range of marine mammal hearing.
- 4.6.3 Drilling activity is common in coastal and marine construction and infrastructure works and the scale of drilling activity and associated acoustic output can be very variable depending on the type, drill diameter, depth and seabed geology/composition. The DAHG (2014) guidance acknowledges that drilling from these types of sources generally produces moderate levels of continuous omnidirectional sound at low frequency (several tens of Hz to several thousand Hz and up to c.10 kHz). However, the DAHG (2014) guidance does not refer to potential impacts from geotechnical borehole operations which are of much smaller scale (in terms of core depth and diameter) than that which would usually be required as part of construction of oil and gas operations (Kyhn, 2014; Green and Charles, 1987). A study by Bach *et al.*, 2013 concluded that even the substantially higher noise levels (when compared to the geotechnical works being considered here) associated with offshore oil and gas platforms and drilling activities do not pose a significant threat to small high frequency cetaceans such as harbour porpoise.

- 4.6.4 Underwater noise can result in induced stress, and behavioural changes such as displacement from feeding, resting or breeding grounds (DAHG, 2014). Physical effects may range from a temporary and reversible reduction in hearing sensitivity (Temporary Threshold Shift (TTS)), permanent hearing damage (Permanent Threshold Shift (PTS)) or even in extreme cases, death. The potential for impact was considered within the Applicant's NIS assessment (referencing Southall *et al*, 2007 noise exposure criteria and subsequent update Southall *et al*, 2019), which concluded that the potential for injury can be ruled out, and any possible disturbance from the works would be contained within the very limited local disturbance from the presence of vessels.
- 4.6.5 Given that any noise impacts on cetaceans, pinnipeds and their prey would be short term, temporary and intermittent and the best practice mitigation measures for the geophysical and geotechnical surveys as specified in the DAHG Guidance (2014) or other updated guidance as agreed with NPWS will be followed at all times, the potential for disturbance to marine mammals will be minimised. No significant effects are predicted.

4.7 Birds

- 4.7.1 Ireland is internationally important for breeding bird populations. For two species, European storm-petrel (*Hydrobates pelagicus*) and roseate Tern (*Sterna dougallii*), more than 10% of the biogeographical populations are found breeding in Ireland, while significant numbers of great cormorant (*Phalacrocorax carbo*) and Manx shearwater (*Puffinus puffinus*) also breed.
- 4.7.2 There are several seabird species that have been identified in Dublin Array site survey reports undertaken to inform the EIA for construction and operation of Dublin Array. The key species include Manx shearwater, gannet, shag, herring gull, great black backed gull, kittiwake, little gull, common tern, Arctic tern and roseate tern and the auks; guillemot and razorbill.
- 4.7.3 The inshore extent of the Foreshore Licence area falls within the South Dublin Bay and River Tolka Estuary SPA, which supports an internationally important population of light-bellied Brent goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding common tern and is an important staging/passage site for a number of tern species (roseate tern, common tern and Arctic tern) in the autumn (mostly late July to September).
- 4.7.4 The potential impacts on birds from the proposed works are considered to be disturbance due to increased vessel activity, underwater noise and intertidal survey activity. Effects on supporting habitat and prey will be temporary and highly localised. Therefore, impacts due to effects on prey species will be negligible.

- 4.7.5 A proportion of the proposed survey works area overlaps with the South Dublin Bay and River Tolka SPA. The Applicant's NIS concluded that impacts upon supporting habitats are expected to be *de minimus*, however, noise and disturbance would be generated from the survey activities producing source-pathway-receptor links between the works and the European site. There is a potential for localised disturbance of roosting birds within these intertidal areas should the works overlap temporally with their presence.
- 4.7.6 Of the key species in the area, herring gull, little gull and great black-backed gulls are not considered sensitive to boat traffic (Garthe and Hüppop, 2004; Furness and Wade, 2012). Furness and Wade (2012) rank gannet, kittiwake and Manx shearwater as having low vulnerability to disturbance by ship traffic. Disturbance effects on these species are therefore considered to be negligible,
- 4.7.7 Fliessbach *et al.*, (2019) found common tern and Arctic tern to have very low vulnerability to vessel disturbance, in fact, both of these species breed on man-made structures within Dublin docks in the summer months (NPWS, 2015). Roseate turns are also considered to have low vulnerability to vessel disturbance (Furness *et al.*, 2013).
- 4.7.8 Shag, guillemot and razorbill are considered to display moderate escape behaviour (Garthe and Hüppop, 2004; Furness and Wade, 2012) and may therefore be disturbed by vessel activity. However, as the geotechnical survey vessels will be operated at slow speeds and will also be stationary for a large portion of the time the impacts of vessel disturbance will be negligible.
- 4.7.9 The nature of the works and noise effects would be short term, temporary and localised in nature with no significant effects predicted for any bird species. The intertidal area and wider coastline is in close proximity to a high amenity area and the species present would be accustomed to a high level of noise and visual disturbance. Nonetheless mitigation measures outlined in Appendix A will be implemented to minimise disturbance to birds present across the intertidal, with additional measures in place at Poolbeg where works overlap with South Dublin and River Tolka Estuary SPA.

