

Hartley Anderson Limited

Marine Environmental Science and Consultancy

Screening for Appropriate Assessment

Inis Ealga Marine Energy Park site investigations off County Cork, Foreshore Licence Application Ref. No. FS007404

Report to
Department of Housing, Local Government
and Heritage



July 2022

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SECTION 1 - INTRODUCTION

1.1 Background

Inis Ealga Marine Energy Park (IEMEP) Ltd, a subsidiary project company of DP Energy Ireland (DPEI), is investigating the feasibility of developing an offshore floating wind farm off the south coast of Ireland, the Inis Ealga Marine Energy Park (IEMEP).

IEMEP Ltd previously (in December 2019) submitted a Foreshore Licence Application (FLA) (Reference: FS006859) for the proposed turbine area (Array Investigation Area) and export cable corridors to the Department of Housing, Local Government and Heritage (DHLGH). Public consultation was conducted on the FLA between 11 March 2020 and 4 June 2020. The FLA is currently awaiting a licence decision.

Arup with Hartley Anderson Limited have been commissioned by DHLGH to conduct a Screening for Appropriate Assessment (AA) (stage 1 screening for the likelihood of significant effects on Natura 2000 sites), from an application by IEMEP Ltd for a Foreshore Licence to undertake site investigation works for an additional potential export cable corridor connecting the Array Investigation Area with a landfall between Clonard and Ballymacoda, Co. Cork. The purpose of the proposed site investigations is to gather sufficient geophysical, geotechnical, environmental, archaeological and ecological information to assess suitability for cable routing and other electrical infrastructure associated with the site.

This cable corridor has been identified for site investigation due to the precedence established by the Celtic Interconnector development (ABP consent application ref. A04.310798) and feedback to DPEI from stakeholders requesting greater consideration of those areas already under development for other projects such as the Celtic Interconnector.

1.2 Application documents submitted

A number of application documents submitted by IEMEP have informed this AA Screening, including:

- Application form [Applicant: IEMEP]
- Foreshore Licence Map
- Environmental Supporting Information [Intertek Energy & Water Consultancy Services 2021]
- Schedule of Survey Works [Intertek Energy & Water Consultancy Services 2021]
- Public Consultation
 - Public submissions
 - Applicant's Response to Public Submissions
- Prescribed Bodies Consultation
 - Prescribed Bodies Observations
 - Applicant's response to Prescribed Bodies Observations

On the 26th May 2022 a meeting was held between the DHLGH, the Applicant and the Independent Environmental Consultant (IEC) appointed by DHLGH to appraise FLA FS007404 to discuss points for consideration as raised by the IEC. An Explanatory Note in response to queries raised by the IEC was produced by IEMEP in June 2022.

1.3 Relevant consultation responses

The licence application was open for public consultation between 21st October 2021 to 19th November 2021.

Consultation responses from the prescribed bodies are provided in Table 1.1. Table 1.2 summarises observations made by the public and associated responses from the Applicant. Note that most of the responses are not directed at the Habitats Directive aspects of the proposal.

Table 1.1: Responses from prescribed bodies to the consultation

Statutory Body	Applicant's Response
<p>Inland Fisheries Ireland (IFI): Marine Licence Vetting Committee IFI have had the following comments in relation to the foreshore licence application:</p> <p>Mitigation measures in regard to the timing of the works and also in regard to levels and duration of noise generation and potential for adverse impact on fish species should be agreed with Foreshore Division DHPCLG and form part of any foreshore licence. IFI would point out that the mitigation measures and guidance of NPWS in regard to marine mammals are not transferable to fish species. The fish remain invisible to any shore- or boat-based observer. Mitigation measures should aim to reduce the sound generated, in intensity and duration. Seasonality of the sampling and a short sampling window may also provide some mitigation.</p> <p>The Environmental supporting document statement states only shad are sensitive to underwater noise from geophysical surveys. It may be the case that, although salmon and other hearing-generalist species may not 'hear' sound they may not be immune to any adverse physical or physiological impact of the transmitted sound.</p> <p>The geophysical works are scheduled to take place in Spring/Summer 2022 with a 3 month window of mid April to mid July. This timing will coincide with the Shad and Sea Lamprey spawning along with salmon smolts leaving the freshwater catchments.</p> <p>The mitigations measures for fish should cover:</p> <ul style="list-style-type: none"> • Reduction in the number of sound-requiring test types to be employed • Use of soft-start and ramp-up procedures for any sound-generating surveys undertaken — both on a day-to-day basis and on re-start after any stoppages within any day duration of noise-generating surveys to be reduced to the minimum necessary to collect results of sufficient quality • Agreed timing of works so as not to interfere with migration times of fish life stages • Short sampling window to mitigate long term effects 	<p>Recommendations for mitigation measures for fish The mitigation measures recommended by IFI on page 2 of its submission are noted. When considering these recommendations, Inis Ealga Marine Energy Park Ltd. would like to request that the Department also consider that the design of the proposed site investigations has yet to be finalised. In particular, the activities which are likely to generate the most noise will not be fully designed, specified, procured, and executed until the initial survey activities have been completed. This approach allows the results of the initial site investigations to inform the design of the more detailed site investigations. An obligation on Inis Ealga Marine Energy Park Ltd. to work to mitigate potential impacts using careful survey design and by adhering to best practice is suggested, as opposed to inclusion of more specific conditions in any Foreshore License granted.</p> <p>The document submitted in support of the application for Foreshore Licence as 'Foreshore Licence Application: Supporting Information for Screening for Appropriate Assessment' sets out in Section 3, a description of the receiving environment including Fisheries & Aquaculture as Section 3.2. Potential Environmental Impacts are appraised in Section 4, including potential disturbance from underwater noise associated with the proposed site investigations (see Section 4.2) and potential injury due to collision (see Section 4.3).</p> <p>EP Energy's Community and Stakeholder Liaison Manager will engage with all businesses in the vicinity of the proposed survey area, including local angling clubs and charter companies, ahead of the proposed site investigations taking place.</p> <p>And, Inis Ealga Marine Energy Park Ltd. will engage with those other projects in the vicinity of Inis Ealga Marine Energy Park to ensure that survey activities are co-ordinated such as to minimise potential adverse effects on marine mammals and local fish populations</p>

