

Ireland to Wales Subsea Fibre Optic Cable

**APPLICATION FOR MARITIME USAGE LICENCE UNDER THE
MARITIME AREA PLANNING ACT 2021**

**FOR MARINE SURVEY & SITE INVESTIGATION WORKS AT
Dublin Port & Dublin Bay, Dublin, CO. Dublin**

REF: LIC230016

Assessment of Impacts on the Maritime Usage (AIMU) Report

MDM

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1.0 INTRODUCTION

1.1 This Assessment of Impacts on the Maritime Usage (AIMU) Report has been prepared by McMahon Design and Management Ltd on behalf of the applicant and forms part of an application for a Maritime Usage Licence for Marine Survey and Site Investigations for cable route and landfall options traversing Dublin Bay, County Dublin from Dublin Port and between Howth to the North and Dun Laoghaire to the South.

1.2 The applicant plans to investigate the feasibility of constructing a new subsea telecoms cable system, linking Wales to Ireland, from a landfall on the northwest coast of Wales to a landfall at Dublin Port, County Dublin on the east coast of Ireland as shown in Figure 1 below.

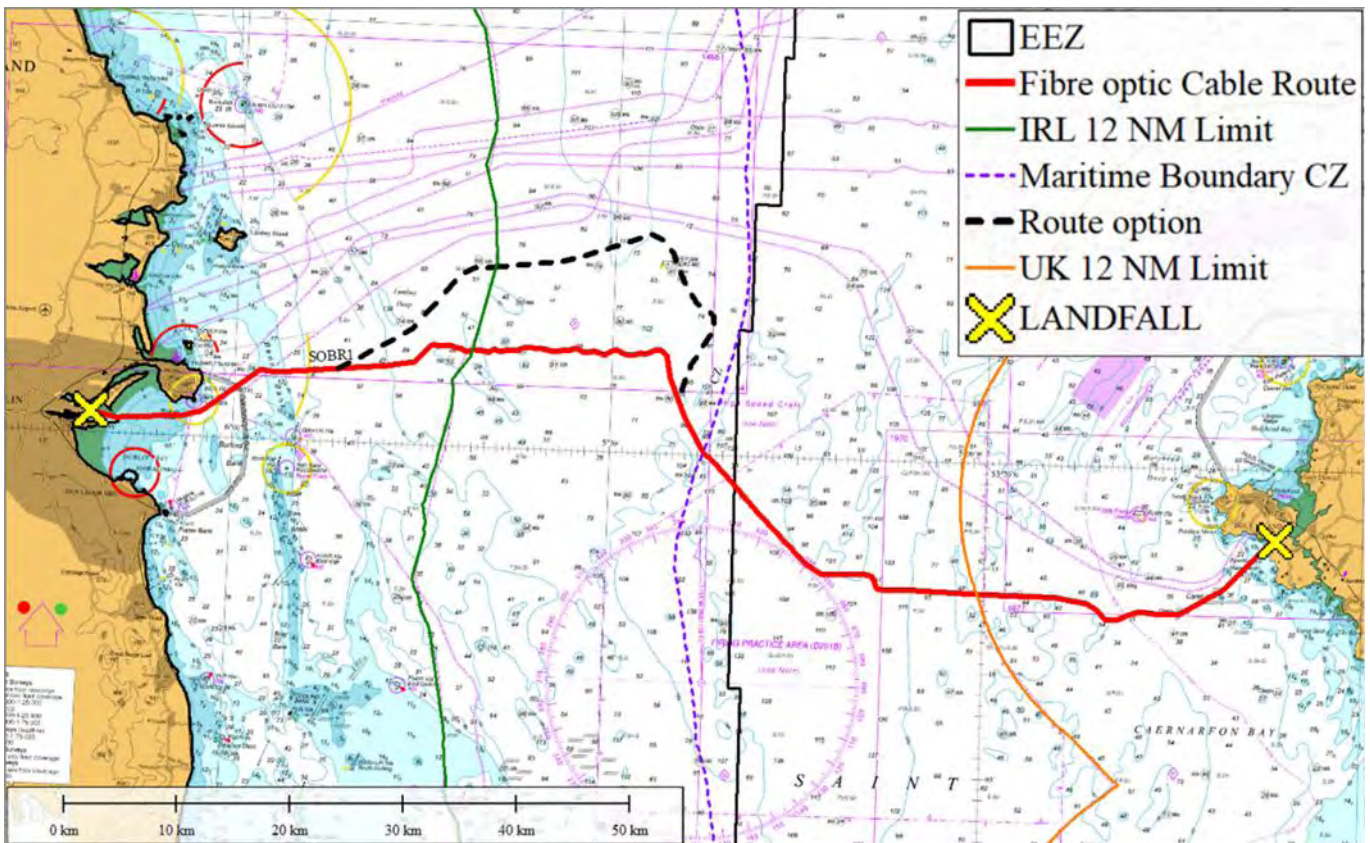


Figure 1. Telecoms Cable System (final configuration subject to change)

1.3 This report is produced in support of an application to the Maritime Area Regulatory Authority (MARA) for a licence to conduct marine survey and site investigations under Part 5 (sections 110 to 133) of the Maritime Area Planning Act (MAP) 2021, as amended, and should not be used for any other purpose apart from that expressly stated in this document.

2.0 PROJECT DESCRIPTION

2.1 The Licence Area is situated off the coast of County Dublin (Figure 2). The survey corridor has length of 115.7 km and a total area of 8054 hectares. A cable route corridor of approx. 400-1500m width will be surveyed within the Licence Area.

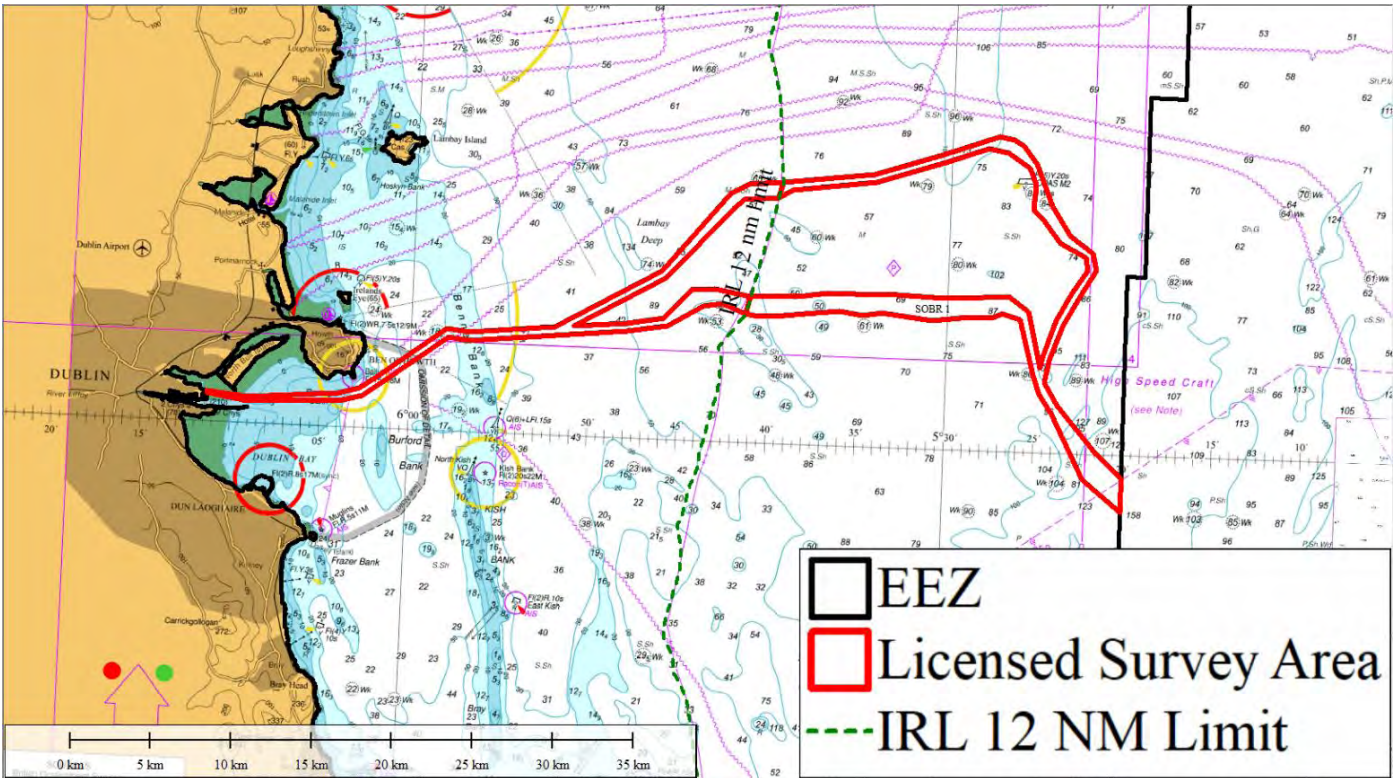


Figure 2. Map of Licence Area.

2.2 The licence application area covers a landfall close to Dublin Port, County Dublin, with survey corridors through Dublin Bay. The general location is shown in Figure 3. A more detailed overview of the route and landfalls is provided in the Programme of Works.

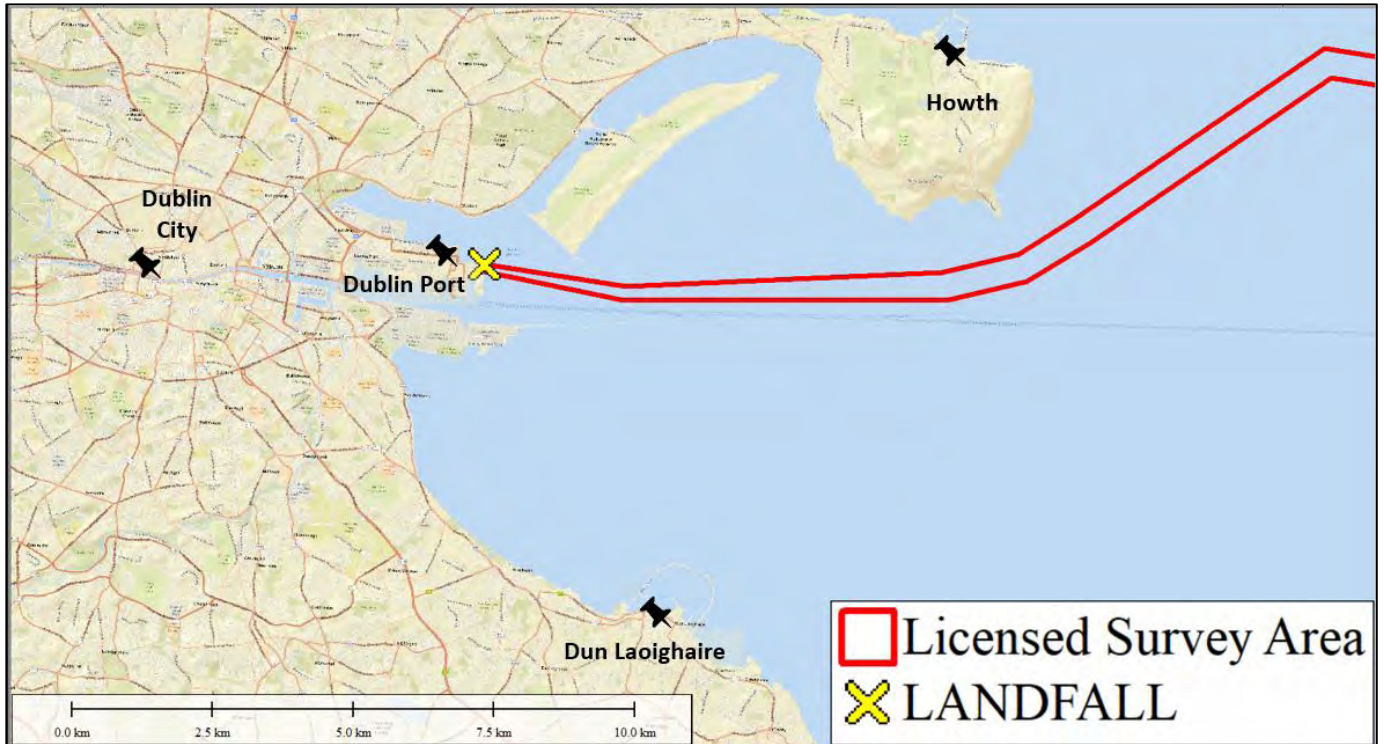


Figure 3. Landfall Location.

2.3 The principal objective of the Marine Survey & Site Investigations is to ascertain a feasible and safe route for cable system design, deployment, survivability, and subsequent maintenance with due regard for environmental and ecological considerations. The survey will also enable decisions to be made on cable armouring and burial. The survey will identify the necessary water depths, route features, seabed obstructions, seabed geomorphology and cable hazards and will also provide detailed information on the seabed sediment, subsurface stratigraphy, and upper sediment layers to support cable route and installation engineering. The site investigations will provide “ground-truthing” of the geophysical data along the route.

2.4 The objectives of the marine geophysical survey shall be:

- To collect up to date high-resolution bathymetry along a 400 – 1500m wide cable corridor within the Licence Area.
- To obtain information on the seabed surface (type, texture, variability, etc.) and, to identify any seabed features that may be of interest.
- Identify any shallow geohazards and man-made hazards (including but not limited to outcropping, boulders, shallow gas, wrecks, debris etc.).

- Determine the stratigraphy of the upper layers of the seabed along the cable route and quantify the variability in the lateral and vertical extents to depths of 2-5m.
- Identify any seabed obstructions.
- Identify sensitive marine habitats which will need to be avoided during site investigations and sampling.

2.5 The works will be carried out predominantly by remote sensing seabed mapping techniques (geophysical survey) with some selective sampling of the upper layers of the seabed (geotechnical survey). Once the results of the survey are obtained and analysed a preferred route corridor will be determined, design and method statements will be developed, and a final Route Position List (RPL) will be defined as part of a further submission for a Maritime Usage Licence for installation works.

2.6 The survey works will be carried out in accordance with the European Union (EU) Environmental Impact Assessment (EIA) Directive, Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD) and Ireland’s National Marine Planning Framework (NMPF). This AIMU report details the project’s cognizance of these Directives.

Statement of Consistency with the National Marine Planning Framework (NMPF)

2.7 The NMPF details how marine-based human activities will interact with each other and the marine environment. It is the marine equivalent of the National Planning Framework. It enables the Irish Government to “direct decision makers, users and stakeholders towards strategic, plan-led and efficient use of our marine resources” (Department of Housing, Local Government and Heritage, 2021). It brings together the various EU Directives mentioned previously to set a clear direction for managing our seas. The survey work’s adherence to EU Directives, coupled with the localised and temporary nature of the work, ensures that it will be consistent with the NMPF.

2.8 As stated in the Telecommunications chapter of the National Marine Planning Framework (March 2021), guaranteeing existing and future international telecommunications connectivity is critically important to support the future needs

of society and enterprise in Ireland. The value of the digital economy in Ireland is estimated at €12.3bn or 6% of GDP and is expected to grow significantly over the coming years. In an increasingly interconnected world, continued investment in sustainable telecommunications connectivity will be critical to ensuring that Ireland can address digital related challenges, enabling citizens to participate and benefit fully from a more integrated digital single market, improving skills, reducing the digital divide, fostering and strengthening innovation, and providing better job opportunities.

- 2.9 Recent developments at European level, including an initiative led by the Portuguese presidency – the “European Data-Gateway Platforms Strategy” as part of “Shaping Europe’s Digital Future” –outlines an increased ambition to further strengthen the international connectivity of the EU including in respect of telecommunications and subsea telecommunications connectivity. ‘2030 Digital Compass: The European way for the Digital Decade’ also sets a vision, targets, and avenues for a successful digital transformation of Europe by 2030. Europe’s digital leadership and global competitiveness is dependent on strong internal and external connectivity. In that regard, the Commission highlights the importance of improving connectivity with external partners including via subsea cables.
- 2.10 In March 2021, Minister Eamon Ryan, on behalf of Ireland, signed the Declaration on “European Data Gateways as a key element of the EU’s Digital Decade.” In doing so, Ireland joined 24 EU Member States, as well as Iceland and Norway, in committing to reinforcing digital connectivity between Europe and its global partners. The development of the new fibre optic cable system will support and enhance these policy objectives.