4.8 Fish and shellfish ecology

- 4.8.1 Seven species of fish are known to spawn in the vicinity of the proposed Foreshore Licence area, namely lemon sole (*Microstomus kitt*), sprat (*Sprattus sprattus*), plaice (*Pleuronectes platessa*), sole (*Solea solea*), whiting (*Merlangius merlangus*), cod (*Gadus morhua*) and the Norwegian lobster (*Nephrops norvegicus*) (Coull *et al.*, 1998). With the exception of plaice, all spawning is recorded as being of low intensity. The nursery areas which occur in the vicinity include those for cod, haddock (*Melanogrammus aeglefinus*), herring, lemon sole, Nephrops, plaice, whiting (Coull *et al.*, 1998) and sandeel (Ellis *et al.*, 2012). With the exception of cod and whiting, all nursery grounds are recorded as being of low intensity.

- 4.8.2 The Applicant's NIS also considered potential for impact on migratory fish species, with particular focus on the impacts of noise from the geophysical and geotechnical surveys. The nearest designated salmonid rivers to the geophysical and geotechnical boundary defined in the Foreshore Licence application area are approximately 50 km to the north, and 95 km to the south (Boyne River SAC and Slaney River SAC respectively). However, migratory fish are known to have a temporal or spatial overlap with the proposed Foreshore Licence application area, although no SACs for migratory fish species are present. River systems flowing into Dublin Bay (the River Liffey, River Tolka and River Dodder) are reported to support sea trout (*Salmo trutta*). Atlantic Salmon (*Salmo salar*) are known to occur within the River Liffey, whilst the Dodder and Tolka also support smaller populations (Holmes *et al.*, 2018). Sea trout (CSTP, 2016) and salmon (Holmes *et al.*, 2018) have also been reported in the River Dargle which flows through Bray (approximately 10 km southwest of the proposed geophysical and geotechnical boundary). European eel (*Anguilla anguilla*) has been documented in the Tolka and Liffey rivers (Holmes *et al.*, 2018) and the Lower Liffey is a migratory corridor for river and brook lamprey known to occur in the wider Liffey catchment.
- 4.8.3 The Applicant's NIS provides an assessment of noise on fish species using guidance from Popper *et al.* (2014). Underwater noise in the low frequency range overlaps the hearing sensitivity (100 - 1000 Hz) of many fish species (Spig *et al.*, 2017 and Popper and Fay, 2011). Impacts are predicted for species that utilise sound for ontogenetic behaviours such as mate finding and courtship, as well as routine behaviours including species recognition, foraging, and predator-prey interactions (Codarin *et al.*, 2009, Picciulin *et al.*, 2010, Purser and Radford, 2011, Bracciali *et al.*, 2012, Voellmy *et al.*, 2014, Shannon *et al.*, 2016, Simpson *et al.*, 2015).
- 4.8.4 Shellfish do not possess gas filled cavities and there is therefore less potential for physiological damage to occur due to noise exposure as there is no mechanism for marine invertebrates to detect pressure changes associated with sound waves. However, whelk in common with some other invertebrates may be able to detect particle motion associated with sound waves. Due to the mobile nature and short duration of the acoustic surveys exposure to particle motion will be temporally limited.
- 4.8.5 The Applicant's NIS concluded that the risk of injury was defined as low for the noise generated by the geophysical and geotechnical surveys, as there will only be notable effects in the near-field from the source, while in the far-field there will be very low-level effects.