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<p>The south and southeast coast of Ireland is a world-renowned location for recreational angling with angling centres and charter skippers located from Dungarvan to Baltimore. The impact of works on the species and their habitats should be incorporated into the faunal surveys. We note the appointment of a fisheries liaison officer however the recreational angling sector should also be consulted on and advised in advance of when works will be undertaken.</p> <p>The application highlights the potential for cumulative impacts due to other works taking place in the vicinity. IFI would be concerned with the overlap in area and the potential for prolonged noise generating works if coordination of efforts are not undertaken. The relevant foreshore applicants should liaise to ensure there is sufficient time gap between works to reduce the impact on the local fish population. The effect of cumulative impacts on the ecosystem needs to be assessed by the DHLGH.</p> <p>The location of the cable route connection should be well designed taking into account the presence of cartilaginous fish and eel migration pathways as these fish can be affected by electromagnetic fields.</p> <p>The Environmental supporting information report outlines the general requirements highlighting methods to ensure the proper handling and storing of hazardous materials. Any risk of pollution to the aquatic environment must be addressed with sufficient control mechanisms and emergency response plans.</p>	
<p>Department of the Housing, Local Government and Heritage (DHLGH): Development Applications Unit (DAU) Outlined below are heritage-related observations/recommendations co-ordinated by the Development Applications Unit under the stated headings.</p> <p>Archaeology It is noted that the foreshore licence application by Inis Ealga Marine Energy Park (IEMEP), a subsidiary company of DP Energy Ireland (DPEI) for site investigation works for offshore windfarm at Inis Ealga, off Cork coast and intention to include an archaeological assessment. It is further noted that the schedule of proposed works are for geophysical survey in advance of all other works. The proposed site investigation works are located within areas of high archaeological potential, for areas within the coastal, foreshore/intertidal and subtidal environments. Given the</p>	

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<p>location of the proposed sites and associated works, it is possible that underwater cultural heritage (UCH) and adjacent archaeology (e.g. upper foreshore/coastal and terrestrial) may be impacted by both site investigation works (grab sampling, etc.) and full works thereafter.</p> <p>It is a recommendation of this Department that the services of a suitably qualified and suitably experienced should be engaged to carry out the Underwater Archaeological Impact Assessment (UAIA) in advance of the geophysical survey, to inform on the potential for UCH to be present in the areas that are to be the focus of survey.</p> <p>A synopsis of the following as appended to end of this letter and should be attached as conditions to any Foreshore Licence that may be granted:</p> <p>Archaeological Consultant</p> <ul style="list-style-type: none"> • A licence-eligible, suitably qualified underwater archaeologist should be engaged to carry out the Underwater Archaeological Impact Assessment (UAIA). • The archaeologist should also be suitably experienced, with a track record in dealing with marine and offshore developments, resultant report submission, etc. • The archaeologist should also be suitably experienced, with a track record in dealing with and the interpretation of marine geophysical data for archaeological purposes, including ensuring it is of sufficient specification for the identification of underwater cultural heritage. • A detailed method statement should accompany their licence applications to the National Monuments Service for consideration (both for a Dive Survey Licence to cover the UAIA and a Detection Device Licence to cover the geophysical survey assessment for archaeological purposes and foreshore survey). The licences shall be issued as required under the National Monuments Acts 1930-2004. • The archaeologist should be compliant with all licensing requirements, including being up to date with report submissions, etc. <p>Desktop Study</p>	

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<ul style="list-style-type: none"> • A detailed archaeological desktop study should be carried in advance to address all relevant sources to inform on the proposed site investigation study locations and areas that are to form the location for the offshore windfarm. • The desktop study should address the coastal, foreshore and offshore areas. • While the application is for a Foreshore Licence, it is advised that the desktop study also include any proposed terrestrial/onshore works, so that all the proposed works can be assessed as one project, ensuring efficiencies in the archaeological assessment. • All relevant sources should be consulted including but not limited to: The WIID and HEV; The Topographical Files of the National Museum of Ireland; published journalistic sources, local sources, relevant historic charts, maps, etc. • The desktop study should seek to inform on the archaeological potential of the areas and the significance of any identified cultural heritage. <p>Field Survey</p> <ul style="list-style-type: none"> • For the current application a field survey (e.g. of foreshore and coastal areas and areas to be impacted by future landfall works), will not be required. However, such a survey will be required in advance of any SI works in the foreshore and landward environments. • The survey will be as follows: • A detailed visual walk-over survey accompanied by a metal detection survey of the areas on the foreshore/intertidal zone should be undertaken in advance of any SI works, as part of the UAIA. • It is advised that if there are to be terrestrial works for any landings, then this too is assessed by way of archaeological survey and inspection at this point. • All identified sites, features or anomalies should be georeferenced and mapped to ensure a positive location is given for them, which in turn can inform on exclusion zones or the need for further archaeological mitigation. • The foreshore/intertidal survey should be undertaken at maximum low water spring tides, to allow the widest area to be assessed. 	

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<p>Geophysical Surveys</p> <ul style="list-style-type: none"> The proposed geophysical surveys should be licenced under the National Monuments Acts 1930-2014. All relevant geophysical surveys should be carried out in advance of any impacts by the proposed Site Investigation/Geotechnical works and in advance of the deployment of metocean monitoring equipment, to ensure all potential impacts to the underwater cultural heritage is avoided. The geophysical surveys shall be carried out in compliance with the Department's specifications for the undertaking of Marine Geophysical Survey for Archaeological Purposes. <p>UAIA Report</p> <ul style="list-style-type: none"> Once the UAIA has been done, the full information should be compiled into a report and submitted to the Underwater Archaeology Unit, National Monuments Service for review and further comment. The applicant shall be prepared to be advised by the Department in this regard. Results of the Desktop study, geophysical data interpretation, etc. shall be compiled. For wrecks and other sites identified, or the potential location of same, the results should be reviewed by the applicants and the archaeologists and appropriate exclusions placed around them to ensure they are avoided by the proposed SI works. Detailed charts showing the location of the proposed SI works in relation to all geophysical anomalies and all proposed exclusion zones should be forwarded to the Department for review and agreement in advance of works proceeding. The UAIA Report should contain a detailed Impact Assessment to address all identified cultural heritage and should also make recommendations on mitigation measures to avoid all impacts to the archaeology. If potential or identified sites, features or artefacts cannot be avoided (preservation in situ), then the UAIA Report Recommendations should put forward an archaeological mitigation to address this, including preservation by record (archaeological testing and/or full archaeological excavation). 	