Statement of Consistency with the Marine Strategy Framework Directive

- 2.11 The Marine Strategy Framework Directive (MSFD) is European legislation, which aims to protect the marine environment. It requires the application of an ecosystem-based approach to the management of human activities, enabling a sustainable use of marine goods and services.
- 2.12 To implement the MSFD, Ireland is required to:
- Describe what they consider is a clean, healthy, and productive sea.
 - Monitor and assess the quality of their seas against Good Environmental Status

- Ensure they take appropriate action by 2020 to maintain or achieve Good Environmental Status.

2.13 This process started in 2012, with a review every six years. Marine Strategy Framework Directive habitat mapping was consulted during the preparation of the Ecological Impact Assessment Report (EclA) for this application.

2.14 Due to the temporary nature of the survey works, there will be no permanent or lasting change or development to the Licence Area, thus eliminating the need for a discussion of the construction, operations, maintenance, and decommissioning phases, as they will not be occurring during the survey works.

3.0 SURVEYS

3.1 The surveys to be carried out within the Licence Area are:

- Marine Geophysical Survey
- Marine Site Investigations and Seabed Sampling
- Underwater Video Survey
- Archaeology Survey

3.2 The survey works will adhere to the MSFD by remaining within the bounds of each of the 11 Descriptors in the Directive.

3.3 Table 1 below summarises the requirements and activities for the cable route survey. Further details are provided in the Works Methodology.

Survey Area	Survey Requirements
Inshore Marine Survey	Geophysical survey with a small craft or Unmanned Survey Vessel (USV) using Multibeam Echosounder (MBES), side scan sonar, marine magnetometer, and sub-bottom profile equipment.
Offshore Marine Survey	Geophysical survey with primary survey vessel or Unmanned Survey Vessel (USV) using Multibeam Echosounder (MBES), side scan sonar, marine magnetometer, and sub-bottom profile equipment.
Offshore Marine Survey	Site Investigations including Cone Penetration Tests - up to 37 No. along the route corridor to a target depth of 2m.
Offshore Marine Survey	Site Investigations including Grab Samples - up to 19 No. along the route corridor, Gravity Cores / Vibrocores - up to 33 No. along the route corridor to a target depth of 3m.
Marine Licence Application Area	Underwater Video Survey as required.

Table 1. Cable Route Survey Requirements

4.0 SURVEY METHODOLOGY

Marine Geophysical Survey

4.1 Marine Geophysical Survey will be carried out from the low water mark at each landfall with a small shallow draft survey vessel, primary survey vessel or Unmanned Survey Vessel (USV) using Multibeam Echosounder (MBES), side scan sonar, marine magnetometer, and sub-bottom profile equipment. Sub-bottom profile equipment will be able to discern the

nature and density of the upper 3 metres of seabed and will be used on a non-interfering basis with other sounding systems. A minimum of five to seven survey lines, based upon the water depth, will be run to obtain the required data coverage as indicated in Table 2.

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Inshore	3m to 15m	150 - 500m	7	SSS: 100% MBES Bathy: 20%	4 knots
Offshore	> 15m	500 - 1500m	7	SSS: 100% MBES Bathy: 20%	4 knots

Table 2 Inshore Survey.

Marine Site Investigations and Seabed Sampling

4.2 The purpose of the marine site investigations and seabed sampling is to evaluate the physical properties of the superficial seabed sediments along the cable route. These methodologies will ensure that a full understanding of the subsurface is achieved, focussing on the upper 3 metres of sediment to subsequently develop a cable burial assessment, installation, and burial plan.

4.3 The scheduled site investigations and seabed sampling within EEZ maritime limits will comprise of the following techniques:

- Up to 37 CPTs (2m to 3m)
- Up to 33 Gravity Cores / Vibrocores (3m)
- Up to 19 Grab Samples

4.4 Indicative locations for the relevant site investigation activities (Gravity or Vibrocore and CPT's) are shown in Figure 4. Typically, individual sampling positions will be determined following initial interpretation of the geophysical survey data. The positioning of individual site investigation locations will also take into consideration environmental constraints such as the position of sensitive habitats or archaeological features.

Underwater Video Survey

4.5 An underwater video camera system may be used for inspections of the seabed to investigate seabed obstructions, marine archaeology, or benthic habitats. An underwater drop-down camera system or similar may be used in a series of video transects which would be georeferenced and later mapped in GIS.

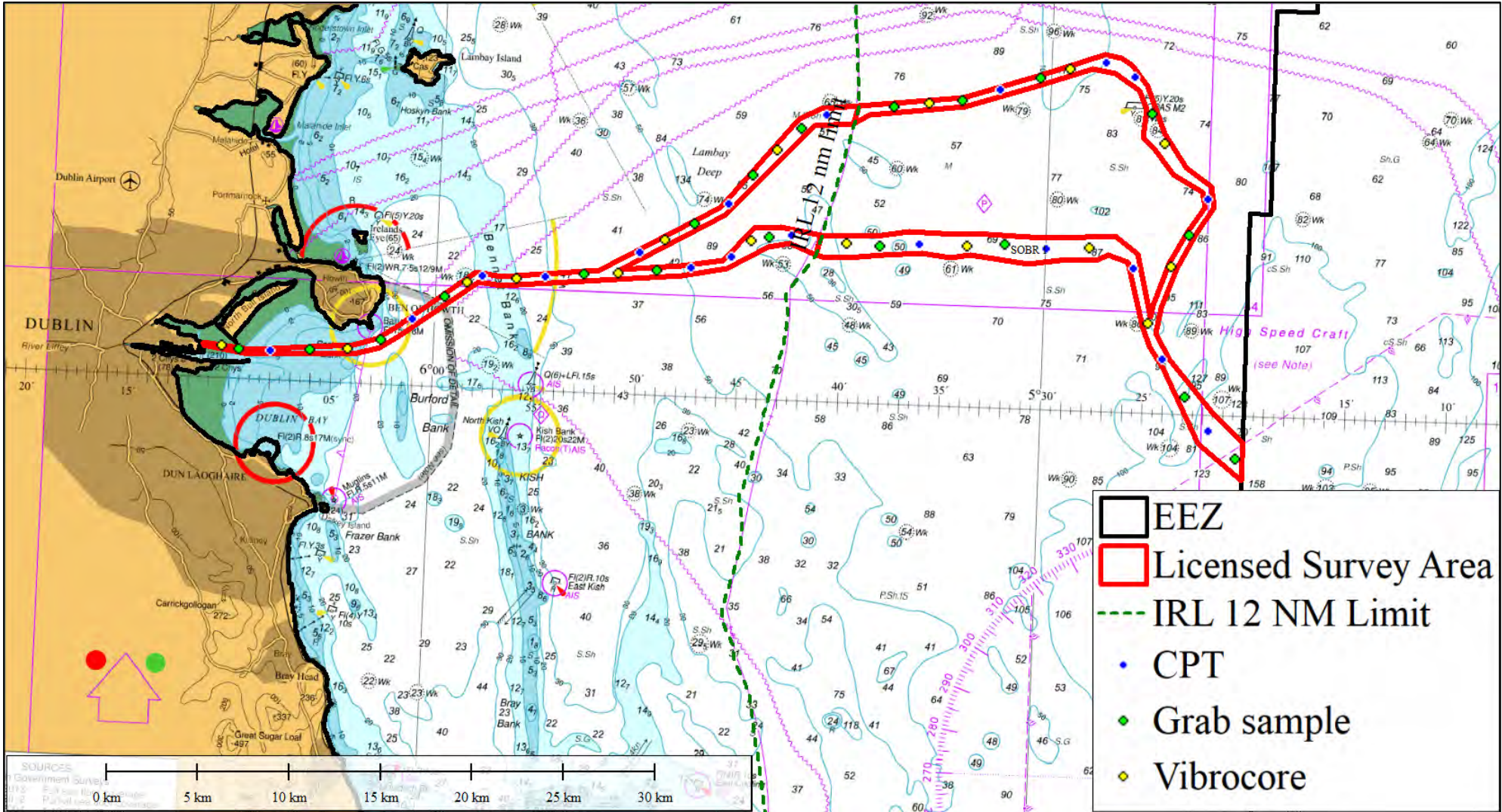


Figure 4. Indicative CPT, GS, and Vibrocore Locations (1/3)

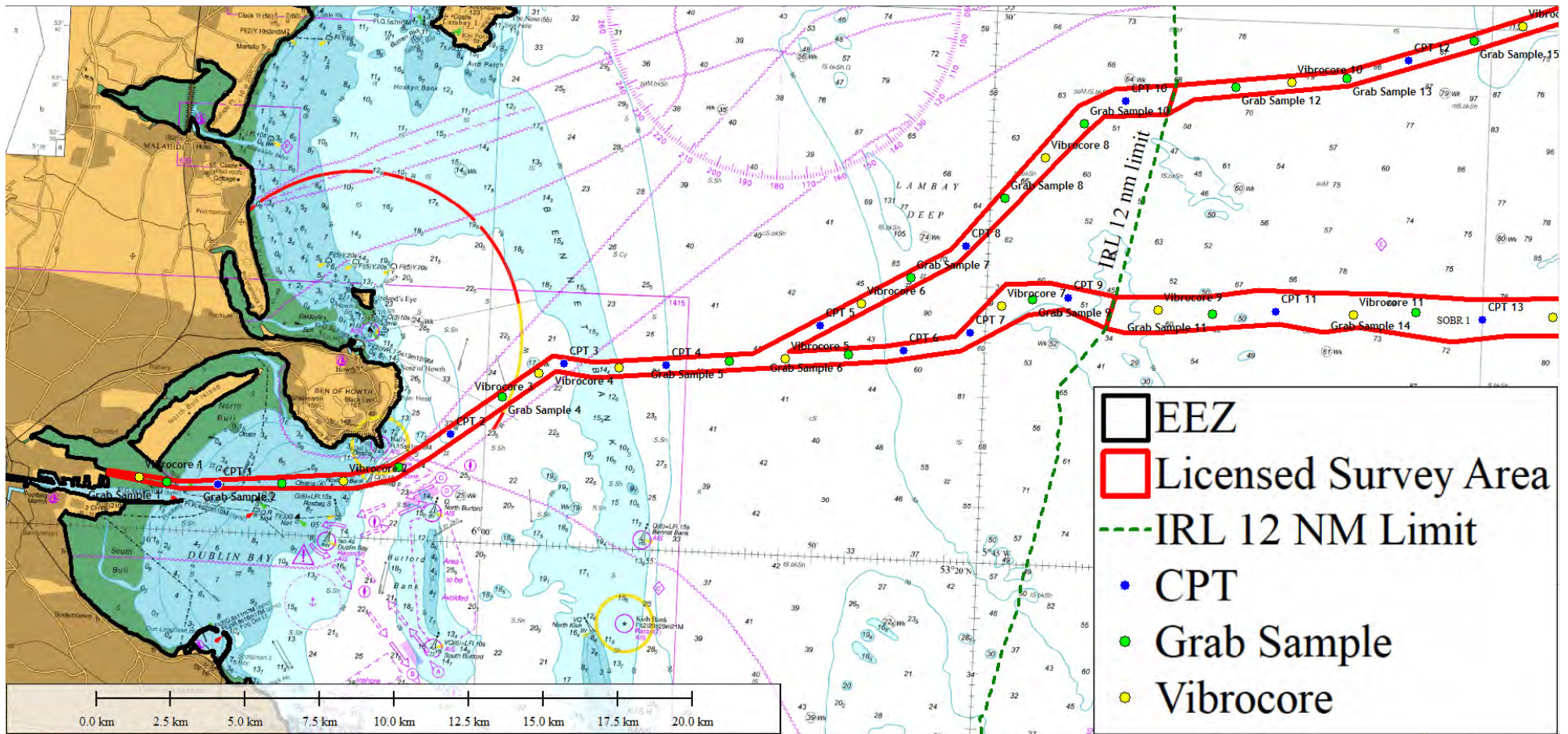


Figure 5. Indicative CPT, GS, and Vibrocore Locations (2/3)

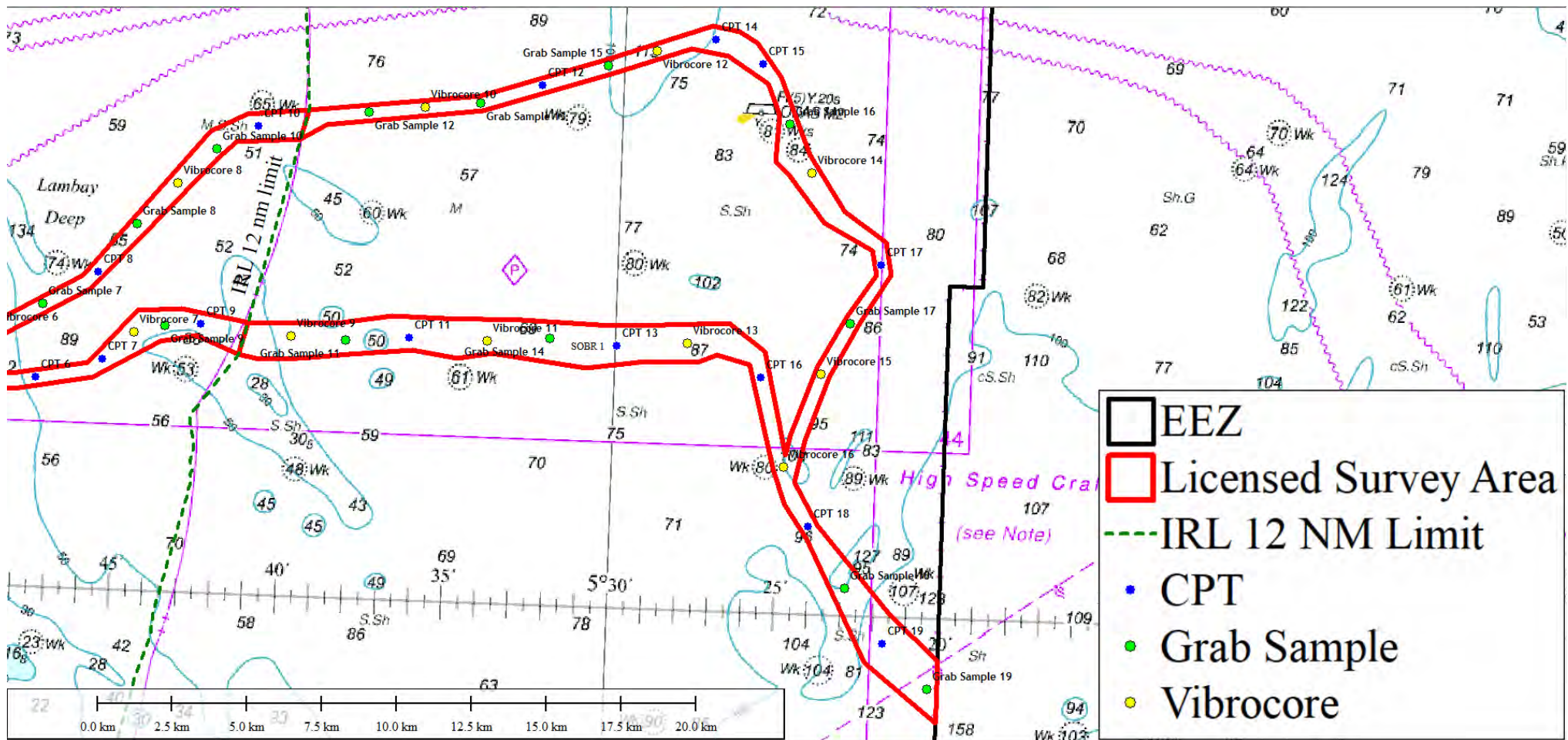


Figure 6. Indicative CPT, GS, and Vibrocore Locations (3/3)

Archaeology Survey

4.6 The survey specification considers archaeological data acquisition to enable professional archaeological interpretation and analysis of data. The survey equipment deployed, and data acquisition and processing shall comply with the requirements of the National Monuments Service, Underwater Archaeology Unit. Walk over surveys will be conducted within the intertidal area to check for marine archaeology features and evidence of features of cultural heritage significance.

Survey Vessel Requirements

4.7 Offshore survey vessels are typically between 15m and 75m in length with potential for smaller vessels to be used in nearshore / shallow water areas. Offshore survey vessel typically has an endurance of approximately 14 to 28 days. A vessel with a shallow water draft will be utilised for the inshore survey area. An unmanned surface vehicle (USV) and/or autonomous surface vehicle (ASV) may also be used for the geophysical survey. The survey vessels may use a local port for personnel / equipment mobilisation, bunkering and provisioning.