- 4.8.6 For the geotechnical works, the risk of fatal injury was defined as low regardless of the distance from the source, consequently it is considered that the drilling works proposed will not result in any mortality or mortal injury to fish. The risk of injury was also defined as low for the noise generated by the geophysical works, as there will only be notable effects in the near-field from the source, while in the far-field there will be very low-level effects. Studies suggests that peak sound pressure levels at 500 m distant from the source of airguns are below the threshold for causing injury or mortality, with fish struggling to even “feel” the particle motion during the survey (Amaral *et al.*, 2018). As the proposed works are expected to use a lower intensity of equipment compared to the seismic airguns used by Amaral *et al*, it is therefore considered likely that there is no risk of injury or mortality to fish from the proposed works.
- 4.8.7 In addition, the area affected by increased noise levels from survey activities is very small in relation to the surrounding widespread environment and habitats available. Any noise generated will be expected to attenuate rapidly to background levels (characterised by ambient environmental noise and shipping noise) although some localised, temporary and intermittent disturbance and displacement of fish is likely in the locality of the surveys, this is not expected to result in significant effects.
- 4.8.8 Direct loss of habitat as a result of the seabed footprint of vessel spud leg sampling equipment and moorings can result in effects on supporting habitat for fish and shellfish populations. The area of seabed disturbance arising from the geotechnical, ecological sampling, and deployment of buoy moorings is 50.88 m². In addition, for all the geotechnical locations, the boreholes may be drilled from a jack up barge, there will be an additional area, approximately 15 to 20 m² of seabed disturbance/location within the footprint of the steel frame and jack-up vessel spud-legs with an additional 4260 m² of temporary disturbance, which equates to 3.7% of the total Foreshore licence area. The area of seabed impacted is likely to recover quickly. Effects on fish and shellfish populations due to direct loss of habitat will therefore be temporary and highly localised.
- 4.8.9 Survey techniques also have the potential to result in increased sediment concentrations which can have an effect on fish and shellfish populations. Any sediment mobilised during the works will settle quickly in the immediate vicinity of the sampling location. As there will be no significant impact on the seabed from the proposed works, any displacement is considered unlikely to cause any impacts on fish or shellfish populations.

4.9 Benthic and intertidal habitat

- 4.9.1 Data from existing studies confirms that the Kish and Bray Banks are two interconnected sandbanks characterised by sand, shell, gravel and cobble sediments. To the east of the sandbanks, the general area is characterised by a large expanse of sand and areas of sand and shell. The literature indicates that the benthic habitats of the Kish and Bray Banks are characterised with moderate faunal diversity and a range of biotopes depending on the sediment structure.
- 4.9.2 None of the surveys of the area carried out to-date have indicated the presence of any rare or unusual species, or benthic species of conservation importance. A site specific benthic subtidal survey (Fugro, 2021) identified areas of boulders and cobbles defined as potential stony reef⁶. The reef habitat observed ranged from 'not a reef' to 'medium reef' was located in the nearshore areas where the Offshore ECC makes landfall at Shanganagh. No other Annex I habitats or Annex II species, OSPAR threatened and/or declining species and habitats (OSPAR, 2008) were observed within the survey area (Fugro, 2021).
- 4.9.3 The intertidal area at the Shanganagh Cliff and Shanganagh Park landfall zones has been characterised (Aquafact, 2017 and 2021) and shows the upper shore consisting of a band of cobbles and pebbles with occasional boulders grading into a finer gravel and coarse sand down the shore. This zone upper to midshore was classified as 'barren littoral shingle' merging into 'barren littoral coarse sand' in the middle to lower shore a small patch of the biotope 'Lanice conchilega in littoral sand' was noted between scattered boulders, cobbles and pebbles to the north of the proposed landfall location.
- 4.9.4 The intertidal area at Poolbeg from the upper shore to the lower shore the principal biotope recorded over the majority of the survey area was classified as 'Fine sands with *Angulus tenuis* community complex. Incipient Marram grass dunes are forming in three locations in the upper shore above high water mark. Rock armour is employed throughout the upper shore survey area to counteract coastal erosion. In the Shelly Bank area the rock armour has a canopy of macroalgae and a vertical zonation of several biotopes typically found on rocky shores but compressed into narrow vertical bands.