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<p>Site Investigation Works</p> <ul style="list-style-type: none"> • The UAIA Report Recommendations should put forward a methodology for the archaeological monitoring of Site Investigation works. Such a strategy may include that all trial pits and other SI works on the foreshore should be archaeologically monitored while the UAIA Recommendations should propose a scaled monitoring for the offshore SI works (particularly grab samples). • The results of all SI works should be made available to the consultant archaeologist for review, including core samples, etc. Such assessment would seek to identify any cultural material contents, evidence for palaeo-environments, etc. • A follow up Archaeological Report detailing the results of the SI samples should be forwarded to the Department for review and consideration and to inform any future Foreshore/Planning application for the proposed offshore windfarm. <p>Once the Underwater Archaeology Unit, National Monuments Service, Department of Culture, Heritage and the Gaeltacht have had the opportunity to review the UAIA Report, we may issue further recommendations. It should be borne in mind that should significant archaeological remains be identified, further archaeological mitigation may be required.</p> <p>Synopsised requirements to be included as a CONDITION on any Foreshore Licence issued</p> <ul style="list-style-type: none"> • A licence-eligible, suitably qualified underwater archaeologist should be engaged to carry out the Underwater Archaeological Impact Assessment (UAIA). • The archaeologist should also be suitably experienced, with a track record in dealing with marine and offshore developments, resultant report submission, etc. and should be fully compliant with the licensing requirements for report submission. • The archaeologist should also be suitably experienced, with a track record in dealing with and the interpretation of marine geophysical data for archaeological purposes, including ensuring it is of sufficient specification for the identification of underwater cultural heritage. 	

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<ul style="list-style-type: none">• A detailed method statement should accompany their licence applications to the National Monuments Service for consideration (both for a Dive Survey Licence to cover the UAIA and a Detection Device Licence to cover the geophysical survey assessment for archaeological purposes and foreshore survey). The licences shall be issued as required under the National Monuments Acts 1930-2004.• A detailed visual walk-over survey accompanied by a metal detection survey of the areas on the foreshore/intertidal zone should be undertaken in advance of any SI works, as part of the UAIA.• The proposed geophysical surveys should be licenced under the National Monuments Acts 1930-2014. All relevant geophysical surveys should be carried out in advance of any impacts by the proposed Site Investigation/Geotechnical works and in advance of any deployment of metocean monitoring equipment, to ensure all potential impacts to the underwater cultural heritage is avoided.• Once all surveys and interpretations have been done, the full information should be compiled into a UAIA report and submitted to the Underwater Archaeology Unit, National Monuments Service for review and further comment.• The UAIA Report should contain a detailed Impact Assessment to address all identified cultural heritage and should also make recommendations on mitigation measures to avoid all impacts to the archaeology. If potential or identified sites, features or artefacts cannot be avoided (preservation in situ), then the UAIA Report Recommendations should put forward an archaeological mitigation to address this, including preservation by record (archaeological testing and/or full archaeological excavation).• The UAIA Report Recommendations should put forward a methodology for the archaeological monitoring of Site Investigation works. Such a strategy may include that all trial pits and other SI works on the foreshore should be archaeologically monitored while the UAIA Recommendations should propose a scaled monitoring for the offshore SI works (particularly grab samples).• The results of all SI works should be made available to the consultant archaeologist for review, including core samples, etc. Such assessment	

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<p>would seek to identify any cultural material contents, evidence for palaeo-environments, etc.</p> <ul style="list-style-type: none"> The applicant shall be prepared to be advised by this Department in regard to the recommendations made in the UAIA or any subsequent recommendations that may issue by us. 	
<p>Department of the Housing, Local Government and Heritage (DHLGH): Marine Advisor, Environment</p> <p>The Marine Advisor, Environment, acknowledges the proposed licence area is located within Ardmore Head SAC (IE0002123), Cork Harbour SPA (IE0004030) and Helvick Head to Ballyquin SPA (Site IE004192). It is within 2km of a further four Natura 2000 sites.</p> <p>The Marine Advisor quotes the following:</p> <p>Assessment Process</p> <p>The Minister for Housing, Local Government and Heritage, is responsible for carrying out environmental screening and any environmental assessments determined as being required following screening, in accordance with the requirements set out in Directive 92/43/EEC (Habitats Directive), Directive 2009/147/EC (Birds Directive) and Directive 2011/92/EU, as amended by Directive 2014/52/EU (EIA Directive), in respect of applications under the The Foreshore Act 1933, as amended. Outside of the Directives, the Minister is also required to consider environmental issues in respect of applications under the Foreshore Act 1933, as amended.</p> <p>Habitats Directive</p> <p>The Appropriate Assessment process (AA) is an assessment of the potential for adverse or negative effects of a plan or project, in combination with other plans or projects, on the conservation objectives of a European Site (Natura 2000 site). The focus of AA is targeted specifically on Natura 2000 sites and their conservation objectives.</p> <p>Article 6(3) and 6(4) of the Habitats Directive place strict legal obligations on Member States to regulate the conditions under which development that has the potential to impact on European Sites can be proceed. It requires that an Appropriate Assessment be carried out of plans or projects, not directly</p>	<p>The submission made by the Department of Housing Local Government and Heritage, Marine Advisor, Environment, is noted, including the reference to requirement for Risk Assessment for Annex IV Species. Inis Ealga Marine Energy Park Ltd. trusts that the Risk Assessment for Annex IV Species submitted as distinct document in support of FS007404 meets the Department's requirements. The EIA Pre-Screening appended to this submission is noted also, including its conclusion that no EIA or Screening for EIA is required</p>