4.8 All survey vessels will be fit for purpose, will possess all relevant classification certificates and capable of safely undertaking the survey work required. The primary survey vessel will use dynamic positioning for accurate navigation and station keeping. A deck mounted crane or A-frame will be utilised for equipment deployment and recovery. Health, safety, environment, and welfare considerations will be a priority and will be actively managed during the survey scopes of work. Appointed contractors will be required to comply with all legislation relevant to the activities within their scope of work.

4.9 The vessels will conform to the following minimum requirements as appropriate:

- Compliance with Safety of Life at Sea (SOLAS), International Maritime Organization (IMO) and national requirements for operating within Irish territorial waters.
- Station-keeping and sea keeping capabilities required to carry out the survey operations safely.
- Calibrated equipment and spares with necessary tools for all specified works.

- Endurance (e.g., fuel, water, stores) to undertake the required survey works.
- Sufficient qualified staff to allow the survey operations to be carried out efficiently, (typically 24 hours continuous for offshore survey, 12 hours for nearshore survey); and
- Appropriate accommodation and crew welfare facilities.

4.10 Survey vessels will follow appropriate Biosecurity protocols and regulations such as the International Maritime Organisation (IMO) Guidelines for the control and management of ships' ballast water, to minimise the transfer of harmful aquatic organisms and pathogens.

Survey Duration

4.11 The intention is to commence the survey as soon as feasible following Maritime Usage Licence award, considering survey vessel availability, the overall transatlantic cable route survey programme, seasonality, and suitable weather windows. The exact mobilisation dates will not be known until the process of procuring a contractor and issue of the Maritime Usage Licence is complete but is planned for mid-April 2024. It is anticipated that the marine geophysical survey and site investigations activities within the marine licence application area will take less than 6 weeks in total and will be completed over a 6-month period.

4.12 The estimated time required to complete the cable route survey campaign activities is described in Table 3 below.

Activity	Typical Time Period Required for Activity	Total Number of Site Investigation Locations	Total Time for Survey Activity
Inshore Geophysical Survey	3 to 4 days (weather and sea state dependent)	400 - 700 m cable route corridor (500m nominal)	3 to 4 days (weather and sea state dependent)
Offshore Geophysical Survey	14 to 18 days (weather and sea state dependent)	500 - 1500 m cable route corridor (500m nominal)	14 to 18 days (weather and sea state dependent)
CPT	30 minutes - 2 hours in any one location	37	74 hours within total 9 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)
Vibro Corer	30 minutes - 2 hours in any one location	33	66 hours within total 9 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)
Grab Samples	20 minutes - 45 minutes in any one location	19	12 hours within total 9 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)

Table 3. Estimated Time and Duration of Survey Activities.

5.0 SCREENING FOR MANDATORY EIA

General

5.1 The EIA Directive 2011/92/EU on the assessment of the effect of certain public and private projects on the environment, as amended by EIA Directive 2014/52/EU, sets out the process by which the likely significant effects of a project on the environment are assessed. The Planning and Development Regulations 2001 (as amended) transpose the requirements of the 2014 EIA Directive into planning consent procedures.

5.2 As stated in the regulations an environmental impact assessment (EIA) shall be carried out where either the development would be of a class specified in Part 1 of Schedule 5 of the regulations (as amended) or Part 2 of Schedule 5 of the same regulations.

- Part 1 of Schedule 5 identifies projects of a class that will always have the potential for significant environmental effects and therefore will always require an EIA.

- Part 2 of Schedule 5 identifies projects that may have an environmental impact and, therefore, thresholds or criteria have been set by member states for the requirements of EIA.

5.3 It is a matter for the MARA as the competent authority, to determine whether a formal EIA Screening determination is required having regard to the provisions of the EIA Directive and Schedule 5 of the Planning Regulations. The information in this report is provided to inform the determination on a requirement for EIA screening, and if required, to inform the screening assessment and determination.

5.4 This report does not comprise an Environmental Impact Assessment Screening Report or an Environmental Impact Assessment (EIA) Report, nor does it form part of an Environmental Impact Assessment under the provisions of the EIA Directive 2011/92/EU, as amended by EIA Directive 2014/52/EU.

Screening for Mandatory EIA

5.5 EIA is required in one of three circumstances:

a) Project Type – Is the proposed development “a project” as understood by Article 1(2)(a) of Amended 2011/92/EU Directive? Is the proposed development of a class specified in Part 1 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended) and exceeds any specified relevant quantity area or other limit specified?

Or

b) Mandatory Thresholds – Is the proposed development of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended)? Does the Project exceed the applicable thresholds as listed in the Schedule 5 of the Planning & Development Regulations 2001 (as amended)?

Or

c) Sub-threshold Development – Is the proposed development of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 (as amended), does not exceed the relevant quantity, area, or other limit, but is in a sensitive location and / or of a type that could lead to significant effects on the environment.

Project Type

Article 1(2)(a) of the Amended 2011/92/EU Directive provides the following definition for a project: “the execution of construction works or of other installations or schemes” “other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources”.

- 5.6 The cable route survey and site investigation works comprise temporary and short-term investigations including the undertaking of non-intrusive geophysical survey, localised marine site investigations and seabed sampling such as CPT and Vibrocores as detailed by Section 4 above. The cable route survey and site investigation works do not comprise a project for the purposes of EIA.
- 5.7 A review of the project types in Part 1 of Schedule 5 as described above have been considered in the preparation of this report. The cable route survey and site investigation works are not a project type or class listed in Part 1 of Schedule 5 of the Regulations.

Mandatory Thresholds

A review of the project types in Part 2 of Schedule 5 have been considered in the preparation of this report. The cable route survey and site investigation works are not a project type or class listed in Part 2 of Schedule 5 of the Regulations. For clarity, it is considered that the site investigations (shallow vibrocores, gravity cores and seabed CPT's) that are part of the cable route survey do not constitute a project type under Class 2 Extractive Industry (e) as it does not involve ‘deep drilling’ and falls within the exception for drilling for investigating the stability of the soil.

Sub Threshold Development

It is the view of the applicant that the cable route survey and site investigations do not comprise a project for the purposes of EIA and do not come within any class of development to which the EIA Directives apply, or which requires mandatory EIA as defined in Schedule 5 (Part 1 & Part 2). The survey operations (geophysical and site investigations) are both temporary and short term in nature and not of a type that could lead to significant impact on the environment.

6.0 SCREENING OF SIGNIFICANCE OF EFFECTS ON THE ENVIRONMENT

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
Brief Project Description: Marine Survey and Site Investigations for cable route and landfall options for a fibre optic cable system landing in Dublin Bay, Co Dublin.		
1. Will construction, operation, decommissioning, or demolition works of the Project involve actions that will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?	Yes. The collection of grab samples & vibrocores of the seabed sediments will cause temporary and localized disturbance of the seabed and limited suspended sediments. There will be no topographic or land use changes.	The seabed is regularly disturbed by natural processes. The cumulative volume of sediment collected in the grab samples and shallow cores is small. Any sediment disturbed or suspended by the sampling will settle almost immediately. Overall, the work relates to marine geophysical surveys, site investigations and landfall surveys. The survey is transient, of short duration, with reinstatement of any areas of seabed impacted by sampling of the seabed completed naturally by tidal movements and currents. No likely significant impact.
2. Will construction or the operation of the Project use natural resources such as land, water, materials, or energy, especially any resources which are non-renewable or are in short supply?	Yes. The marine survey and site investigations operations will be carried out by vessels or equipment that will use fuels such as diesel.	No likely significant impact.
3. Will the Project involve the use, storage, transport, handling or production of substances or materials which could be harmful to human health, to the environment or raise concerns about actual or perceived risks to human health?	Yes. The marine survey and site investigations operations will be carried out by vessels or equipment that will use fuels such as diesel and oil-based lubricants which have potential to be harmful to the environment in the event of an accidental fuel spill.	Normal vessel operating standards and precautions and mandatory maritime regulations such as the MARPOL Convention on Marine Pollution will ensure that the risk of an accidental release of harmful materials such as fuels will be low. No likely significant impact.
4. Will the Project produce solid wastes during construction or operation or decommissioning?	Yes. A very small amount of non-hazardous refuse will be produced on board from the normal day to day operations of the survey vessels such as kitchen waste, consumables etc.	No waste material will be dumped into the sea. All refuse waste shall be stored on board the vessel and safely disposed of onshore in accordance with the MARPOL Convention. No likely significant impact.

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
<p>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)?</p>	<p style="text-align: center;">No.</p>	<p>The surveys will be undertaken by vessels which comply with EU requirements in terms of operational controls and environmental standards. Air quality standards will not be exceeded.</p> <p>No likely significant impact.</p>
<p>6. Will the Project cause noise and vibration or the releasing of light, heat energy or electromagnetic radiation?</p>	<p style="text-align: center;">Yes.</p> <p>The Marine Survey uses acoustic / sonar techniques which emit underwater noise. Survey vessels also generate noise from engines, props etc.</p>	<p>The potential impacts from the survey are described in the Supporting Information for Screening of Appropriate Assessment and Natura Impact Statement accompanying the application. The best practice guidelines “Guidance to manage the risk to marine mammals from man-made sounds in Irish waters, NPWS 2014” is the standard practice to mitigate the risk to marine mammals from marine surveys and will be implemented for the duration of the survey operations including pre-start monitoring, soft start and ramp up procedures. A qualified and experienced marine mammal observer (MMO) will be employed during the surveys to monitor marine mammals and log all sightings and events.</p> <p>No likely significant impact.</p>
<p>7. 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 style="text-align: center;">Yes.</p> <p>Vessels or equipment will use fuels such as diesel and oil-based lubricants which have potential to be harmful to the environment in the event of an accidental fuel spill.</p>	<p>To minimise risk, all machinery will only be fuelled on the hard stand area of a car park or road, at least 10m from a drain or gully.</p> <p>Normal vessel operating standards and precautions and mandatory maritime regulations such as the MARPOL Convention on Marine Pollution will ensure that the risk of an accidental release of harmful materials such as fuels will be low. Spill kits will be available on site for the duration of works.</p> <p>No likely significant impact.</p>
<p>8. Will there be any risk of accidents during construction or operation of the Project that could affect human health or the environment?</p>	<p style="text-align: center;">Yes.</p> <p>Marine survey vessels operate at low vessel speeds when carrying out survey operations and will be stationary at times when deploying and recovering equipment. This may pose an increased risk of vessel-to-vessel collision.</p>	<p>A notice to mariners will be published in advance of survey operations to inform the public and other marine users in the locality. The survey vessels will display the appropriate lights, shapes and have active AIS. Compliance with the requirements of the International Regulations for Preventing Collisions at Sea will be always followed and it is expected that there will be no impact on shipping movements in the area. Survey vessels will follow appropriate</p>

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
		Biosecurity protocols and regulations such as the International Maritime Organisation (IMO) Guidelines for the control and management of ships’ ballast water, to minimise the transfer of harmful aquatic organisms and pathogens. No likely significant impact.
9. Will the Project result in environmentally related social changes, for example, in demography, traditional lifestyles, employment?	No.	The survey operations are of short durations and will not result in any direct social changes such as demography, traditional lifestyles, or employment. No likely significant impact.
10. Are there any other factors that should be considered such as consequential development which could lead to environmental impacts or the potential for cumulative impacts with other existing or planned activities in the locality?	Yes. The applicant is aware of proposals for renewable energy developments sites and associated marine survey across the East Coast. Cumulative impact of these developments is considered in this application. In due course, an application for the installation of the cable system will be made.	The NIS and supporting information did not identify any significant environmental cumulative impacts arising from the planned survey operations. To minimise risk of cumulative impacts on fisheries, shipping, and general navigation, notice to mariners, local fisheries liaison and other mitigation measures will be considered. No likely significant impact.
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, which could be affected by the Project?	Yes. In terms of European designated sites, the Licence Area intersects with South Dublin Bay and River Tolka Estuary SPA (SITECODE = 004024), North Dublin Bay SAC (SITECODE = 000206), North Bull Island SPA (SITECODE = 004006), North-West Irish Sea SPA (SITECODE = 004236), Rockabill to Dalkey Island SAC (SITECODE = 003000), There are 5 shipwrecks in or within 100m of the Licence Area.	The applicant NIS concluded that, with the implementation of specified mitigations measures, the development alone or in combination with other activities, would not cause any adverse effect on the integrity of any European sites. The geophysical survey data will be analysed to identify any known or previously unrecorded wrecks or potential cultural heritage features which will be avoided by any intrusive survey activities such as sampling or CPT’s. With the implementation of specified mitigations measures, no likely significant effects on cultural heritage or archaeology are foreseen. Dublin Bay is considered part of the city’s green infrastructure in the Dublin City Development Plan 2022 to 2028. The surveys are temporary in nature and will not present a negative impact on the landscape. No likely significant impact.

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
12. Are there any other areas on or around the location that are important or sensitive for reasons of their ecology e.g., wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests, or woodlands, that could be affected by the Project?	No	With the implementation of specified mitigations measures, the marine survey and site investigations are not likely to cause any significant adverse impact.
13. Are there any areas on or around the location that 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?	No	Due to the localised and temporary nature of the marine survey and site investigations and with the implementation of specified mitigations measures in relation noise and general disturbance, the surveys are not likely to cause any significant adverse effects on any sensitive species of fauna or flora. No likely significant impact.
14. 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?	No	Due to the localised and temporary nature of the marine survey and site investigations and with the implementation of specified mitigations measures, the marine survey and site investigations are not likely to cause any significant adverse effects on the coastal zone and related water bodies. No likely significant impact
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the Project?	No	The surveys are temporary in nature and will not present a negative impact on the landscape or scenic qualities of the area. No likely significant impact.
16. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the Project?	Yes	No public facilities will be impacted by the works. Public access will be always maintained. No likely significant impact.
17. Are there any transport routes on or around the location that are susceptible to congestion, or which cause environmental problems, which could be affected by the Project?	No	The survey corridor avoids major fishing, shipping, and navigation routes. Most of the vessel traffic traversing the offshore marine survey corridor is made up of recreational vessels. No congestion of vessel movements is expected because of the marine survey operations and any disruption will be temporary and of short duration.

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
		No likely significant impact.
18. Is the Project in a location in which it is likely to be highly visible to many people?	Yes	The survey corridor is in Dublin Bay, and thus is visible to people along the coast. However, the surveys are temporary in nature and given the existing marine vessel traffic in the general area, the survey will not present a negative visual impact. No likely significant impact.
19. Are there any areas or features of historic or cultural importance on or around the location that could be affected by the Project?	There are 5 shipwrecks in or within 100m of the Licence Area.	The geophysical survey data will be analysed to identify any known or previously unrecorded wrecks or potential cultural heritage features which will be avoided by any intrusive survey activities such as sampling or CPT's. A Marine Archaeology Assessment has been prepared which considers the works in combination with historical and cultural sensitivity of the area. With the implementation of specified mitigations measures, no likely significant effects on cultural heritage or archaeology are foreseen. No likely significant impact.
20. Is the Project located in a previously undeveloped area where there will be loss of greenfield land?	No	The survey is temporary in nature. No likely significant impact.
21. Are there existing land uses within 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 that could be affected by the Project?	Yes	Public access will be always maintained. Any impact on vessel movements within the survey corridor such as by local fishers or recreational sailing vessels because of the marine survey operations will be temporary and of short duration. No likely significant impact.
22. Are there any plans for future land uses within or around the location that could be affected by the Project?	No	There is no indication of any plans for future land uses that could be affected by the project. No likely significant impact.

Questions to be Considered	Yes / No /? Briefly describe	Is this likely to result in a significant impact? Yes/No/? – Why?
23. Are there areas within or around the location which are densely populated or built-up, that could be affected by the Project?	No	As the landfall is in Dublin Port, it is in an industrial area, and it will not be affected by the project. No likely significant impact.
24. Are there any areas within or around the location which are occupied by sensitive land uses e.g., hospitals, schools, places of worship, community facilities, that could be affected by the Project?	No	Public access will be always maintained. No likely significant impact.
25. Are there any areas within or around the location which contain important, high quality or scarce resources e.g., groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, that could be affected by the Project?	No	No likely significant impact.
26. Are there any areas within or around the location which are already subject to pollution or environmental damage e.g., where existing legal environmental standards are exceeded, that could be affected by the Project?	No	No likely significant impact.
27. Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g., temperature inversions, fogs, severe winds, which could cause the Project to present environmental problems?	Yes, Coastal fog or adverse stormy weather and related sea states can occur in the Licence Area and wider coastal / offshore marine zones.	The survey vessels and equipment will be operated in accordance with the weather limitations and will be fit for purpose. No likely significant impact.