⁶ Stony reef is defined as comprising coarse sediments with a diameter greater than 64 mm (cobbles and boulders) that provide a hard substratum.

- 4.9.5 A number of the intended survey techniques are intrusive, in that they remove or disturb a small area of seabed, namely the boreholes, vibrocores, CPTs, ecological grab samples and trawls and moorings. Seabed disturbance across the subtidal (array and Offshore ECC) from 61 boreholes across the array of approximately 254 mm diameter, up to 61 CPTs of approximately 40mm, 31 shallow CPTs (40 mm) and 48 vibrocores (150 mm diameter), up to 90 ecological grab samples (20cm) together with moorings for the SAM and Flidar and wave monitoring units will result in a total area temporary disturbance of 50.88 m² across the subtidal extents of the Foreshore licence area. Once completed, CPT, vibrocores and boreholes will be left to backfill naturally.
- 4.9.6 In addition, for all the geotechnical locations, the boreholes may be drilled from a jack up barge, there will be an additional area, approximately 15 to 20 m² of seabed disturbance/location within the footprint of the steel frame and jack-up vessel spud-legs with an additional 4260 m² of temporary disturbance, which equates to 3.7% of the total Foreshore licence area. The total area of seabed removed or disturbed across the Foreshore Licence area will be highly localised, especially when set within the context of the scale of features and physical processes present in Dublin Bay.
- 4.9.7 Within the intertidal area, disturbance will arise from up to 12 nearshore boreholes (254 mm diameter), five CPTs (40 mm) and up to 48 intertidal ecological samples. The area of intertidal affected by sampling would equate to a very small area (0.62 m²) when set within the context of the scale of the total available intertidal feature, and the area of physical disturbance would be highly localised.
- 4.9.8 The Applicant's NIS (Annex F) considered the potential for impact on benthic subtidal habitats and species resulting from a loss of habitat and disturbance to sediments. The subtidal habitats present are widespread across the wider area and the area affected will be highly localised and no significant effects were predicted.
- 4.9.9 The sub-tidal geotechnical sampling locations will be selected after review of the geophysical and environmental data collected prior to the commencement of the investigation campaign. The data will be reviewed for the presence of potential ecological features such as subtidal geogenic reef. Sampling locations will then be micro-sited where necessary to avoid ecological impacts, as a result no significant effects are predicted.

4.10 Water

- 4.10.1 The survey activities will mainly be undertaken at sea. Drilling the boreholes will use water or inert drill muds, the drilling flush and drill cuttings are largely returned to the vessel and re-used and returned to shore for disposal, however some loss of flush and cutting should be expected. All drilling fluids will be managed in compliance with environmental requirements and best practice.

4.10.2 The boreholes within the intertidal area will be grouted to within 2 m of surface of the base of mobile sediment using a 2:1 bentonite cement mix. As detailed within Table 2 bentonite is a non-toxic, inert, natural clay mineral. There will be no planned release of potentially harmful substances from the survey vessels. Strict maritime regulations, normal vessel operating standards and precautions will ensure the risk of a release is low and no significant effects are predicted.

4.10.3 In compliance with the WFD objectives, the proposed activities associated with the surveys are not anticipated to result in a deterioration in a designated water body (or protected area) and will not jeopardise the attainment of good status (or the potential to achieve good ecological and chemical status).

4.11 Air

4.11.1 There will be no releases to air, other than routine vessels exhausts. Air Quality standards will not be exceeded. There is not likely to be a significant effect on the environment.

4.12 Climate

4.12.1 The survey will be conducted over a relatively short timeframe and effects contributing to climate change will not arise. There is not likely to be a significant effect on the environment.

4.13 Material assets

4.13.1 There are a number of existing pipelines and cables that traverse the Offshore ECC and the surveys have the potential to result in damage to existing infrastructure due to direct impact of vessel spud cans, seabed sampling equipment or moorings. Geotechnical sampling locations and SAM will be positioned a minimum of 100 m from the as-found position of existing cables and buried pipelines or 250 m from the as-laid position if the position is not confirmed during the non-intrusive surveys. Third party asset owners will be consulted prior to survey works commencing.