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<p>connected with or necessary to the management of a site as a European Site, but which are likely to have a significant effect thereon, either individually or in combination with other plans or projects. An AA Screening assessment is carried out to determine whether a plan or project is likely to have a significant effect on a European Site.</p> <ul style="list-style-type: none"> Article 6.3 states that: <i>“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.”</i> Article 6.4 states: <i>“if, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.</i> <p><i>Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.”</i></p> <p>In giving effect to the above as a matter of Irish law, the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended) (Birds and Natural Habitats Regulations) provide as follows:-</p> <p>Regulation 42(1) of the Birds and Natural Habitats Regulations states that: <i>“A screening for Appropriate Assessment of a plan or project for which an application</i></p>	

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<p><i>for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site”.</i></p> <p>Regulation 42(2) provides that: “A public authority shall carry out screening for Appropriate Assessment under paragraph (1) before consenting for a plan or project is given, or a decision to undertake or adopt a plan or project is taken”.</p> <p>The Birds and Natural Habitats Regulations further provide as follows at Regulation 42 (6) and 42 (7):-</p> <p><i>6. The public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.</i></p> <p><i>7. The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.</i></p> <p>Furthermore, under section 42A (13) of S.I. No. 293 of 2021 an Appropriate Assessment, including the specified public consultation, must be carried out before the public authority makes a decision to undertake or adopt the proposed plan or project.</p> <p>Risk Assessment for Annex IV Species Outside of designated Natura 2000 sites, the waters around Ireland’s coast are a suitable habitat for a number of species listed under Annex IV of the Habitats</p>	

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<p>Directive (92/43/EEC). Article 12 of the Habitats Directive affords strict protection to those species listed in Annex IV of the Directive wherever they occur. Where necessary a Risk Assessment for adverse effects of the proposed works on Annex IV species must be undertaken and a report produced. This assessment is separate to that undertaken under Article 6.3.</p> <p>The purpose of the Risk Assessment is to examine the possibility that the proposed project either individually or in combination with other plans and projects, may result in the deliberate disturbance or destruction of any of the species listed in Annex IV which may be present in the works area. The Risk Assessment should take into account the status (e.g. as indicated in the latest Article 17 reporting for Ireland, NPWS 2019) and sensitivities of relevant Annex IV species to potential impacts associated with the proposed project.</p> <p>The Risk Assessment for Annex IV Species should be precise, with definite findings, mitigation and conclusions removing all reasonable scientific doubt as to the effects of the proposed project on any Annex IV species.</p> <p>EIA Directive</p> <p>In Ireland, in accordance with Directive 2011/92/EU, as amended by Directive 2014/52/EU (hereafter, the EIA Directive), projects that are likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location must be subject to an EIA.</p> <p>Article 4 of the EIA Directive requires that projects listed under Annex I must always have an EIA while projects listed under Annex II shall be subject to an EIA if (i) determined on a case-by-case basis or (ii) they exceed certain thresholds set by each Member State. Thresholds have been set for Annex II projects in Irish legislation. Projects which do not meet the threshold may still require an EIA if the project is likely to have significant effects on the environment. Annex I and Annex II projects have been transposed into Section 5 (Parts 1 and 2) of the Planning and Development Regulations 2001, as amended.</p> <p>Section 13A(1)(b)(i) of The Foreshore Act 1933, as amended, requires that an EIA be carried out for all developments of a class specified in Part 1 or Part 2 of Schedule 5 of the Planning and Development Regulations where the</p>	

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<p>development exceeds the relevant quantity, area or other limit specified in that Part, or where no quantity, area or other limit is specified. Section 13A(1)(b)(ii) of the Foreshore Act states that an EIA shall be carried out when a development is of a class specified in Part 2 of Schedule 5, but does not exceed the relevant threshold (i.e. sub-threshold) and the Minister determines that the proposed development would be likely to have significant effects on the environment. Therefore, it is necessary to examine such projects on a case-by case basis.</p> <p>In the case of Annex II projects that are determined on a case-by-case basis, or sub-threshold, an EIA screening is required to determine if the project will have significant effects on the environment. Under Article 4(4) the developer (applicant) is required to submit information on the characteristics of the project and its likely significant effects on the environment. The developer may also provide a description of any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment. Subsequently, in accordance with Article 4(5), the Minister is required to make a determination, which shall be made public, that:</p> <ol style="list-style-type: none"> 1. Where it is decided that an EIA is required, states the main reasons for requiring such assessment with reference to the relevant criteria listed in Annex III (Schedule 7 of the Planning & Development Regulations 2001) of the EIA Directive; or 2. Where it is decided that an EIA is not required, states the main reasons for not requiring such assessment with reference to the relevant criteria listed in Annex III of the EIA Directive, and, where proposed by the developer, states any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment. 3. Annex II 2a of the EIA Directive lists deep drilling projects which may be subject to an EIA however it states that drillings for investigating the stability of the soil is an exception to this. The drilling of bores holes falls into this category and so does not require an EIA. 4. Therefore the proposed development is not of a type/class that is included in Annex I and II of the EIA Directive (Schedule 5 to the Planning & Development Regulations). However an EIA Pre-Screening process is a requirement to demonstrate this analysis. Accordingly, please find attached an EIA Pre-Screening for the proposed project. 	