7.0 ENVIRONMENTAL APPRAISAL

Archaeology and Cultural Heritage

- 7.1 An Underwater Archaeological Impact Assessment (UAIA) has been prepared by Mizen Archaeology on behalf of the applicant to assess the potential impacts of the survey on archaeology and cultural heritage. The UAIA covers the Licence Area within Irish territorial waters and the landfall in Dublin Bay.
- 7.2 Due to the nature of the landfall location on reclaimed land, the likelihood of encountering terrestrial archaeological remains is greatly reduced.
- 7.3 The Licence Area does not contain any recorded sites or monuments within the foreshore. However, within a 1km radius of the landfall there are several sites from the 18th Century.
- 7.4 Within the marine area (subtidal inshore and offshore) along this stretch of coast are a high number of recorded shipwrecks. 5 wrecks are of interest to this study, and of those with a known date are from the late-19th century onwards; they are thus afforded statutory protection under the National Monuments Acts 1987-2014. There are four recorded wrecking events within the Licence Area.
- 7.5 Figure 5 shows the distribution of the wrecks as recorded in the Wreck Inventory of Ireland Database, with both known and unknown identities. There are five recorded wrecking events within the Licence Area or within 100m of the Licence Area (W01465, W01466, W02214, W09785, and W10291).
- 7.6 One of these is from the 1790s, one from 1991, and the other three are of unknown date. With an additional three recorded wrecks immediate but outside the Licence Area, there is a high potential for preservation of wrecks, wreck material or artefacts associated with wrecking events within and adjacent to the Licence Area. Further details of these wrecks are included in the Underwater Archaeological Impact Assessment.
- 7.7 No invasive SI works are proposed over the wrecks within the survey corridor (W02214, W09785, and W10291). Wreck W02214 is located c. 891m south of a grab

sample (48) and c. 896m north of a Vibrocore sample (31). Wreck W09785 is located c. 852m east of a cone penetration test (CPT 1) and c. 1.3km east of a grab sample (37). Wreck W10291 is located c. 226m southwest of a grab sample (45) and c. 1.7km east of a Vibrocore sample (24). The wrecks within a c. 100m buffer of the proposed corridor are all over 350m away from proposed invasive samples.

- 7.8 The archaeological data for recorded wreck sites and the evidence of how dangerous Dublin Bay has been through recorded history suggests there is a high potential for archaeological remains for the general area of the proposed cable installation and the associated survey corridor. The landfall on the reclaimed which makes up Dublin Port itself has less potential, though it sits above historic estuarine sediments and pools and may conceal further archaeological evidence. Excavations and monitoring works on the reclaimed land has yet to reveal archaeological remains, however. Works from the low tide out to sea elsewhere, however, has revealed new shipwrecks and other archaeological material.
- 7.9 The non-invasive geophysical survey shall have a positive impact on the underwater cultural heritage of Dublin Bay and the Irish Sea as it shall provide further information on potential cultural heritage sites.
- 7.10 As three known historic shipwreck sites are located within the cable route corridor the geophysical survey should be carried out under licence from the National Monuments Service. The geophysical survey data sets shall be assessed by an underwater archaeologist with experience in interpreting geophysical surveys in advance of the geotechnical works taking place. The assessment of the geophysical data may lead to further mitigation measures if potential archaeological features are noted in the geophysical data.
- 7.11 A site inspection, accompanied by a metal detection survey where possible, shall be undertaken on the inter-tidal and upper foreshore within the cable route corridor. The survey shall be carried out by underwater archaeologists under licence from the National Monuments Service.
- 7.12 No geotechnical works shall be undertaken in advance of agreement with the National Monuments Service regarding the assessment of the geophysical data and site inspection.
- 7.13 Following the completion of the geotechnical works the data logs relating to the core and grab samples shall be assessed by an underwater archaeologist.

At the completion of the geophysical and geotechnical works the AIA report shall be updated to consider potential impacts associated with the main installation works. The report shall assess the results of the geophysical and geotechnical works shall include proposals for mitigation of potential impacts on archaeology, such as avoidance, dive surveys, monitoring, or test excavations.

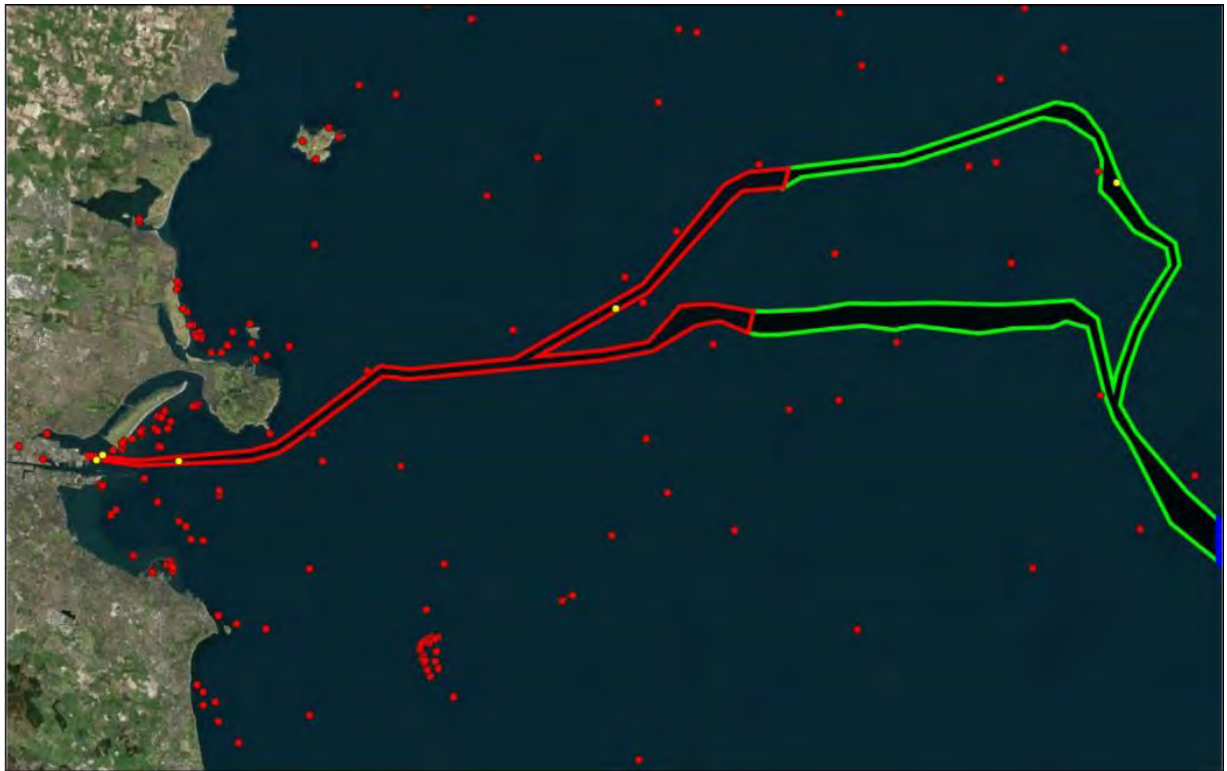


Figure 7. Known wreck locations in or within 100m of the licence area (yellow).

People and Human Health

7.14 The geographic extents of the survey area are predominantly offshore with limited survey and site investigations planned at the landfall. The landfall is in Dublin Port, which is in Dublin City, as shown in Figure 8. The survey corridor is also close to the towns of Howth and Dun Laoghaire. The landfall is in an industrial area in Dublin Port, and is located away from people, houses, and industrial activities.

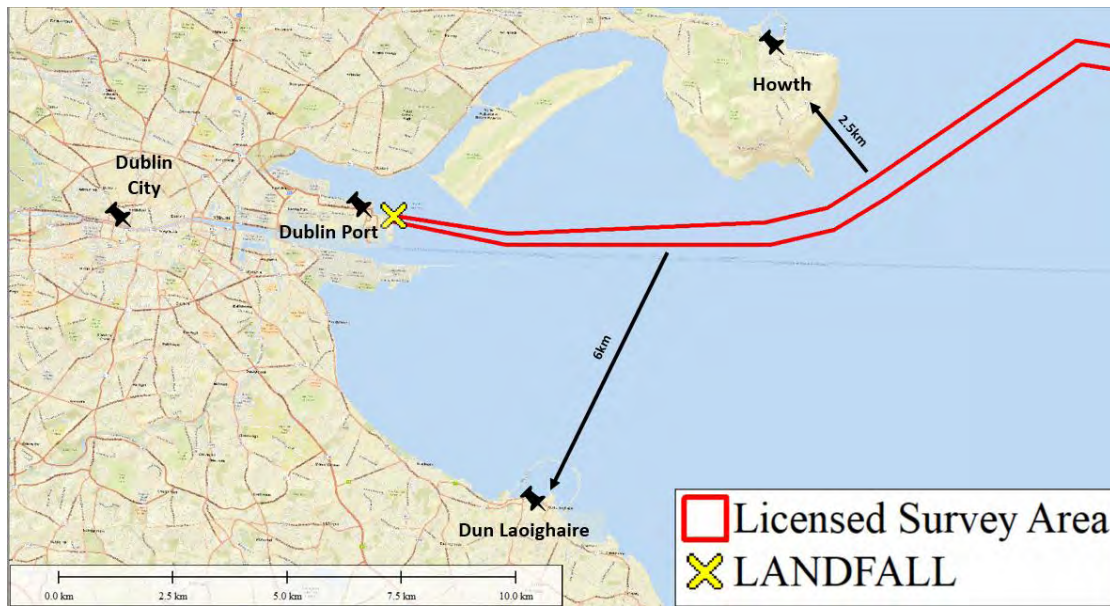


Figure 8. Settlements close to survey area.

7.15 All surveys and site investigations will be conducted in accordance with all relevant national and international Health and Safety Legislation and Regulations, such as the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005) and Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007), as amended and in adherence to all major international shipping conventions, adopted by the International Maritime Organization (and the International Labour Organization) concerning maritime safety and pollution prevention. With the implementation of these, there will be no impact nor any significant effects on people and human health during the survey activities.

Biodiversity, Flora, and Fauna

7.16 Site visits were carried out at low water on 9th August and 2nd September 2023 by Bryan Deegan MCIEEM. The terrestrial landfall area was walked and photographed (Plates 1 – 4). It was noted that the estuarine element of the river Tolka borders and runs along the reclaimed land and boulder, at low water. As a result, there is no direct intertidal area beyond the extent of the boulders on the shore. No significant works are proposed in the vicinity of the landfall and works consist of non-intrusive topographic survey along the line of the proposed cable route at the landfall.

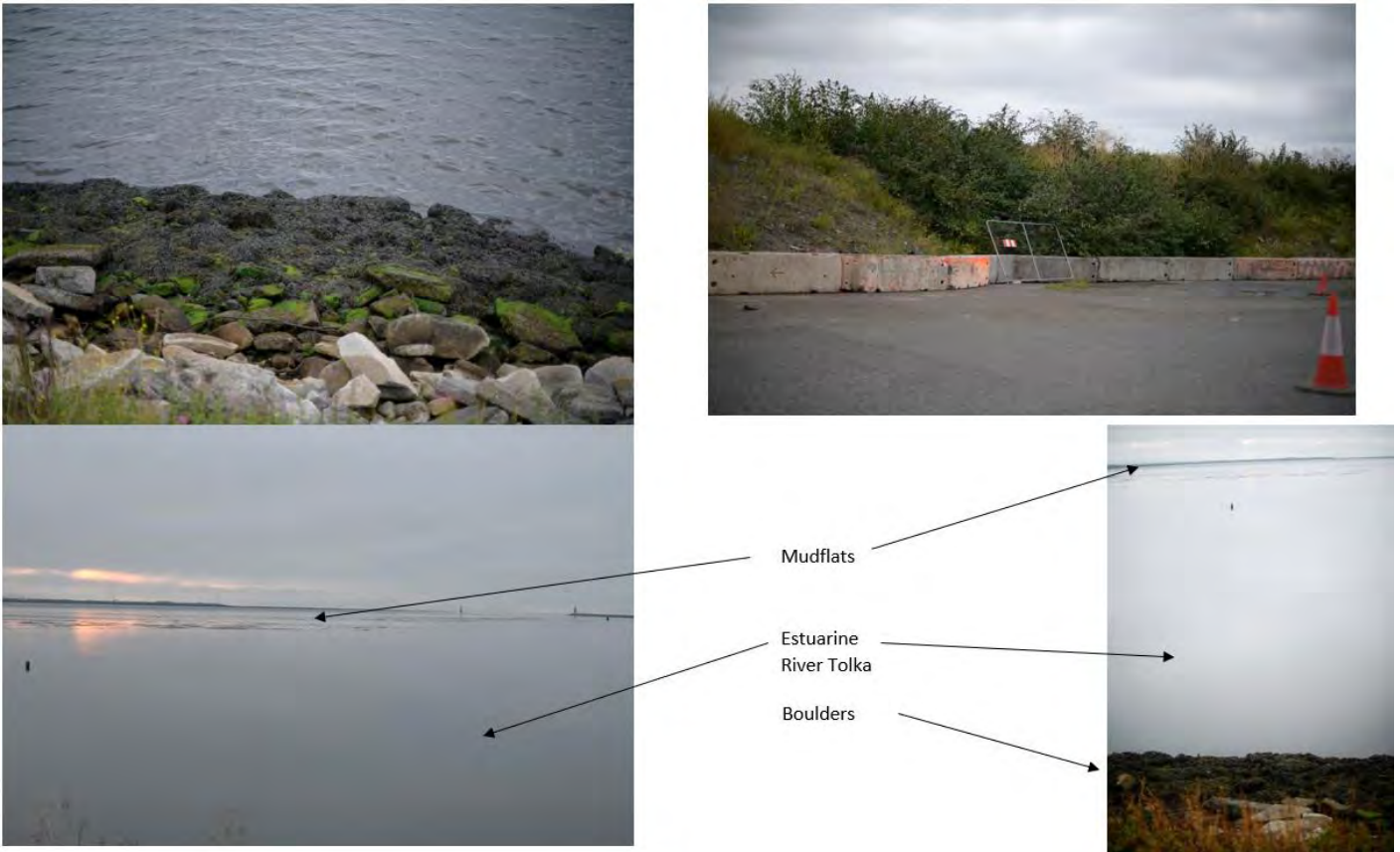


Figure 9. Plates 1-4. Landfall. (Clockwise from top left) Infill boulders (TL), Infill berm (TR), Mudflats (BL), River Tolka (BR)

Species: Birds

7.17 No protected bird species were noted in the vicinity of or seen utilising the landfall area. The proposed terrestrial and intertidal survey works are not located within a SPA. The terrestrial and intertidal element of the survey works will be within Dublin Port. These terrestrial habitats in this area are highly disturbed and the intertidal habitat is proximate to a busy port and the dredged port channel. No birds were roosting on the shores during the site visit.

Species: Amphibians

7.18 The common frog (*Rana temporaria*) was not observed in the surrounding terrestrial areas. NPWS records of rare and threatened species in addition to the NBDC sightings records were investigated and showed no records in proximity of the landfall or beach area. No drainage ditches were observed in the terrestrial element of the proposed survey works. No amphibians of conservation importance are recorded on NPWS data.

Species: Mammals

- 7.19 No badger setts, otter holts or evidence of terrestrial mammals of conservation importance were seen in the vicinity of the landfall areas. Records of sightings of otter and hedgehog were noted in the vicinity of the landfall area based on the NBDC records. Grey Seal (*Halichoerus grypus*) and Common Seal (*Phoca vitulina*) have also been noted in the vicinity of the landfall area and along the cable route.

Flora

- 7.20 A 4m high berm of soil and reclaimed building material was in the vicinity of the landfall area. The habitat in the landfall area, based on the Fossitt (2000) classification were built land, recolonising bare ground and sheltered rocky shores. No protected or invasive species were noted on site.

Cetacean Species

- 7.21 Figures 10 and 11 show all cetacean species sightings in the vicinity of the proposed survey works, as recorded by IWDG sightings scheme. Cetacean activity has been seen in the vicinity of the proposed survey works. Species seen in the area include primarily harbour porpoise (*Phocoena phocoena*). Figure 12 shows a map of grey seal conservation sites around Ireland.