4.13.2 Furthermore, the mitigation measures outlined in Appendix A will ensure the risk of impact upon seabed infrastructure to be considered negligible with no significant effects predicted.

4.14 Cultural heritage

4.14.1 There are a number of wrecks in the application area including 24 known wrecks, i.e which have been correlated to known losses, in addition to 120 unknown wrecks. A further five uncharted wrecks have been identified from recent geophysical surveys within the Foreshore Licence area.

4.14.2 Study of the most recent available geophysical survey data will identify the location of any wrecks or other potential cultural heritage features in the survey area, which will be avoided by the intrusive survey activities. With the implementation of the specified mitigation measures no significant effects on underwater or intertidal archaeology are predicted.

4.15 Landscape and seascape

4.15.1 The array area and Offshore ECC are not subject to international, national or regional designation intended to protect landscape quality; however, a number of landscape designations exist along the east coast of Ireland. Of particular importance are the Wicklow National Park, the Wicklow Mountains and Lakeshore AONB and the Wicklow Coast AONB.

4.15.2 The visual disturbance will be limited to the presence of survey vessels on site. The area is characterised by a number of high density vessel routes passing to the west and north of the site, which are in the majority associated with transiting into and out of Dublin Bay (and associated ports and harbours). This includes regular passenger and freight ferry routes, fishing (actively fishing and in transit) and recreational traffic. No significant effects to landscape and seascape receptors are predicted.

4.16 Major accidents and disasters

4.16.1 The proposed survey works are not anticipated to exacerbate natural disasters, such as earthquakes, subsidence, landslides, erosion or flooding. It is noted that the survey area is susceptible to fog and severe weather conditions.

4.16.2 The potential for a major accident to arise as a result of the project will be minimised through mitigation measures outlined in Appendix A. With particular relevance to safety of shipping and navigation mitigation will include publication of a formal Marine Notice, lights, shapes and other internationally recognised identification or warning signals displayed on survey vessels, communication protocol with the Dublin Harbour Master and compliance with all requirements of the International Regulations for Preventing Collisions at Sea. Further details see Appendix A.

5 Conclusion of EIA screening

5.1.1 The conclusion of the EIA Screening is based on the following outlined in Table 2

- ▲ Characteristics of projects;
- ▲ Location of projects; and
- ▲ Type and characteristics of the potential impact.

5.1.2 The environmental appraisal has been undertaken based upon the Information provided in the Supporting Information Report, Report to inform AA Screening and Applicant's NIS and the Implementation of the mitigation measures proposed therein.

5.1.3 The nature, scale and location of the proposed development is such that there are no foreseeable significant effects on the environment arising from the proposed surveys. It is the conclusion of this EIA screening exercise that an EIA is not required.

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Appendix A

A Summary of mitigation measures

Benthic sub-tidal and inter-tidal habitats

- A.1.1 The inter-tidal and sub-tidal geotechnical sampling locations will be selected after review of the most up to date geophysical and environmental data. The data will be reviewed for the presence of potential ecological features such as subtidal geogenic reef. Sampling locations will then be micro-sited where necessary to avoid ecological impacts.
- A.1.2 To prevent damage to saltmarsh, and sand dune habitat, all access to the Poolbeg inter-tidal area by track machine will be supervised by an ecologist to ensure these sensitive areas are avoided. Machinery will be either lowered to the beach by crane from Shellybanks Road, or brought to shore by barge.
- A.1.3 If for any reason access by sea to the near-shore or intertidal sample locations is not possible, any temporary access arrangements or structures that are put in place to allow machinery access to the beach area should be prepared in consultation with an ecologist and the site should be fully reinstated post works;
- A.1.4 Reinstatement of the intertidal habitat will be carried out to pre-survey conditions. Spoil from boreholes would be contained and removed off site. Should the boreholes be close to the HDD cable route, the boreholes will be filled with grout to prevent weakness during drilling operations during construction. Under these circumstances the spoil will not be removed from site. Any concerns in relation to works or resulting reinstatement of the habitat to pre-construction conditions will be raised with NPWS by the project ecologist at the earliest opportunity.