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<p>Non-statutory Environmental Report Where projects do not fall under a class that require an EIA or an EIA Screening, and in- keeping with good governance, a Non-statutory Environmental Report assessing the environmental effects of the proposed works on the receiving environment is required. This report will document the current state of the environment in the vicinity of the proposed activity in order to quantify the effects, if any on the environment, and if applicable to highlight how mitigation will be implemented to minimise impacts on the environment. The EPA Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports (2017) indicates the relevant topics to be covered in this report.</p> <p>Independent Environmental Consultants (IEC) Owing to the scale and complexity of the environmental assessment required, and taking account of the available resources within the Department, the Marine Advisor recommends that Foreshore Section of DHLGH engage a suitable qualified IEC. The IEC must conduct an independent assessment of the information provided by the Applicant, having regard to the Habitats Directive, the Birds Directive, the Birds and Natural Habitats Regulations, the EIA Directive, Non-statutory Environmental Reports and relevant jurisprudence of the EU and Irish courts.</p> <p>The IEC shall ensure that The Minister has all the environmental assessments required to allow them to make decisions on applications under The Foreshore Act 1933, as amended in accordance with the requirements set out in Directive 92/43/EEC (Habitats Directive), Directive 2009/147/EC (Birds Directive) and Directive 2011/92/EU, as amended by Directive 2014/52/EU (EIA Directive).</p> <p>In principle the Marine Advisor has no objections to this application. As outlined above, the marine advisor recommends that Foreshore Section of DHLGH engage a suitable qualified IEC. A Screening for an Environmental Impact Assessment will be required from the applicant and the assessment of this project is of a scale and nature that it can be undertaken with the Foreshore Unit.</p> <p>On completion of the Public and Prescribed Bodies Consultation and the work of the IEC, the Marine Advisor will furnish their AA Screening Determination and</p>	

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<p>Environmental Report. If the Minister adopts and approves these reports and a determination is made that a Stage 2 Appropriate Assessment is required n public consultation will be held on the AA. The Final Environmental Report with Determinations (if an EIAR Reasoned Conclusions should be address here) which may include any case specific conditions identified through the environmental assessments will follow having regard to the information obtained during public participation.</p>	
<p>Marine Survey Office (MSO) After careful consideration the Marine Survey Office has no objection to the above referenced application from a navigational safety perspective.</p> <p>However, MSO state that the following points shall be of note:</p> <ol style="list-style-type: none"> 1. The Licensee shall, through consultation and agreement with the Department of Transport, Marine Survey Office and Commissioners of Irish Lights, arrange for the publication of a Marine Notice through the Maritime Safety Policy Division. The frequency of Navtext and radio breakfast warnings to be agreed in advance with the Irish Coast Guard. 2. Marking and lighting of moored instruments if required shall be carried out in consultation with the Marine Survey Office and Commissioners of Irish Lights. Lighting and marking shall be compliant with International Association of Aids to Navigation (IALA) requirements. Information regarding the position of any markings which create a hazard to navigation shall be promulgated to the mariner via publication of a marine notice. 3. The Licensee shall ensure all appropriate measures are taken for the duration of any on-site activity to ensure the safety of navigation is maintained. Any hazard to safe navigation shall be easily identifiable to all mariners operating within or in the vicinity of the licence area. 	<p>The applicant welcomes the observations of the Marine Survey Office stating "<i>Marine Survey Office has no objection to the above referenced application from a navigational safety perspective.</i>"</p> <p>The applicant has no objection to the proposed conditions, as recommended by the Marine Survey Office being included as site-specific conditions to the licence.</p>
<p>Marine Institute The Marine Institute (MI) acknowledge that the overall aim of the site investigations is to collect where necessary data and information required to optimise the layout and design of an offshore windfarm (circa 1000MW) in the area, and to acquire baseline data on the wind resource and baseline environmental information in the area. MI confirm that the possible installation of a</p>	<p>The Applicant welcomes the observations of the Marine Institute stating, "<i>the Marine Institute is satisfied that the site investigations as proposed will not have a significant impact on the marine environment in the survey area and will not have a significant impact on other legitimate uses / users of the area and therefore has no objections to a licence being granted.</i>"</p>

Screening for Appropriate Assessment

Statutory Body	Applicant's Response
<p>windfarm and associated infrastructure in the area is subject to a separate Foreshore Lease / Licence application and is not the subject of this current application.</p> <p>MI state that there are three licenced aquaculture sites in Ballymacoda Bay, one of which is intersected by the proposed Foreshore licence area. Notwithstanding, given the proposed sampling methodologies (assuming a jack-up barge is not located over the footprint of the licenced sites), impacts on aquaculture are not considered likely by MI.</p> <p>There is commercial fishing activity within the proposed site investigation area on the Foreshore and therefore some interaction with fishing activity may occur. It is considered by MI that that such interaction will be limited and overall will not be significant. It is noted by MI that the applicant proposes to appoint a Fisheries Liaison Officer and it is recommended by MI that the appointment of the Fisheries Liaison Officer should be a specific condition on any licence that may be granted.</p> <p>The Marine Institute advises that the licencing body consider the cumulative effects on species (marine mammals and birds, in particular) that these activities may have with other similar activities likely to occur in the vicinity. MI understand that it would be important that such surveys are carried out in a co-ordinated fashion to avoid redundancy of effort and to minimise potential disturbance.</p> <p>On the basis of the above and considering the nature, scale and location of the proposed site investigations the Marine Institute is satisfied that the site investigations as proposed will not have a significant impact on the marine environment in the survey area and will not have a significant impact on other legitimate uses / users of the area and therefore, has no objections to a licence being granted. It is recommended by MI that the following specific conditions should be attached to any licence that may issue.</p> <ol style="list-style-type: none">1. The Licensee shall use that part of the Foreshore the subject matter of this licence for the purposes as outlined in the application and for no other purposes whatsoever.	<p>The Applicant has no objection to the proposed conditions, as recommended by the Marine Institute being included as site-specific conditions to the licence.</p> <p>The Applicant wishes to note that Inis Ealga Marine Energy Park Ltd. is currently engaged in consultation with local fishers regarding the proposed site investigations and that a Fisheries Liaison Officer has been appointed to Inis Ealga Marine Energy Park since 2020. Inis Ealga Marine Energy Park Ltd. has commenced engagement with the fishing community both through the Fisheries Liaison Officer appointed and via DP Energy's Community & Stakeholder Liaison Manager also appointed to the project since 2020.</p>