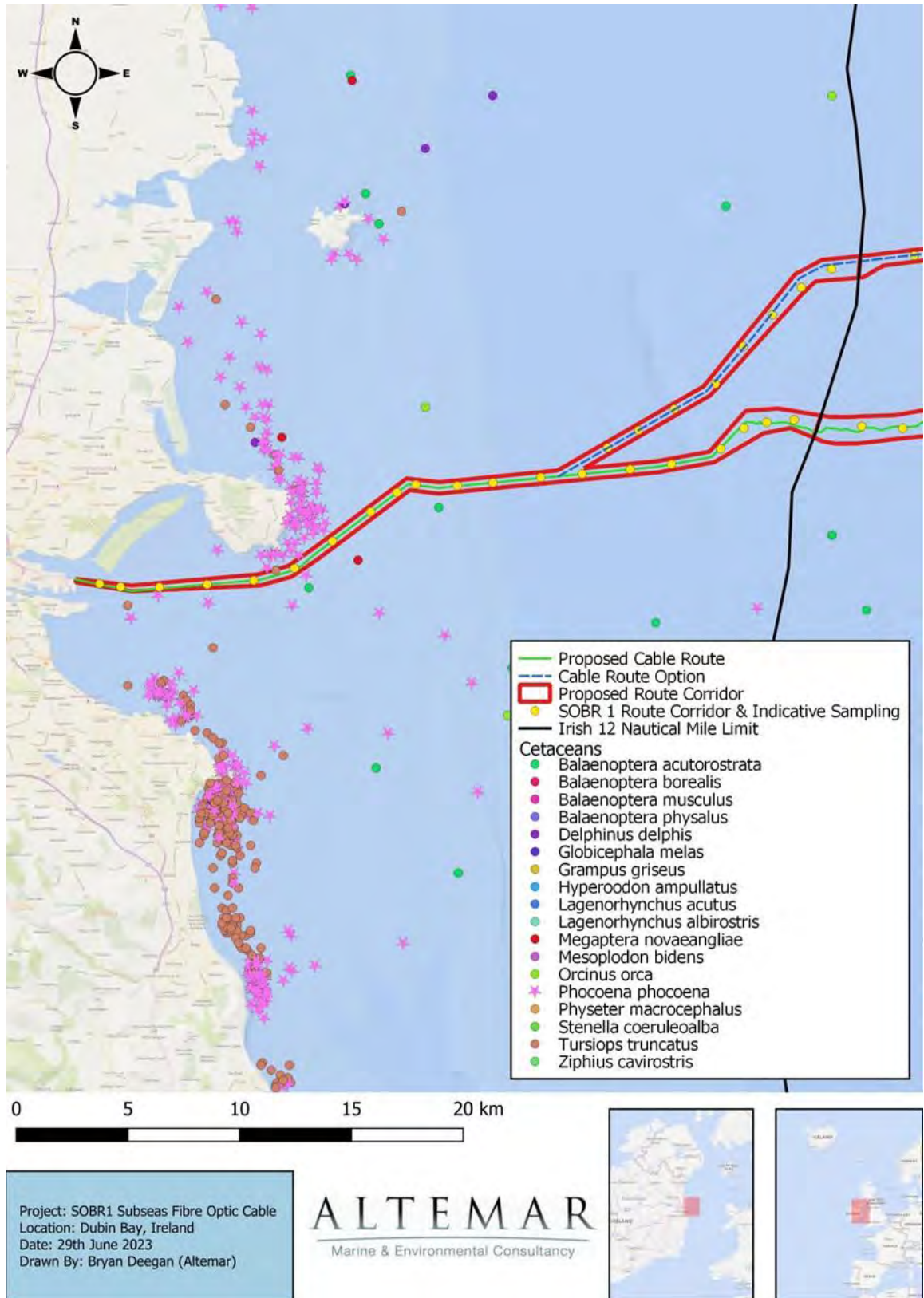


Figure 10. Cetacean Sightings (IWDG).

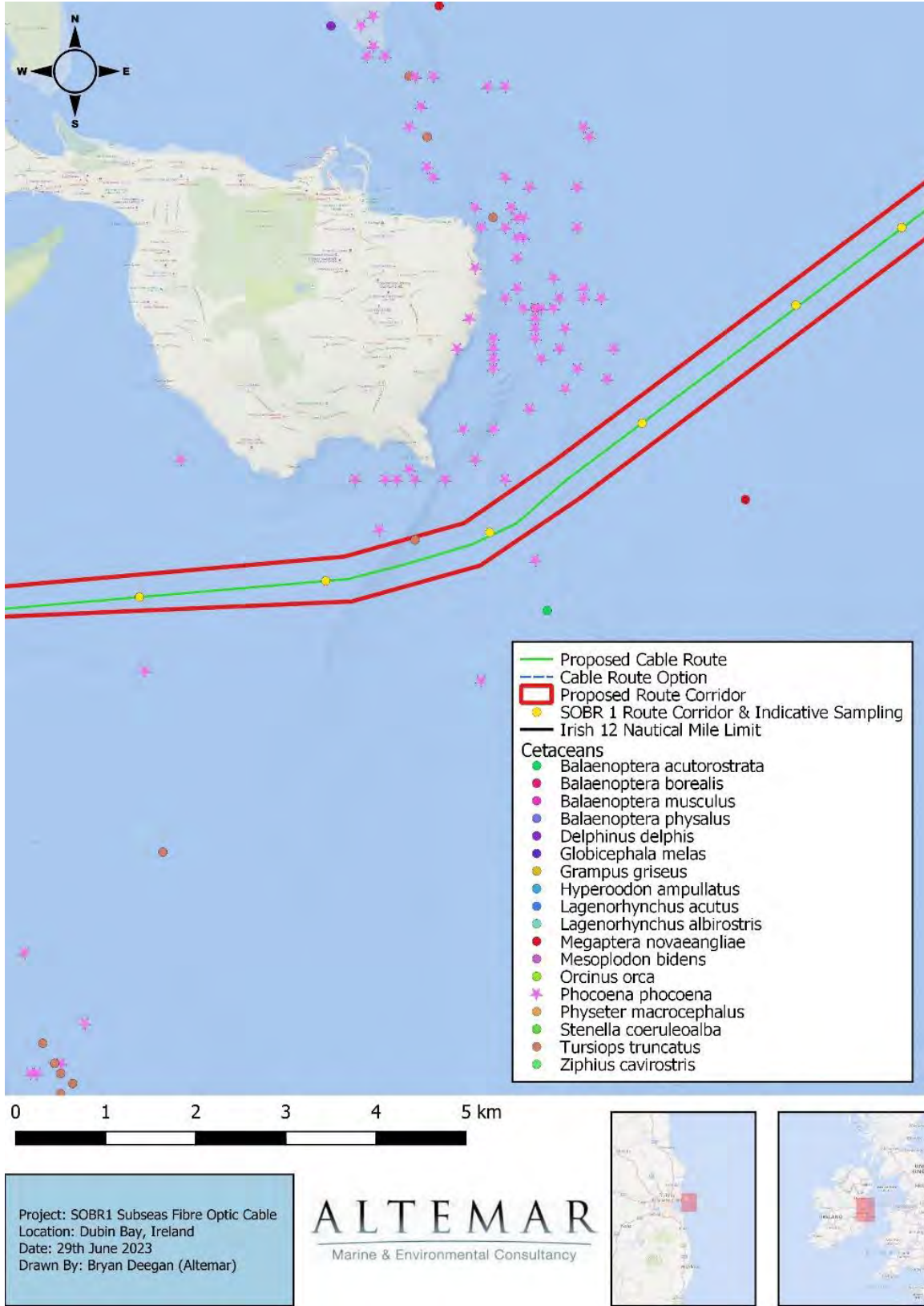
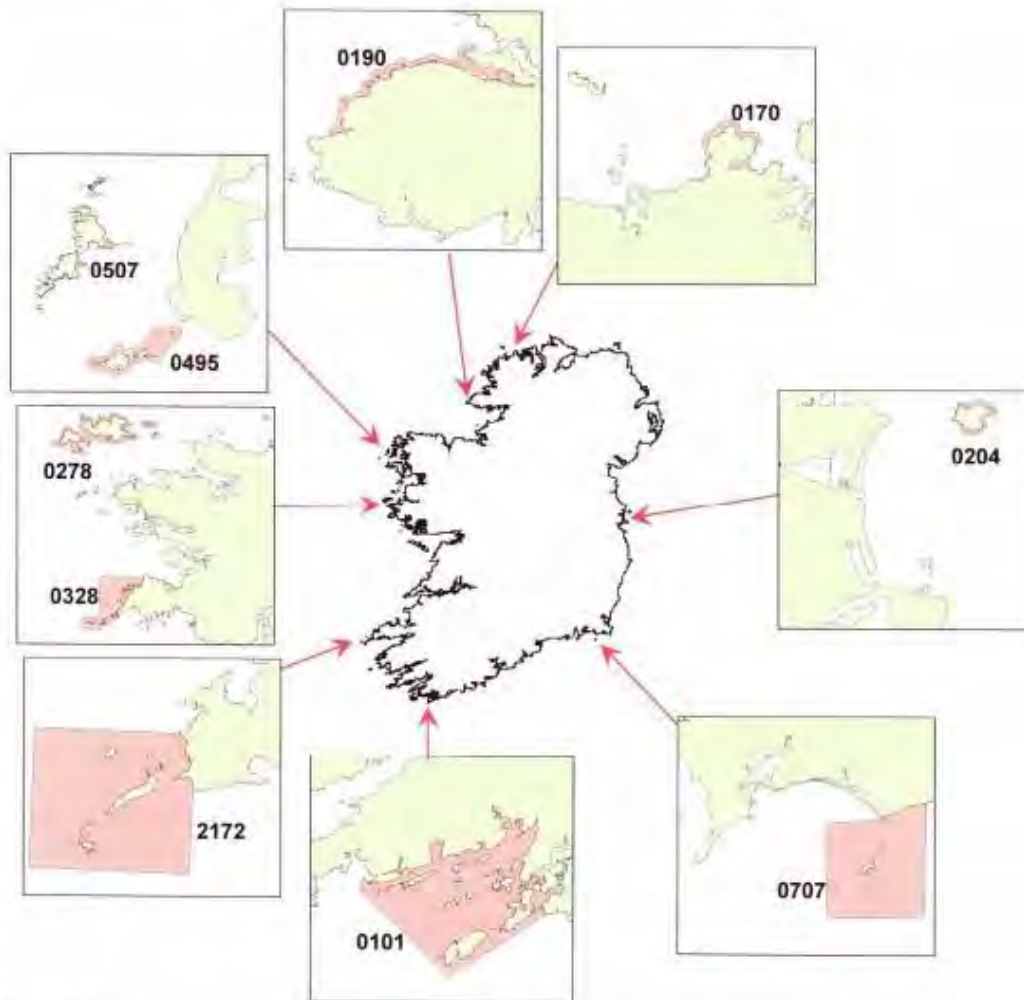


Figure 11. Cetacean Sightings (IWDG).

Grey seal population monitoring, 2009 - 2012



Legend:

Site code	Conservation Site Name	County
000147	Horn Head and Rinclevan SAC	Donegal
000190	Slieve Tooley/ Tormore Island/ Loughros Beg Bay SAC	Donegal
000495	Duvillaun Islands SAC	Mayo
000507	Inishkea Islands SAC	Mayo
000278	Inishbofin and Inishshark SAC	Galway
000328	Slyne Head Islands SAC	Galway
002172	Blasket Islands SAC	Kerry
000101	Roaringwater Bay and Islands SAC	Cork
000707	Saltee Islands SAC	Wexford
000204	Lambay Island SAC	Dublin

Figure 12. Grey seal conservation sites.

Historic Records of Biodiversity

7.22 The National Biodiversity Data Centre's online viewer was consulted to determine the extent of biodiversity and/or species of interest in the area. Appendix I of the ECiA report provides a list of all species recorded in custom polygons drawn to the outline of the licence area and 10km grid areas that possess a specific designation, such as Invasive Species or Protected Species.

Potential Effects

7.23 The marine and intertidal survey of a fibre-optic cable is a complex and challenging procedure. From the beginning of the planning stage to determining the final cable route, careful thought has gone into ensuring the longevity of the cable and uninterrupted service. This, in tandem with marine usage licencing and environmental legislation results in the routing of the cable in as stable an environment as possible that will have minimal impact on the environment and threat of anthropogenic disturbance. The laying of a cable within the 12nm limit, will involve burial in sediment, surface laying on hard substrate and elements of diver works in the shallow subtidal. The marine survey is to identify the optimal route for the cable. The survey elements will involve intertidal bar probes (by boat/diver) and acoustic/geophysical survey offshore.

7.24 The terrestrial activities will involve the movement of personnel and machinery on existing roads and a topographic survey (handheld) of the landfall area. No excavation is proposed in the terrestrial areas. The principal elements of the terrestrial activities are the facilitation of topographic surveys. Intertidal works involve bar probes during a single tide, where the intertidal area is covered by water. The presence of boats and personnel in the intertidal may temporarily disturb wildlife. However, it is important to note that these works are within a busy port area that is accustomed to human and boat traffic. Minor disturbance of the sediments in the intertidal will occur during the bar probing but this effect would be deemed to be minor and localised. Pollution generated from machinery/construction activities could potentially impact the intertidal and terrestrial habitats. Potential impacts on habitats and species and the extent of these impacts that could potentially be encountered during the construction phase are seen in the EciA.

7.25 In the subtidal the process will involve a ship moving at a speed of approximately 4kn and generating acoustic noise with the use of acoustic equipment. In addition, geotechnical sampling will also generate localised noise but also localised disturbance of sediment. However, as the vessel will be stationary during geotechnical sampling (cores, grabs etc.) this disturbance of silt will be very localised. During the acoustic survey disturbance of cetaceans and seals may occur due to the presence of the vessel and underwater noise.

Land and Soils

7.26 The survey area covers a potential landfall at Dublin Port, on the eastern boundary of the port lands. The landfall location is adjacent to the Alexandra Road Extension and north of the Unified Ferry Terminal area (T5).

7.27 The underlying bedrock strata in this area is defined as the Lucan Formation from the Lower Carboniferous (Mississippian) period (Figure 13). Bedrock consists of 'Calp' (Lucan Formation). The Lucan Formation is comprised deep marine mudstones and siltstones which represent distal turbidites. The main lithologies are dark argillaceous limestones, shales and calcareous mudstones with some skeletal units and common chert and pyrite.

7.28 There are no exposed outcrops of bedrock or designated sites of Geological Heritage located in proximity to the survey area. Dublin port lands on the eastern extents of the port were reclaimed from the sea and Tolka estuary. The North Bull Wall was constructed between 1819 and 1824.

7.29 The seabed substrate along the survey area consists of mainly sand and sandy mud across the intertidal and nearshore zones. Muddy sands and areas of hard or rocky substrata are indicated within the survey corridor off the Little Baily, progressing to predominantly sands and sandy muds to the EEZ limits. (Figure 14)

7.30 The seabed is regularly disturbed by natural processes. The cumulative volume of sediment collected in the grab samples and shallow cores is small. Any sediment disturbed or suspended by the sampling will settle almost immediately. Overall, the work relates to the marine geophysical survey, site investigations and landfall surveys. The survey is transient, of short duration, with reinstatement of any areas of seabed impacted by sampling completed naturally by tidal movements and

currents. There will be no significant impact nor any significant effects on land and soils within the survey area because of the survey activities.