Birds

Poolbeg intertidal

- A.1.5 The inter-tidal survey will be carried out outside the over-wintering period (Sept -Mar) to avoid disturbance to bird Qis of SPA.

All intertidal locations

- A.1.6 An ecologist will be present during the inter-tidal surveys to ensure disturbance is minimised and site integrity is maintained. If roosting birds are present on the shore during intertidal works, the nearby sample stations should be postponed until the birds depart, without provocation.
- A.1.7 Drift lines would contain the highest proportion of potential food source for bird species. During undertaking of the geotechnical sampling drift lines will be avoided as far as possible by machinery and personnel.

Marine mammals

- A.1.8 The mitigation measures to be carried out as part of the proposed works have been developed, following the precautionary principle and the DAHG Guidance (2014) or other updated guidance as agreed with the National Parks and Wildlife Service (NPWS), to minimise disturbance of the QI of the nearby European sites. Measures identified within the DAHG guidance are applicable for all geophysical acoustic surveys and include:
- ▲ Marine Mammal Observers - A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals;
 - ▲ Pre start monitoring;
 - ▲ Ramp up procedure; and
 - ▲ Break in outputs.
- A.1.9 Measures identified within the DAHG guidance are applicable for all geotechnical surveys and include:
- ▲ A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals; and
 - ▲ Pre start monitoring (which must be repeated if the drilling ceases for greater than 30 min).

Commercial fisheries

- A.1.10 To avoid damage to static fishing gear and to allow safe access of the survey vessel to the sampling locations, static gear will be required to be removed. A Fisheries Liaison Officer was appointed by RWE in May 2019 and will continue to liaise with the fishing industry to enable planning of the survey to minimise disruption.

Shipping and navigation

- A.1.11 The location of SAM deployment will be determined following review of available AIS data and in consultation with Dublin Port and commercial operators prior to deployment so that the main shipping routes into and out of Dublin Port will be avoided.
- A.1.12 Arrangements will be made by the applicant for the publication of a formal Marine Notice through the Department of Transport and the notice will provide vessel and contact details together with a general description of operations and approximate dates of marine survey commencement and completion, deployment timing and location of fixed monitoring equipment.
- A.1.13 During the survey operations other vessels will be requested to maintain a safe distance from survey vessels due to the restricted manoeuvrability of the survey vessels. Lights, shapes and other internationally recognised identification or warning signals will be displayed on survey vessels.
- A.1.14 The survey vessels will comply fully with all requirements of the International Regulations for Preventing Collisions at Sea.
- A.1.15 Prior to the survey commencing discussions will be held with the Harbour Master at Dublin Port to agree the timing of works in the vicinity of the Traffic Separation Scheme and to agree a communication protocol.

Marine archaeology

Measures to avoid impact on archaeological receptors as described in Annex C of the Foreshore Licence Application documents, will be implemented. In summary these measures include:

- A.1.16 The most recent available geophysical data will be assessed ahead of any seabed impact at geotechnical, ecological sample and buoy deployment locations;
- A.1.17 The establishment of Archaeological Exclusion Zones (AEZs) around known wrecks and potential receptors, as identified in the archaeological assessment of baseline and 2021 geophysical data has been established as a 100 m or 300 m radius from a centre point of the site, or the extent of the site where needed to protect associated material and scour. Within the Foreshore License area there are 149 locations that require an Archaeological Exclusion Zone;
- A.1.18 All archaeological survey works will be licenced under the National Monuments Acts 1930-2014;
- A.1.19 A Protocol for Archaeological Discovery will be implemented to facilitate dialogue between the on-site offshore survey contractors, the project archaeologist, the applicant and the Underwater Archaeology Unit of the Department of Housing, Local Government and Heritage to mitigate the impact on unexpected archaeological discoveries;

A.1.20 Geoarchaeological assessments of deposits of archaeological potential recovered during geotechnical investigations within the study area will be undertaken. The geoarchaeological assessments will follow a Method Statement developed in consultation with the Underwater Archaeology Unit of Department of Housing, Local Government and Heritage.

Marine infrastructure

A.1.21 Geotechnical sampling and SAM deployment locations will be positioned a minimum of 100m from the as-found position of these existing cables and buried pipelines or 250m from the as-laid position if the position is not confirmed during the non-intrusive surveys.



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