Screening for Appropriate Assessment

Statutory Body	Applicant's Response
<p>2. The Licensee shall ensure that the works are carried out and completed in accordance with the plans and particulars lodged with the application.</p> <p>3. The Licensee shall appoint a Fisheries Liaison Officer who will consult with the SFPA and relevant fishermen's groups in order that appropriate actions can be taken to avoid or minimise interactions with ongoing fishing activity in the area during the course of the site investigations.</p> <p>4. The Licensee shall ensure that all precautions and mitigation measures set out in the Scope of Works and Environmental Supporting Information documents are implemented in full.</p>	
<p>Department of Agriculture, Food and the Marine (DAFM) DAFM requests that the following conditions be included in any licence that is issued:-</p> <ul style="list-style-type: none"> • It is noted by the Marine Institute, that the applicant proposed to appoint a Fisheries Liaison Officer and it is recommended that the appointment of the Fisheries Liaison Officer should be a specific condition on any licence that may be granted; • Marine Engineering Division note the applicant has stated that a Fishery Liaison Officer has been appointed. This Officer should fully engage with the Licenced Sites' Operator(s) in advance of any planned works within the area, and also during the proposed works and a review of activities after works are completed. 	<p>Inis Ealga Marine Energy Park Ltd. acknowledges the two conditions recommended by the Department of Agriculture, Food, and the Marine for inclusion in any Foreshore License issued to the project. These relate to engagement of a Fisheries Liaison Office and ensuring that the Fisheries Liaison Officer engages with the survey contractors in advance of, during and following the proposed site investigations. A Fisheries Liaison Officer has and will continue to be engaged by the project. We have no objection to the proposed conditions, as recommended by the Department of Agriculture, Food, and the Marine, being included as site-specific conditions to the licence.</p>

Table 1.2: Summary of Observations made by the Public and the Applicant’s Response

Public Submissions	Applicant’s Response
<p>Submission 1 The observer would like to object to the windfarm at Ballycotton - Inis Ealga Marine Energy Park (Ref. No FS 007404) as they make their living from Hook Head to Cork Harbour. The observer has an under 10m trawler and works in the area of the proposed wind farm. The observer states that if the proposed wind farms go ahead they will lose their lively hood, as their boat is too small to work outside the area in the deep water.</p>	<p>The application for Foreshore License pertains only to proposed site investigation activities, which are temporary and short term in nature. The submission above references potential impacts on fishing activities due to the presence of a wind farm, which is not pertinent to this application for Foreshore License which proposes site investigations-only. It is acknowledged that a degree of temporary displacement of fishing activity may result during some of the proposed site investigations, particularly during towing of equipment, and Inis Ealga Marine Energy Park Ltd. is committed to engaging with the fishing community to minimise disturbance as far as possible and to discuss any potential impacts in an open manner. Inis Ealga Marine Energy Park Ltd. will give timely notice before commencement of survey works through the publication of marine notices and through its ongoing engagement with fishers and fisheries organisations.</p>
<p>Submission 2 The observers wish to make the following joint submission:</p> <p>The observers acknowledge that the applicant has consulted with the fishing industry, which has included some of the observers’ members. The observers would always advocate that applicants consult directly with operators likely to be directly affected on such projects and commend the applicant on their efforts in this regard to date. The observers look forward to future engagement between the developer and their members. That said however the observers have members that have raised, what they feel are valid concerns regarding this application. This submission is based on the same, the main points being as follows.</p> <p>Importance of area to Inshore Fishing Activity The observers state that the area in question is important in general to Inshore Commercial fishing, particularly static gear fishing using pots targeting lobster, brown, velvet and green crab but in particular Shrimp during the regulated season of August 1st to March 15th. The Shrimp fishery accounts for a significant portion of these members annual income and is confined geographically to this area. The area is also important to the observers members for static netting for a mixture of</p>	<p>Importance of area to Inshore Fishing Activity The proposed site investigations will be short in duration, and the area of foreshore occupied by survey vessels will be limited.</p> <p>Inis Ealga Marine Energy Park Ltd. has commenced engagement with the fishing community both through the Fisheries Liaison Officer appointed to the project since 2020 and via DP Energy’s Community & Stakeholder Liaison Manager appointed to the project since 2020. We acknowledge that there is potential for some disruption to the fishers. Information such as seasonality of the fishery can inform the survey timing and area to minimise disruption to the fishers.</p> <p>Potential effects on fish species due to the proposed site investigations are appraised in Section 2.3 of the document submitted in support of this application for Foreshore License as ‘Environmental Supporting Information’. Potential effects on Commercial Fisheries due to the proposed site investigations are appraised in Section 2.6 of that same ‘Environmental Supporting Information’ document.</p>

Public Submissions	Applicant's Response
<p>species. Is it of particular important to their members based in Youghal Co. Cork and they have a longstanding traditional economic dependency on it.</p> <p>Members concerned operate small vessels, typically between six and ten metres in length, given the size of these vessels and the nature of fishing activity in the broader general area, operating elsewhere, to where they traditionally have done, the observer states that it is not realistically a viable option for them, even on a short term basis.</p> <p>Likely short-term disruption of activity and economic impact caused by the same</p> <p>While the observers appreciate this application is for site investigation works, their members are concerned that these works will disrupt their fishing operations and this disruption will have a negative economic impact on them. The extent of that disturbance is still unknown and will likely vary between members. Given the density of fishing activity, both in this specific and adjacent areas and the nature of the survey work, disruption is highly likely, and may involve static gear operators having to move gear, to avoid damage or loss to it, in advance of the survey. Previous experience with similar applications has proved this to be the case.</p> <p>The observers' position is that any disruption should be kept to an absolute minimum. Given that avoiding this disruption completely is highly unlikely and given the principles of "avoid, minimise or mitigate" detailed in the National Marine Planning Framework (NMPF), we ask that consent to proceed be withheld until a Fisheries Management and Mitigation Strategy (FMMS) is agreed with our relevant members. This FMMS must endeavour to avoid disturbance during the Shrimp Season as it contributes significantly to the annual incomes of these members. This FMMS needs to be designed to keep displacement of activity to an absolute minimum but where displacement occurs and in turn has a negative impact on members working outside of the area, the FMMS and agreement needs to take these members into account also.</p> <p>Medium to long term economic impact</p> <p>The observers state that again, acknowledging that the application is for site investigation works, members have concerns that these works will have a</p>	<p>Likely short-term disruption of activity and economic impact caused by the same</p> <p>Inis Ealga Marine Energy Park Ltd. recognises the potential for disruption to the fishers within the survey area and agree that any disruption will be kept to a minimum. For disruption to be kept to a minimum, it is essential that correct and accurate information is obtained regarding fishing area and seasonality.</p> <p>Inis Ealga Marine Energy Park Ltd. has commenced engagement with the fishing community both through the Fisheries Liaison Officer appointed to the project since 2020 and via DP Energy's Community & Stakeholder Liaison Manager appointed to the project since 2020. Engagement with all those with economic interests (including fishing, tourism and other) will be a key part of this ongoing stakeholder engagement. To this end, an additional resource has been appointed to the project since 2021: a Community Liaison Officer.</p> <p>This application for Foreshore License pertains only to site investigation activities which are temporary and short-term in nature and will not result in significant economic impact.</p> <p>Medium to long term economic impact</p> <p>Inis Ealga Marine Energy Park Ltd. recognises the potential for impacts of any future wind farm development on the economy (whether positive or negative) and will undertake a detailed appraisal of any potential impacts of Inis Ealga Marine Energy Park on socioeconomics, including on the fishing industry. This appraisal of potential impacts will be set out within the Environmental Impact Assessment Report to be submitted to An Bord Pleanála in support of any eventual Development Consent application for an offshore wind farm.</p> <p>To address specific concerns, and recognising the importance of the fishing industry to coastal communities and the economy as a whole, Inis Ealga Marine Energy Park Ltd. has appointed a specialist Fisheries Liaison Officer (FLO) (John Harrington) to work closely with</p>