Figure 13. Geology of Landfall

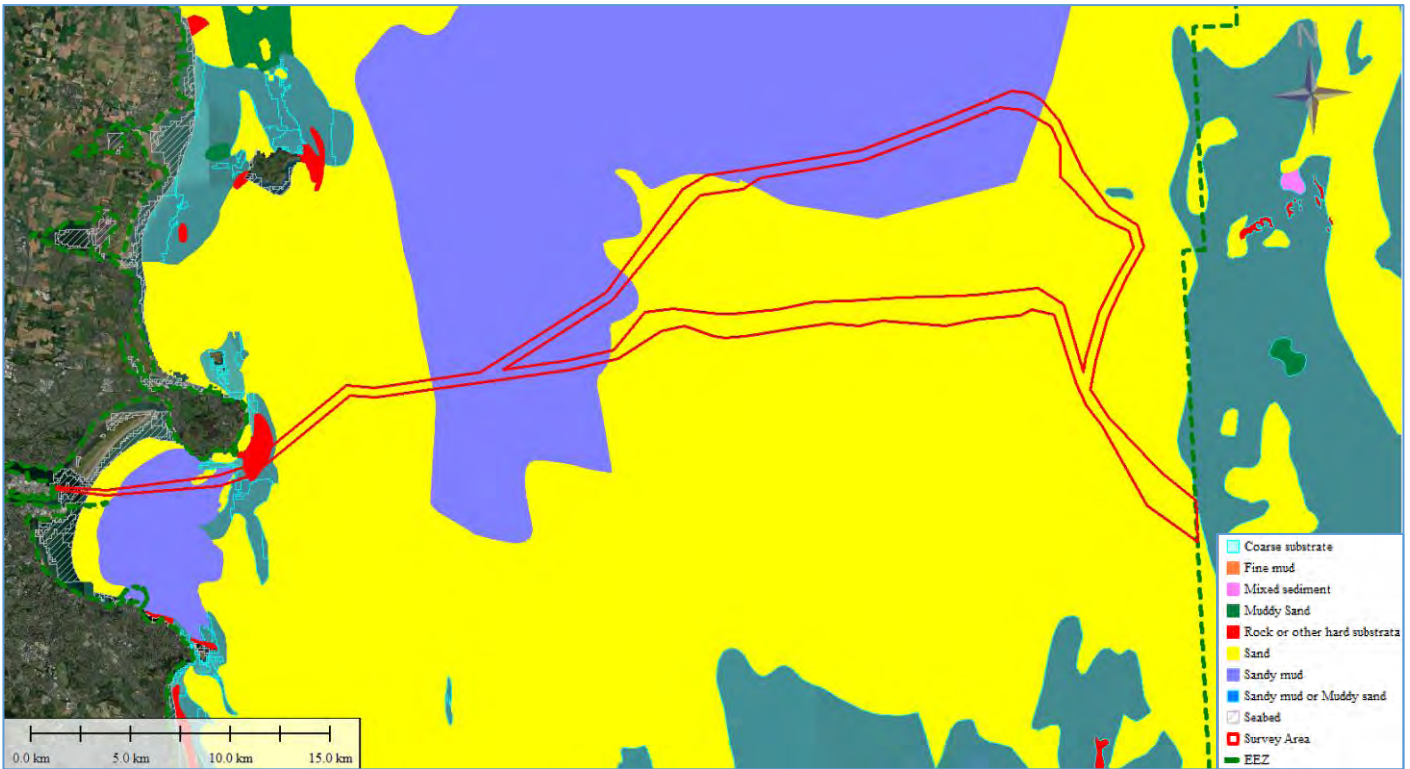


Figure 14. Indicative Seabed Sediments within Survey Area.

Landscape & Seascape

- 7.31 The survey area consists of a landfall survey location at Dublin Port. Most of the survey area comprises a marine corridor in a general East – Northeast direction through Dublin Bay and across the Irish Sea.
- 7.32 The Marine Institute Regional Seascape Character Assessment for Ireland published in 2020 defined the Seascape Character Area in the survey area as Dublin Bay and classified the seascape as a distinctive and active bay framed by two resistant headlands that offer extensive views across the Bay, the Irish Sea and along the coast, north and southwards. The long and extensive coastal settlement and history has created a modified coastline and bay for much of this area.
- 7.33 Given the nature of the survey operations which will be small scale, temporary and conducted over a short timeframe, the visual impact will be limited to the presence of the survey vessels in Dublin Bay. The surveys are temporary in nature and given the existing marine vessel traffic in the general area, the survey will not present a

negative visual impact. There will be no significant impact on the landscape and seascape because of the survey operations.

Hydrology and Water Bodies

- 7.34 Conservation sites and Waterbodies proximate to the Cable Route and Survey Route Corridor within Dublin Bay are demonstrated in the EclA, along with the cable route, survey route corridor, and works (to Irish 12 Nautical Mile Limit and Irish EEZ).
- 7.35 There are no offshore SACs in proximity to any of the survey works. The inshore coastal waterbodies through which the foreshore license area traverses (Dublin Bay) is classed as unpolluted under the Water Framework Directive (WFD) (Figure 15).
- 7.36 Refuelling of equipment, machinery or plant will not take place on the foreshore. All survey vessels will comply with the International Convention for the Prevention of Marine Pollution from Ships (MARPOL) as per best practice which will reduce the risk of contamination incidents or accidents to protect the water quality status of Dublin Bay and the Irish Sea in compliance with the Water Framework Directive.

Air and Climate

- 7.37 The survey area (at the landfall) is designated as Zone A of the EPA Air Quality Zones which comprises all of County Dublin. During the survey, there will be no releases of emissions to air, other than routine vessels exhausts. Air Quality standards will not be exceeded.
- 7.38 The operation of the survey vessels will result in the emission of exhaust gases associated with fossil fuel use. The transport of people, equipment and materials will also result in emissions of exhaust gases. Given the nature of the survey operations which will be conducted over a short timeframe, the quantity of emissions will be small and effects contributing to climate change will not arise. There will be no significant impact on the air and climate because of the survey.



Figure 15. Coastal Waterbody quality around licence area.

Noise and Vibration

- 7.39 Shipping and general vessel traffic is a major contributor to background noise in oceans and seas. Vessels generally produce low frequency continuous sound. The vessels associated with the survey and sampling operations will contribute to background ocean noise. As seen in Figure 16 and 17 below, there is existing vessel traffic (shipping, fishing, recreation) transiting the survey area which generates anthropogenic sound and therefore the operation of the survey vessel in the area will not create significant additional noise or disturbance. Marine mammals are often seen near human activity and exhibit some tolerance to anthropogenic noise and other stimuli and range over a wide area when foraging.
- 7.40 The multi-beam and single beam echosounders, side-scan sonar and sub-bottom profiler are noise emitting technologies. The sound levels and frequencies of the sources are at higher frequency than the frequencies which the most sensitive cetacean are capable of hearing. Acoustic disturbance could occur during the site investigations due to the use of a wide range of frequencies during the geophysical surveys and the localised noise during sampling operations. Noise generated from vibro-coring will be of low intensity, very localized, will move around the survey area and may result in short-term displacement.
- 7.41 The risk of disrupting the life cycle of marine mammals is extremely low. The geophysical and geotechnical surveys could cause temporary displacement from the immediate area and if it occurs, it will only occur during short periods. Any effect is likely to be quite localized and of relatively short duration. The potential for impact was considered within the Applicant's NIS assessment and Risk Assessment for Annex IV Species.
- 7.42 The survey operations shall comply with the NPWS (2014) "Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters". These guidelines would be deemed adequate to mitigate the negative impacts of the works. Cetaceans in the vicinity of the vessel during start up procedures would be given ample time to leave the site with the soft start procedures outlined in the guidelines. In addition, vessel speeds are extremely slow which would give marine

mammals ample opportunity to move from the area. With the implementation of mitigation measures, there is no significant risk for potential impact on cetacean and any possible disturbance from the works would be contained within the very limited local disturbance from the presence of vessels.

Navigation & Shipping

- 7.43 The Landfall is in Dublin Port, Ireland’s premier port which handles almost half of the traffic in Ireland. The survey area crosses shipping and navigation routes from the port to the UK. There are no anchorages within the survey area. Dublin Port operates Vessel Traffic Services (VTS) in Dublin Bay; however, the survey corridor avoids these VTS zones. The route does pass through an inshore traffic zone just North of Burford Bank. Vessels in the Dublin Port Pilotage Zone in Dublin Bay may be subject to compulsory pilotage by the port pilot. There is one Aid to Navigation situated within the survey area. The Commissioners of Irish Lights is the responsible authority for the principal navigation buoys and lights on or around the coast of Ireland. They provide clear guidelines on navigating safely near their Aids to Navigation. The Aid to Navigation in the survey corridor is an East Cardinal Mark, signifying that it must be passed to the East.
- 7.44 Figure 16 shows AIS data for 2021 representing the vessel traffic in the area, excluding fishing vessels.
- 7.45 During the marine survey operations, survey vessels will display lights, shapes and internationally recognised identification or warning signals. Other vessels will be requested to maintain a safe distance from survey vessels due to their restricted manoeuvrability.
- 7.46 Mitigation measures will be in place to ensure compliance with the International Regulations for Preventing Collisions at Sea and standards, including the issuing of a formal marine notice. Local liaison with fishers will also be undertaken. As the surveys will be temporary and of limited duration, the effect on shipping and navigation is expected to be minor.

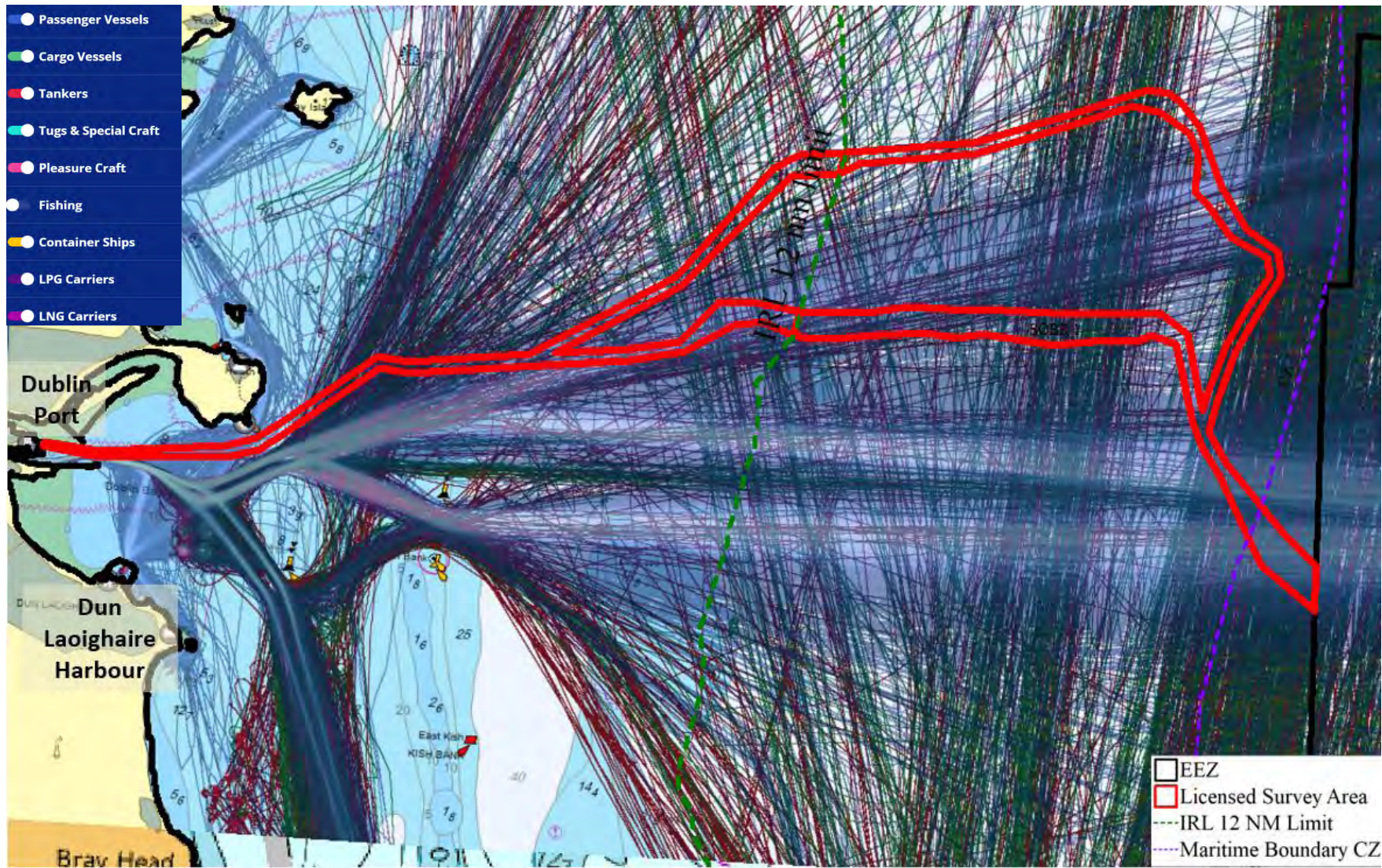


Figure 16. Shipping Traffic (AIS 2021)

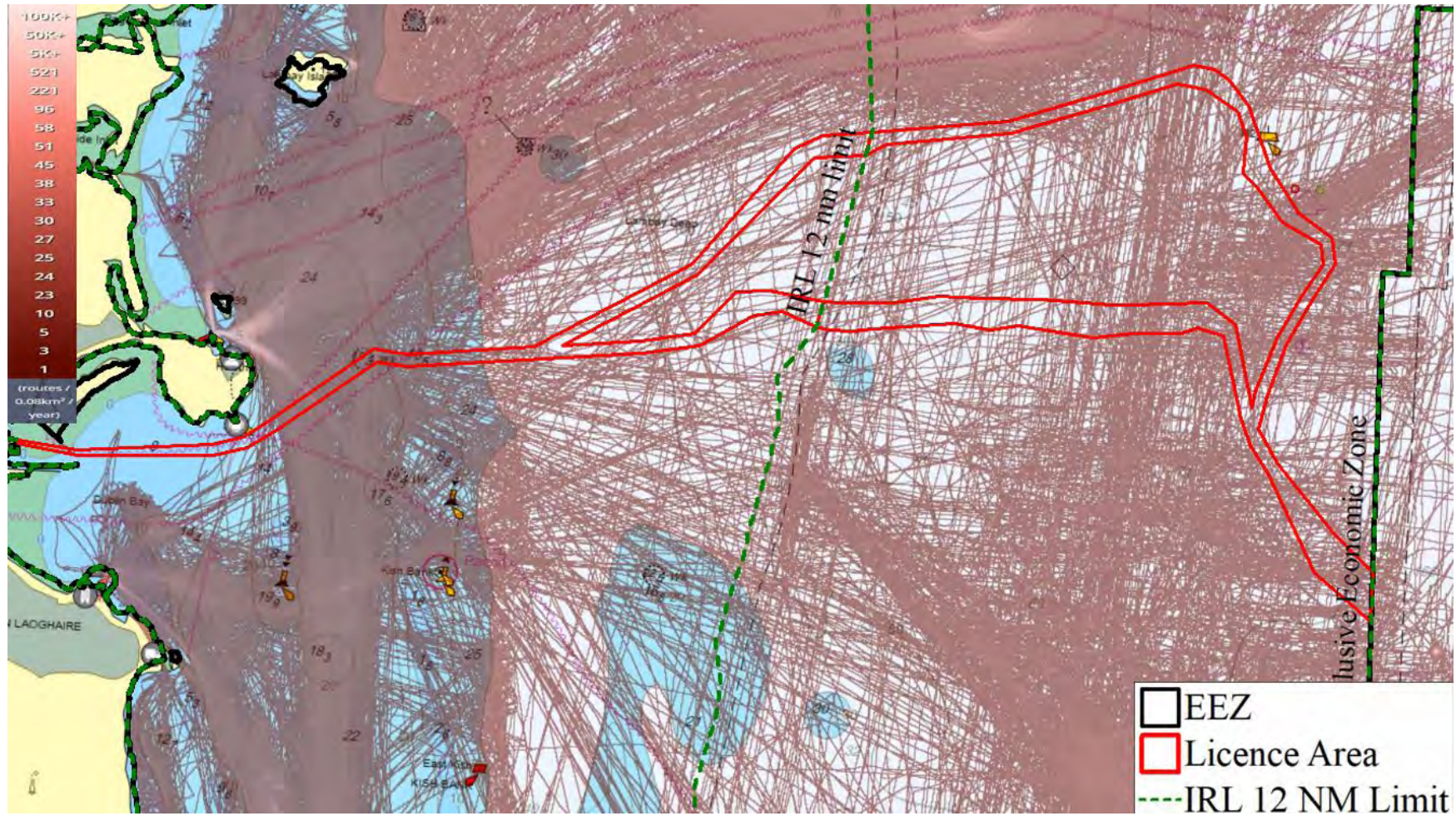


Figure 17. Fishing Vessel Traffic (AIS 2022)

Fisheries

Spawning Grounds

7.47 As outlined by Ellis et al. (2011) “There are numerous modes of reproduction in fishes, and broadcast spawning, which involves shedding the eggs and sperm into the water column, is one of the more frequent strategies (Balon, 1984). Such species may have more extensive spawning grounds than those species which deposit eggs on the sea floor or on biogenic structures. The presence of eggs and larvae of broadcast spawners can be indicative of spawning grounds, although it should be noted that later larval stages may have been advected away from the spawning site. Mature fish with running eggs or sperm can also be indicative of spawning grounds, although these data were not used in the current project, as not all areas have surveys at the right time of year to assess the spawning state.”

Nursery Grounds

7.48 As outlined by Ellis et al. (2011) “The grounds where juveniles are found are termed nursery grounds. It has been suggested that nursery grounds are those sites where juveniles occur at higher densities, have reduced rates of predation, and have faster growth rates than in other habitats, which should result in nursery grounds providing a greater relative contribution to adult recruitment in comparison to non-nursery ground habitats (see Beck et al., 2003; Heupel et al., 2007). Whilst field data are available to highlight areas where juveniles occur at higher densities, comparable data to confirm that they avoid predation more successfully, have enhanced growth rates and provide greater relative contributions to recruitment are generally lacking.”

Conclusions on Fisheries impact from ECIA Report

7.49 The survey route passes through known cod, whiting, haddock, mackerel, and horse mackerel nursery grounds. These nursery grounds span for most of the Irish coastline and therefore the grounds in which the survey works will take place are not of specific importance to this species. The survey route also overlaps with known haddock, cod, and whiting spawning grounds, however, similarly to the nursery grounds these grounds are also quite large and therefore, do not hold significant

importance to these species. Further details on the fish nursery and spawning areas are included in the ECIA Report Appendix II.

- 7.50 There is no significant overlap with fishing activities in the region. The survey works should not result in the direct mortality of any fish species due to the slow-moving nature of the survey vessel or have any long-lasting effects on any habitats of significant importance to any of the fish species. Further information on fisheries is included in the ECIA Report.

Aquaculture

- 7.51 There are no licenced aquaculture sites within the survey area. The closest aquaculture site is over 70 km away from the survey corridor, at the Irish Mussel Seed Company site in Clogga Bay, County Wicklow. The marine survey activities will not impact on aquaculture operations.

Recreation

- 7.52 Dublin and the area around Dublin Bay are a popular tourist destination for recreational marine based activities. There are several yacht clubs and sailing clubs in Dublin Bay. Most of the sailing activity takes place between May and September and is concentrated in the immediate vicinity of Dublin and Dun Laoghaire Harbours, outside the survey area. There is also recreational boating traffic along the coast in the summer months and a limited number of offshore sailing races taking place every year.
- 7.53 Other recreational activities in the area include sea angling, diving, kayaking, canoeing, surfing, sea swimming, board sports such as stand-up paddleboarding, windsurfing & kite surfing and general beach users. Public access will be always maintained during the landfall survey and site investigations.
- 7.54 The nearest RNLI Station is in Dun Laoghaire Harbour, which was founded in 1821 with a Trent class and a D class lifeboat in operation.
- 7.55 During the marine survey operations, survey vessels will display lights, shapes and internationally recognised identification or warning signals. Other vessels and

marine users will be requested to maintain a safe distance from survey vessels due to their restricted manoeuvrability.

- 7.56 Mitigation measures will be in place to ensure compliance with the International Regulations for Preventing Collisions at Sea and standards, including the issuing of a formal marine notice. As the surveys will be temporary and of limited duration, the effect on recreation activities is expected to be minor.

Material Assets

- 7.57 There are three existing subsea cables and no pipelines, oil and gas production facilities or licence blocks, marine aggregate extraction operations or marine outfalls within the survey area. The survey corridor is crossed by Sutton Sewer (Figure 18).
- 7.58 The survey route is crossed by the Celtix Connect, Hibernia Atlantic and ESAT 2 cable systems (Figure 19).
- 7.59 The as-found position of these cables and sewer across the survey route will be confirmed by the marine geophysical survey (marine magnetometer). Any sampling or intrusive site investigations will be positioned a minimum of 100m from the as-found position of these existing cables or 250m from the as-laid position if the position is not confirmed during the geophysical survey. Third party asset owners will be informed prior to survey works commencing. There will be no Grab Samples, CPTs, or Vibrocores near the Sutton to Ringsend sewer, which is deeply buried, and thus there will be no risk to it from the survey operations.

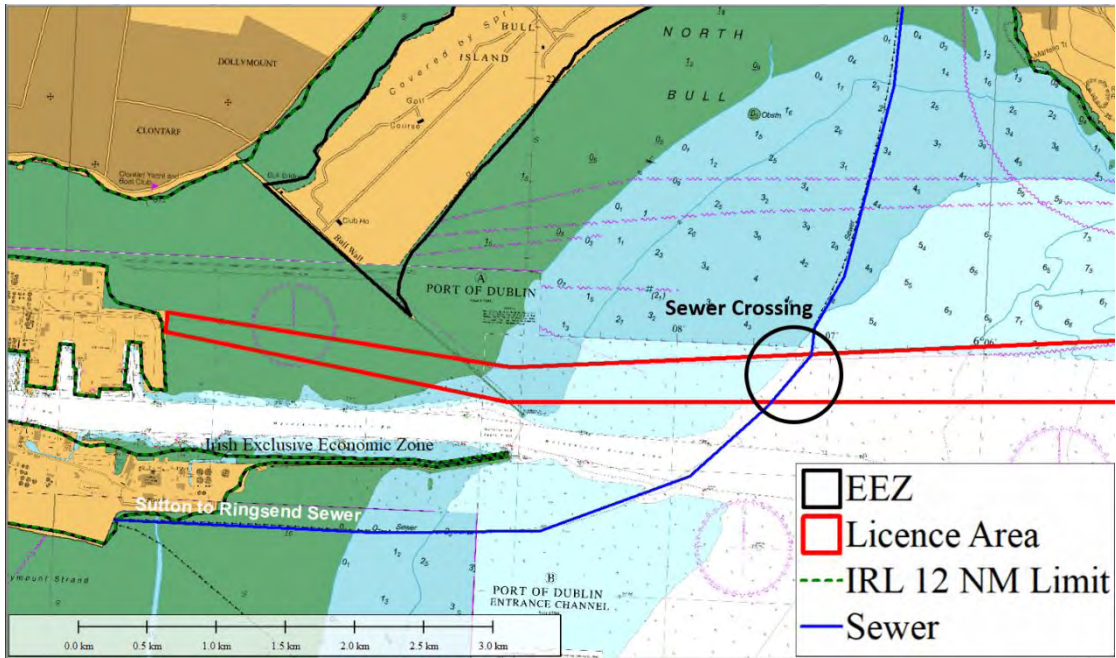


Figure 18. Sutton to Ringsend Sewer crossing Licence Area.

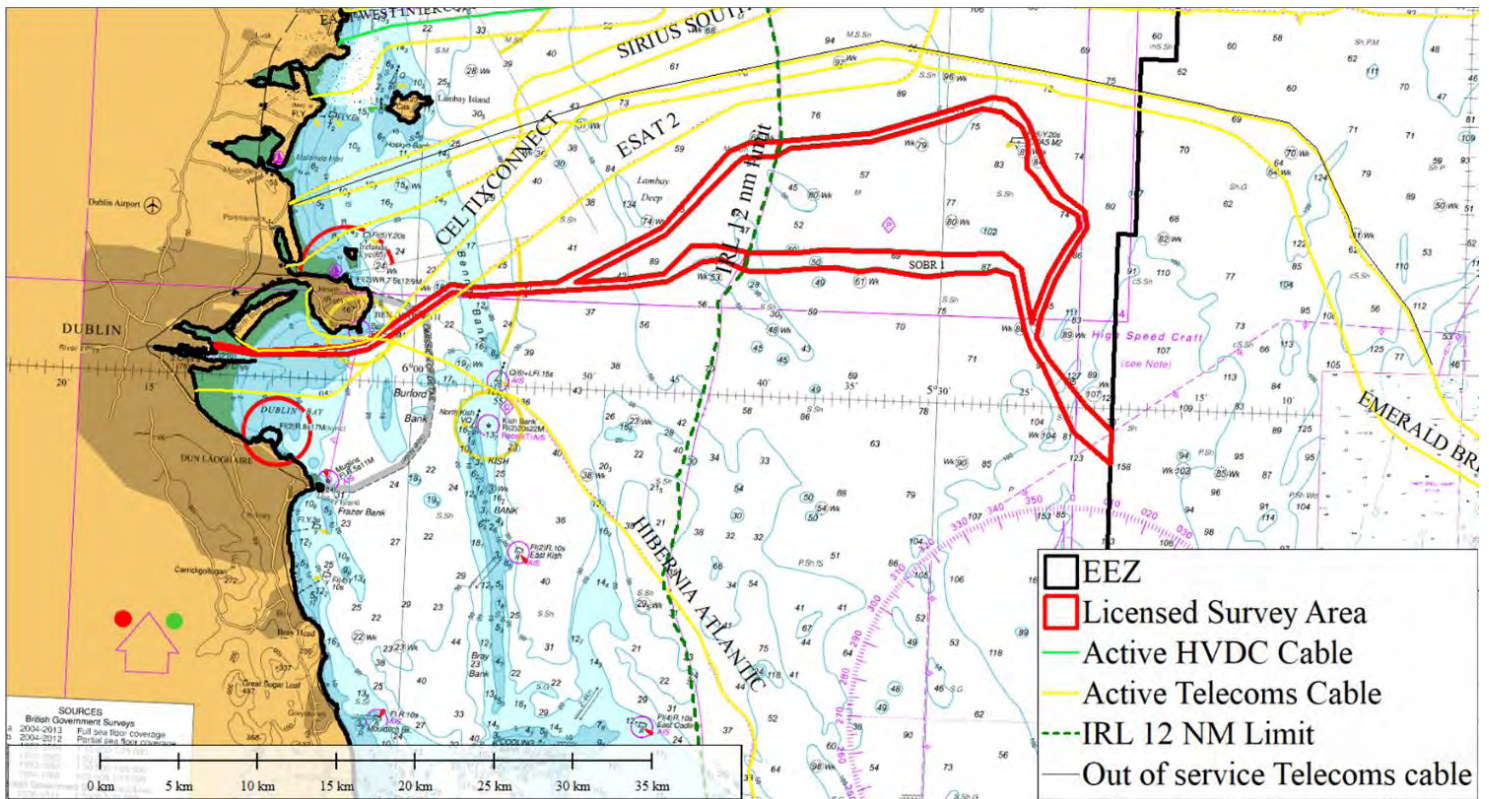


Figure 19. Existing Subsea Assets.

Accidents and Disasters

7.60 Given the nature of the survey operations which will be small scale, temporary and conducted over a short timeframe, they will not influence natural disasters, such as earthquakes, subsidence, landslides, erosion, or flooding. Coastal fog or adverse stormy weather and related sea states can occur in the survey area and wider coastal/offshore marine zones.

7.61 The potential for a major accident to arise because of the marine survey operations is low and will be further minimised through mitigation measures. With relevance to safety of shipping and navigation, mitigation will include publication of a formal Marine Notice, display of lights, shapes and other internationally recognised identification or warning signals on survey vessels and compliance with all requirements of the International Regulations for Preventing Collisions at Sea.

Other developments / Cumulative Impacts

- 7.62 Dublin County Council planning permission applications were examined for potential cumulative impacts due to development in the area. There were no planning applications near the survey corridor.
- 7.63 A review of the DHLGH Foreshore Licence Applications and Determinations search tool (Department of Housing, Local Government and Heritage (DHLGH), August 2023), was undertaken for foreshore licence applications for projects in ‘County Dublin’ and ‘County Meath’ for 2019, 2020, 2021, 2022 and up to 17th July 2023, when the Maritime Area Regulatory Authority (MARA) became operational. The NMPF Activities Map was also consulted for relevant licence applications (MarinePlan.ie, 2023). No further relevant licence applications were identified. This is considered a conservative approach, considering the very temporary and localised nature of the survey and site investigation activities detailed in this application.
- 7.64 Details of these projects, their interaction with the site investigation activities detailed in this Maritime Usage Licence Application and the potential for likely in-combination effects is set out in Table 4.
- 7.65 This report pertains to the survey for a marine fibre optic cable in subtidal and intertidal habitats. As can be seen from using the Best Available Techniques and mitigation measures during survey, considerable effort has gone into minimising the potential environmental impact of the project. “Generally, all mitigation measures applied for individual cables also contribute to reduction of cumulative impacts” (OSPAR, 2012). From a review of the above and Table 4, it is concluded that no projects in the vicinity of the project would be seen to have a significant impact.

No.	APPLICANT	APPLICATION NUMBER	DATE	STATUS	ACTIVITY	DISTANCE FROM SURVEY AREA	POTENTIAL FOR IN-COMBINATION EFFECTS
1	MaresConnect Ltd	FS007635	03/03/2023	Consultation	Site Investigations for Electrical Interconnector	approx. 10 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
2	Tech Works Marine Ltd.	FS007180	21/12/2022	Applied	Data Buoy Deployment	approx. 6 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
3	Irish Water	FS007605	25/11/2022	Consultation	Benthic Survey	approx. 3 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
4	Mac Lir Offshore Wind Limited	FS007472	22/09/2022	Applied	Site Investigations for ORE project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if

							they were to occur at the same time.
5	Greystones OWL Windfarm Limited	FS007367	29/06/2022	Applied	Site Investigations for ORE project	overlapping, 3.2 km of route, 2.6 km ² inside 12 nm limit	According to the report submitted with this application, the works are non-intrusive, and no in-combination effects would occur between the two projects.
6	Codling Wind Park Limited	FS007546	19/05/2022	Determination	Site Investigations for ORE project	overlapping 3.2 km ² over 9.3 km segment of survey route	According to the report submitted with this application, the works in the overlapping area are limited to ecological surveys and are non-intrusive. No in-combination effects would occur between the two projects even if they were happening at the same time
7	Rush Sailing Club	FS006984	10/01/2022	Consultation	Rush Sailing Club Landing Pontoon	approx. 16 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

8	Sunrise Wind Limited	FS007151	23/12/2021	Consultation	Site Investigations for ORE project	overlapping 0.8 km ² over 1.6 km segment of survey route	According to the report submitted with this application, the works are non-intrusive, and no in-combination effects would occur between the two projects.
9	Lir Offshore Array Limited	FS007392	07/12/2021	Applied	Site Investigations for ORE project	approx. 13 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
10	Fingal County Council	FS006909	01/12/2021	Consultation	Construction of a greenway	approx. 12 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
11	RWE Renewables Ireland Ltd.	FS007188	01/10/2021	Determination	Site Investigations for ORE project	overlapping 23 km ² over 45 km segment of survey route	According to the report submitted with this application, the works in the overlapping area are limited to ecological surveys and are non-intrusive. No in-combination effects would occur between the two projects even if they were happening at the same time.

12	Dun Laoighaire Rathdown County Council	FS007290	31/08/2021	Consultation	Fendering Replacement at Carlisle Pier	approx. 6 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
13	Islandbridge Bellevue Developments Limited	FS007406	28/07/2021	Determination	Emergency Works River Wall	approx. 3 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
14	Dublin Port Company	FS007164	23/06/2021	Consultation	Dublin Port Capital Dredging Project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
15	Mainstream Renewable Power Ltd	FS007373	03/06/2021	Consultation	Site Investigations for ORE project	approx. 10 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

16	North Irish Sea Array (NISA) Windfarm Limited	FS007358	31/03/2021	Determination	Site Investigations for ORE project	approx. 18 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
17	Réalt na Mara Offshore Wind Farm Limited	FS007330	24/03/2021	Applied	Site Investigations for ORE project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
18	Dublin Port Company	FS007132	15/02/2021	Determination	Dublin Port Maintenance Dredging	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
19	Dr Grace Cott and Shannon Burke	FS007192	15/01/2021	Consultation	UCD Soil and Vegetation Sampling	approx. 8 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

20	ESB Wind Development Limited (ESB)	FS007134	23/11/2020	Consultation	Site Investigations for ORE project	overlapping 3.6 km ² over 10 km segment of survey route	"The information presented in the NIS concluded that following application of suitable mitigation measures the Site Investigation works, either alone or in-combination with other plans or projects, would not have an adverse effect on the integrity of any Natura 2000 site". Given the nature of the activities proposed under the foreshore licence ORE application for this project, there would be no in-combination effects between them if they were to occur at the same time.
21	Dublin Port Company	FS006893	07/10/2020	Determination	Dublin Port MP2 Project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
22	Leinster Offshore Wind Limited	FS007162	02/10/2020	Applied	Site Investigations for ORE project	approx. 6 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

23	Codling Wind Park Limited	FS007045	22/04/2020	Determination	Site Investigations for ORE project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
24	Irish Water	FS006843	14/04/2020	Applied	Construction of outfall pipeline	approx. 6 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
25	Celtix Connect Limited	FS006915	09/01/2020	Determination	Installation and maintenance of a fibre optic Havhingsten Telecommunications Cable	approx. 18 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
26	Statkraft Ireland Ltd.	FS007031	17/12/2019	Determination	Site Investigations for ORE project	approx. 15 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

27	Innogy Renewables Ireland	FS007029	26/09/2019	Determination	Site Investigations for ORE project	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.
28	Dublin Port Company	FS006980	08/04/2019	Determination	Maintenance Dredging in Dublin Port	approx. 500 m	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.