Public Submissions	Applicant's Response
<p>negative effect that will be longer lasting than the duration of works. These concerns are based on previous experience for similar site investigation works associated with the Eirgrid Celtic Interconnect project. Members inform that shrimp fishing was exceptionally poor for over a month following those works. The observers note that the above mentioned FMMS needs to take these concerns into account also.</p> <p>Finally, to conclude, the observers would like to thank DHLGH for the opportunity to make this submission and trust that their concerns will be given the consideration they deserve.</p>	<p>the fishing community, and with DP Energy's Community & Stakeholder Liaison Manager, in assisting with the early engagement process and to provide technical feedback on fisheries concerns raised.</p> <p>Inis Ealga Marine Energy Park Ltd. is currently collating and assessing the concerns raised by the members of fishing industry during ongoing engagement and will produce a policy concerning survey zoning and mitigation methods for the proposed site investigations.</p>
<p>Submission 3 This submission is the same as submission 2.</p>	<p>Please see response to submission 2.</p>
<p>Submission 4 The observer is making this response as a person directly dependent on a Commercial Inshore Fishing Enterprise, and is concerned the project outlined will impact negatively on this enterprise.</p> <p>The observer acknowledges that this application is for site investigation works, but is concerned that these works will negatively affect the financial viability of the fishing enterprise they depend on, and their livelihood. The observer is also concerned about displacement of fishing activity as a result in the wider area and the negative impact this will have on this enterprise.</p> <p>In the event that it's not possible to avoid this negative impact then the observer asks that consent be withheld for the proposed activity until a Fisheries Management and Mitigation Strategy is agreed between the observer and the applicant.</p> <p>The fishing operation the observer is dependent on, operates in the following areas, at the following times, for the following species, fishing by means of the following methods, and the observer fears the proposed works will prevent or disrupt it from doing the same.</p> <ul style="list-style-type: none"> Operating in the area roughly bound by the following latitude and longitude coordinates. My vessel operates within the area between 	<p>To address specific concerns, including those set out in Submission 4, and recognising the importance of the fishing industry to coastal communities and the economy as a whole, Inis Ealga Marine Energy Park Ltd. has appointed a specialist Fisheries Liaison Officer (FLO, John Harrington) to work closely with the fishing community, and with DP Energy's Community & Stakeholder Liaison Manager, in ensuring early engagement and to provide technical feedback on fisheries concerns raised.</p> <p>Inis Ealga Marine Energy Park Ltd. is currently collating and assessing the concerns raised by the members of fishing industry during ongoing engagement and will produce a policy concerning survey zoning and mitigation methods for the proposed site investigations.</p> <p>Potential effects on fish species due to the proposed site investigations are appraised in Section 2.3 of the document submitted in support of this application for Foreshore License as 'Environmental Supporting Information'. Potential effects on Commercial Fisheries due to the proposed site investigations are appraised in Section 2.6 of that same 'Environmental Supporting Information' document.</p>

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Public Submissions	Applicant's Response
<p>Ballycotton in the West and Helvick in the East and out to sea. The area I am most concerned with is bounded by the following area (51 53.00N 007 49.20W, 51 53.00N 7 48.0W, 51 54.70n 7 49.50W, 51 54.70N 7 48.50W, 51 51.40N 007 48.15W & 5151.60N 007 47.20W). The positions supplied are for the observer's crucial Shrimp fishery Aug to March annually.</p> <ul style="list-style-type: none"> • The fishing operation the observer is dependent on, traditionally fishes for crustacean, shellfish, whitefish, all year round. Commerical fishing is my only source of income. By means of pots/other. • Operating in the area roughly bound by the following latitude and longitude coordinates (as previously stated from Ballycotton to Helvick out to sea and a very important Shrimp fishery in Youghal Bay. • The fishing operation the observer is dependent on, traditionally fishes for crustacean shellfish/ bi valve mollusc/whitefish/other species during the previously statement months by means of pots/static nets/demersal trawl/mid water trawl/bottom dredge/hooks and lines/other. <p>Outside of the specific areas in which this enterprise fishes, it is reliant on other areas covered by the application for safe navigational passage to and from the fishing grounds to the following safe harbours on a 24/7/365 basis.</p> <p>The observer would also like to raise the following points:</p> <ul style="list-style-type: none"> • The observer's fears are that any works carried out in and around their mentioned shrimp fishery (Map Supplied) will negatively impact their ability to catch the single most valuable target species (shrimp) in the Youghal bay area which is totally within the applicants designated cable corridor. The observer's feeling is that knowing the ground the constantly shifting sediments would not make this area suitable for cable burial should the applicant be successful in all stages and progress past the planning stage. The observer's position is that they totally object to this scope of proposed works, no mitigations could convince them that survey works will not damage the fishery in the area which will potentially put them and their family out of business. 	