Table 4. Dublin Foreshore Licences.

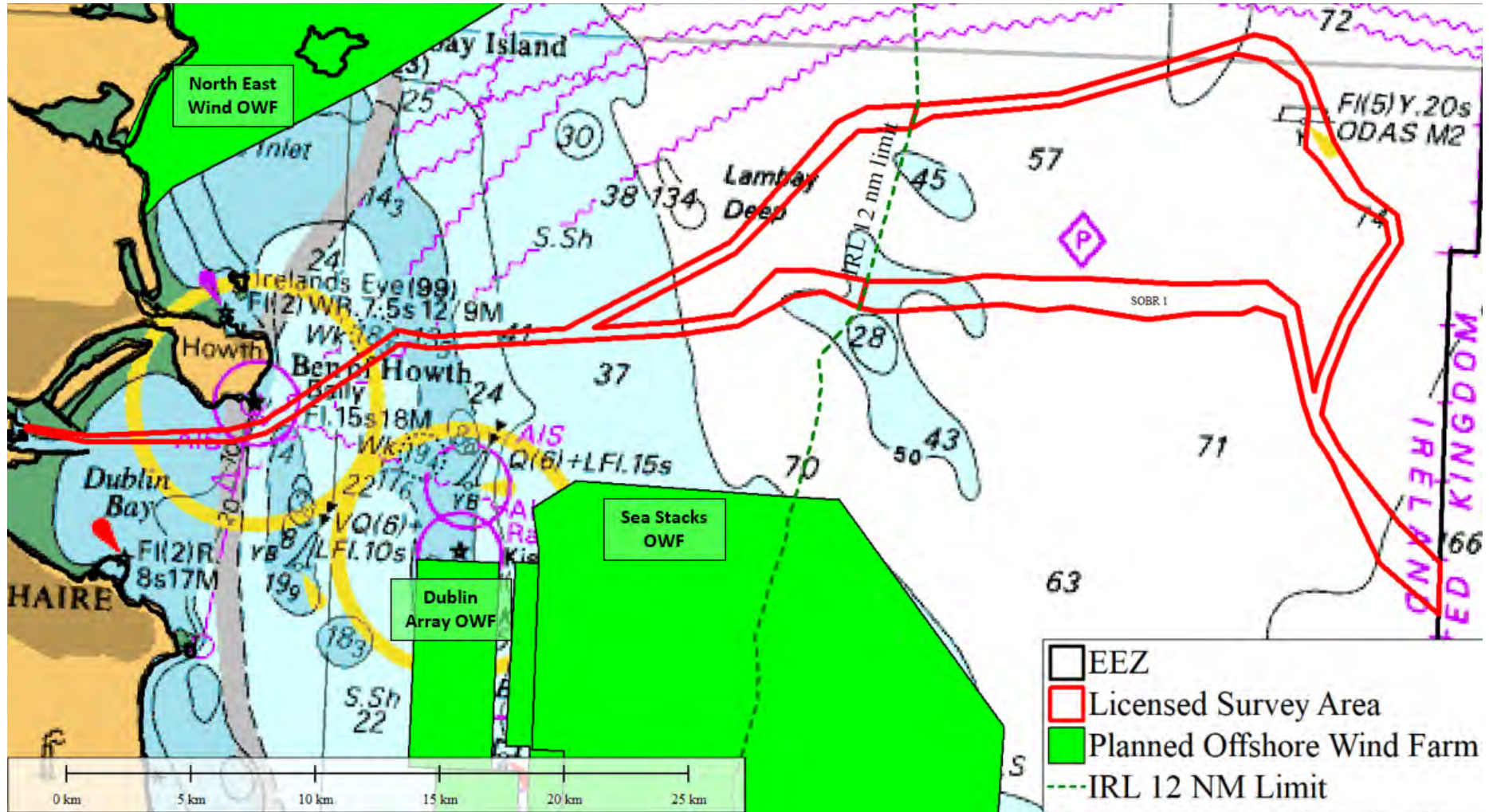


Figure 20. Planned Offshore Wind Farms near Licence Area.

Equipment Type	Purpose	Frequency Range	Duration	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Multibeam Echo Sounder (MBES)	Measure detailed bathymetry by transmitting sound pulses (active sonar).	200 kHz to 500 kHz	0.05 - 10 ms	210 - 245 dB.	Danson 2005, Hopkins 2007, DECC 2011, Lurton and DeReutier 2011, Lurton 2016, BEIS 2020, Crocker & Fratantonio 2016
Side Scan Sonar (SSS)	Determine surficial nature of the seabed and detect objects by transmitting sound pulse.	200 kHz to 700 kHz	0.4 - 1.0 ms	200 - 240 dB.	BOEM 2016, BEIS 2020, DAHG 2014, Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Pinger	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 15 kHz	0.5 - 30 ms	214 dB.	Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Chirper	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 13 kHz	5 - 40 ms	185 - 215 dB.	Crocker & Fratantonio 2016, Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Boomer	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	500 Hz to 15 kHz	0.5 - 1.0 ms	205 - 215 dB.	Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Parametric	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	4 to 15 kHz, 85 to 115 kHz	0.2 - 30 ms	238 - 247 dB. 200 - 206 dB.	Hartley Anderson 2020
Ultra-Short Base Line (USBL)	Subsea positioning.	20 kHz to 50 kHz	5 - 10 ms	194 - 207 dB.	Kongsberg
Magnetometer	Identify ferrous anomalies for metal obstructions, shipwrecks, etc. on and under the seabed.	Passive	N/A	Passive	N/A
Survey Vessels	Carry out the survey and deploy the equipment.	50 Hz to 300 Hz	N/A	160 - 190 dB.	DECC 2011

Table 5. Marine Survey Activities.

Equipment Type	Purpose	Number of locations within Licence Area (up to)	Frequency Range	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Cone Penetration Test (CPT)	Determine geotechnical engineering properties of seabed sediments.	37	28 Hz	118 - 145 dB.	BOEM 2012, EIRGRID 2014
Gravity Corer	Retrieve a seabed sediment sample by penetrating seabed with a steel core barrel under self-weight	33	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	33	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	19	N/A	N/A	N/A

Table 6. Marine Site Investigation Activities.

8.0 MITIGATION MEASURES & MONITORING

8.1 Specific controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (Zoi) within / proximate to the subject site are outlined below.

8.2 Minor short-term impacts may result because of the survey phase of the project, but these are believed not to be at the scale to impact on designated conservation sites, species, or the site-specific conservation objectives. However, following the precautionary principle, mitigation measures have been developed to minimise the ecological impacts of the project, in relation to Natura 2000 Annex habitats and species. This is primarily because of noise disturbance and the potential for pollution within the marine environment.

[Route Planning within the landfall area.](#)

8.3 A strict route selection process was carried out to assess the optimal route and landfall site, considering the lowest environmental impact, highest resource efficiency and wave exposure using sound and comparable data. This included addressing engineering issues as well as environmental concerns and assessing existing infrastructure.

Disturbance

- The proposed survey route is within a busy port. As a result, the presence of additional personnel on the shore, intertidal and subtidal would not cause a significant additional disturbance. However, there is potential for disturbance of the mudflats and sandflats and as a result the following mitigation measures would be carried out:
- An ecologist would be onsite during the surveys within the terrestrial/intertidal and subtidal within Dublin Bay to minimise disturbance and ensure site integrity is maintained.
- Drift lines and vegetation on the shore near the proposed route would contain the highest proportion of potential food source for bird species. If present, these should be avoided by machinery and personnel.
- Any temporary access arrangements or structures that are put in place will be prepared in consultation with an ecologist and the site should be fully reinstated post works.

Reinstatement

- Reinstatement of the terrestrial and intertidal habitat should be carried out to pre-construction conditions. Any concerns in relation to the survey process or resulting reinstatement of the habitat to pre survey conditions will be raised with NPWS by the project ecologist prior to the removal of personnel from the site.

Subtidal

- Mitigation impacts are primarily concerned with the survey and the following mitigation measures would be enforced.
- Mitigation measures will include the presence of a MMO onboard the survey vessel. The purpose of the MMO is to ensure that there is no disturbance of seal /cetacean populations.
- The NPWS Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters' (NPWS, 2014) should be followed throughout the survey.
- The MMO/ecologist will ensure that mitigation measures are carried out. Sufficient resources should be made immediately available on the survey vessel to deal with accidental oil spills including hydraulic hoses bursting etc. and reported to the on-board ecologist.
- The vessels operating within Dublin Bay will be inspected by the ecologist for pollution sources. Any pollutions sources identified by the ecologist to form a risk to the European Sites will be rectified immediately before works commence/recommence. The ecologist will maintain a watching brief in relation to pollution risks and observations. A spill kit will be on board the vessel.

9.0 CONCLUSION

This report has been undertaken based on the information in the Schedule of Works, Works Methodology, Supporting Information Report to inform AA Screening, Applicant NIS, Ecological Impact Assessment (EclA) and Archaeological Impact Assessment Study and the implementation of mitigation measures. The nature, scale and location of the survey is such that there are no foreseeable significant effects on the environment arising from the survey operations. It is the conclusion of the Assessment of Impact on the Maritime Usage Report and screening exercise that an EIA is not required.

Common Abbreviations

AA	Appropriate Assessment
AIMU	Assessment of Impact on the Maritime Usage
AIS	Automatic Identification System
BIM	Bord Iascaigh Mhara
CO	Conservation Objective
CPT	Cone Penetration Test
DAFM	Department of Agriculture, Food and the Marine
DAHG	Department of Culture, Heritage and the Gaeltacht
DHLGH	Department of Housing, Local Government and Heritage
EC	European Commission
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EPA	Environment Protection Agency
EPS	European Protected Species
EU	European Union
FLO	Fisheries Liaison Officer
HABs	Harmful Algal Blooms
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
ISO	International Organization for Standardization
ITM	Irish Transverse Mercator
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effects
MAP	Marine Area Planning Bill
MARA	Maritime Area Regulatory Authority
MARPOL	The International Convention for the Prevention of Pollution from Ships
MBES	Multibeam echosounder
MI	Marine Institute
MMO	Marine Mammal Observer
NIS	Natura Impact Statement
NM	Nautical Mile
NMPF	National Marine Planning Framework
NPWS	National Parks and Wildlife Service
PTS	Permanent Threshold Shift
SCI	Special Conservation Interest
SISAA	Supporting Information for Screening for Appropriate Assessment
SPL	Sound Pressure Level
SSS	Side Scan Sonar
SWD	Shellfish Waters Directive
TTS	Temporary Threshold Shift
UTM	Universal Transverse Mercator
VC	Vibrocore
VMS	Vessel Electronic Monitoring System
WGS	World Geodetic System

10.0 REFERENCES

BEIS. (2020). Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SAC.

Bureau of Ocean Energy Management (BOEM) Office of Renewable Energy Programs (2012). Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Massachusetts, Environmental Assessment. Published by U.S. Department of the Interior. October 2012.

Bureau of Ocean Energy Management (BOEM) (2016). Characteristics of sounds emitted during high resolution marine geophysical surveys U.S. OCS Study BOEM 2016-044 NUWC-NPT Technical Report 12.

Crocker SE, Fratantonio FD. 2016. Characteristics of High-Frequency Sounds Emitted During High-Resolution Geophysical Surveys. OCS Study, BOEM 2016-44, NUWC-NPT Technical Report 12, 203pp.

D’Amico AD, Pittenger R. 2009. A brief history of active sonar. Aquatic Mammals 35(4), 426-434.

Danson, E. (2005). Geotechnical and geophysical investigations for offshore and nearshore developments. Technical Committee 1, International Society for Soil Mechanics and Geotechnical Engineering, September 2005.

DECC (2011), Review and Assessment of Underwater Sound Produced from Oil and Gas Sound Activities and Potential Reporting Requirements under the Marine Strategy Framework Directive. Document No: J71656-Final Report –G2

Department of Arts, Heritage and Gaeltacht (2014), Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.

Department of Housing, Local Government and Heritage (2021), National Marine Planning Framework.

Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. and Brown, M.J. (2011). Science Series Spawning and nursery grounds of selected fish species in UK waters. [online] Available at: <https://www.cefas.co.uk/publications/techrep/TechRep147.pdf>.

EC, 2023, The European Commission, The Habitats Directive, https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

Hartley Anderson (2020), underwater acoustic surveys: review of source characteristics, impacts on marine species, current regulatory framework and recommendations for potential management options. NRW Evidence Report No: 448, 136pp, NRW, Bangor, UK.

Hildebrand JA, 2009. Anthropogenic and natural sources of ambient noise in the ocean. Marine Ecology Progress Series 395, 5-20.

Hildebrand JA. 2005. Impacts of anthropogenic sound. In: Reynolds JE, Perrin WF, Reeves RR, Montgomery S, Ragen TJ (eds) Marine mammal research: conservation beyond crisis. Baltimore: The Johns Hopkins University Press p101-124.

Hopkins, A. (2007). Recommended operating guidelines (ROG) for swath bathymetry. MESH.

IWDG (2017) Picton B.E., Emblow, C.S., Morrow, C.C., Sides, E.M., Tierney, P., McGrath, D., McGeough, G., McCrea, M., Dinneen, P., Falvey, J., Dempsey, S., Dowse, J. and Costello, M. J. Title and year: (2017). Marine sites, habitats and species data collected during the BioMar survey of Ireland. National Biodiversity Data Centre. Occurrence Dataset <https://doi.org/10.15468/cr7gvs> accessed via GBIF.org on 2017-07-19.

Lam F-P, Kvadsheim PH, Isojunno S, van IJsselmuide S, Wensveen PJ, Hansen RR, Sivle LD, Kleivane L, Martín López LM, Benti B, Dekeling R, Miller PJO. 2018. Behavioral response study on the effects of continuous sonar and the effects of source proximity on sperm whales in Norwegian waters - The 3S-2017 Cruise Report. TNO Report TNO 2018 R10958, 54pp plus appendices.

LGL Alaska Research Associates and Jasco Applied Sciences (2010), Marine Mammal Monitoring and Mitigation during Marine Geophysical Surveys by Shell Offshore Inc. in the Alaskan Chukchi and Beaufort Seas, July – October 2010:90-Day Report

Lurton X, DeRuiter SL. 2011. Sound radiation of seafloor-mapping echo sounders in the water column, in relation to the risks posed to marine mammals. International Hydrographic Review, Nov 2011, 11pp.

Lurton X. 2016. Modelling of the sound field radiated by Multibeam echo sounders for acoustical impact assessment. Applied Acoustics 101, 201-221.

MarinePlan.ie. 2023. Activities Map (BETA). Available at: <https://marineplan.ie/?page=Activities-Map-%28BETA%29>.

NBDC (2022) Biodiversity Maps, Maps - Biodiversity Maps (biodiversityireland.ie)

NPWS (2019) Article 17 Summary,
https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol1_Summary_Article17.pdf
Pei Y, Kan G, Zhang L, Huang Y, Liu Z, Liu B, Yan K. 2019. Characteristics of source wavelets generated by two sparkers. *Journal of Applied Geophysics* 170, 103819.

Risch D, Wilson B, Lepper P. 2017. Acoustic assessment of SIMRAD EK60 high frequency echo sounder signals (120 & 200 kHz) in the context of marine mammal monitoring. *Scottish Marine and Freshwater Science* Vol. 8, No. 13, published by Marine Scotland Science, 27pp.

Wall D., Murray C., O'Brien J., Kavanagh L., Wilson C., Ryan C., Glanville B., Williams D., Enlander I., O'Connor I., McGrath D., Whooley P. and Berrow S., 2013. Atlas of the distribution and relative abundance of marine mammals in Irish offshore waters 2005 - 2011. Irish Whale and Dolphin Group, Merchants Quay, Kilrush, Co Clare.

Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P. and Tyack, P.L. (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals*, 45(2), pp.125–232. doi:10.1578/am.45.2.2019.125.