1.4 Legislative context

The *Foreshore Act 1933* (as amended), requires that a lease or licence must be obtained from the Minister for Housing, Local Government and Heritage for the carrying out of works or placing structures or material on, or for the occupation of or removal of material from, State-owned foreshore.

The 1992 EU Habitats Directive (Council Directive 92/43/EC) and Birds Directive (2009/147/EC) are transposed into Irish law by Part XAB of the *Planning and Development Act 2000* (as amended) and the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended). The latter outlines the requirements for screening for AA and AA under Regulation 42:

42. (1) A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.

(2) A public authority shall carry out a screening for Appropriate Assessment under paragraph (1) before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.

(6) The public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.

Relevant guidance informing the AA screening includes that at a European (European Commission 2019, European Commission 2021) and national (DoEHLG 2010, Office of the Planning Regulator 2021) level.

SECTION 2 - DESCRIPTION OF PROPOSED WORKS

2.1 Location

The Foreshore Licence application area (FLAA) lies within Ireland's 12 nautical mile limit, in the Celtic Sea off the coast of County Cork. The Foreshore Licence application area extends in a southerly direction along the shore, from approximately 2km southwest of the town of Youghal, County Cork, towards Knockadoon Head and Capel Island, and in a southeasterly direction towards the open sea. Figure 2.1 shows the Foreshore Licence application area, delineated by a red line, encompassing an area of 6,492 hectares (ha).

It is proposed that geophysical and geotechnical surveys, ecological monitoring, underwater archaeological surveys and wind resource and metocean surveys will be carried out. The indicative locations of the geotechnical and ecological sampling, and the proposed cable corridor and cable routes are shown in Figure 2.2.

2.2 Proposed Site Investigations

The site investigation will include:

- Geophysical survey;
- Geotechnical survey;
- Wind resource and metocean surveys;
- Archaeological survey;
- Benthic ecology and intertidal survey; and
- Bird and marine mammal surveys.

Figure 2.1: Foreshore Licence Application Area (Source: Annex C - EIA Screening and Environmental Report, Ch 1, pg. 8)

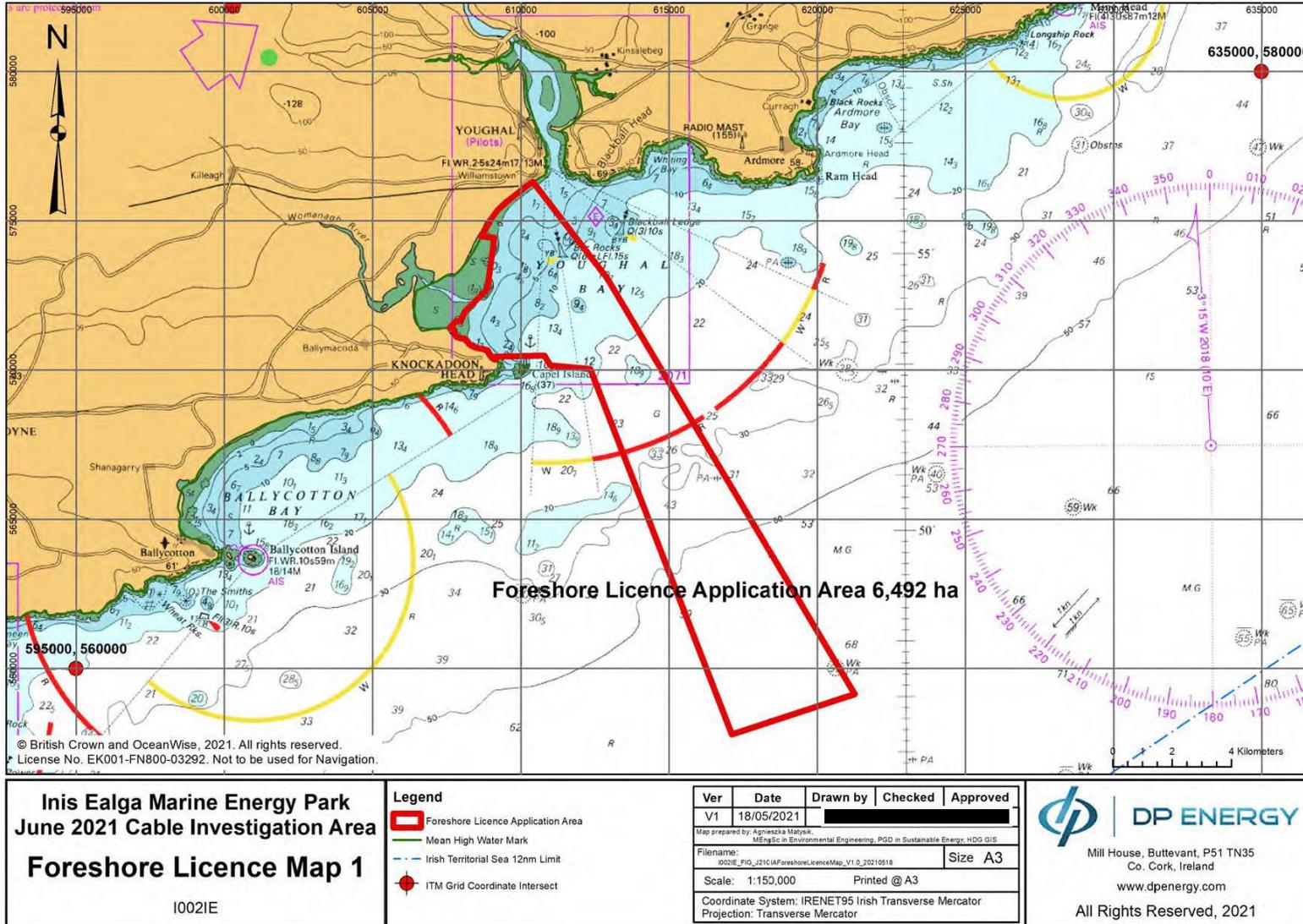
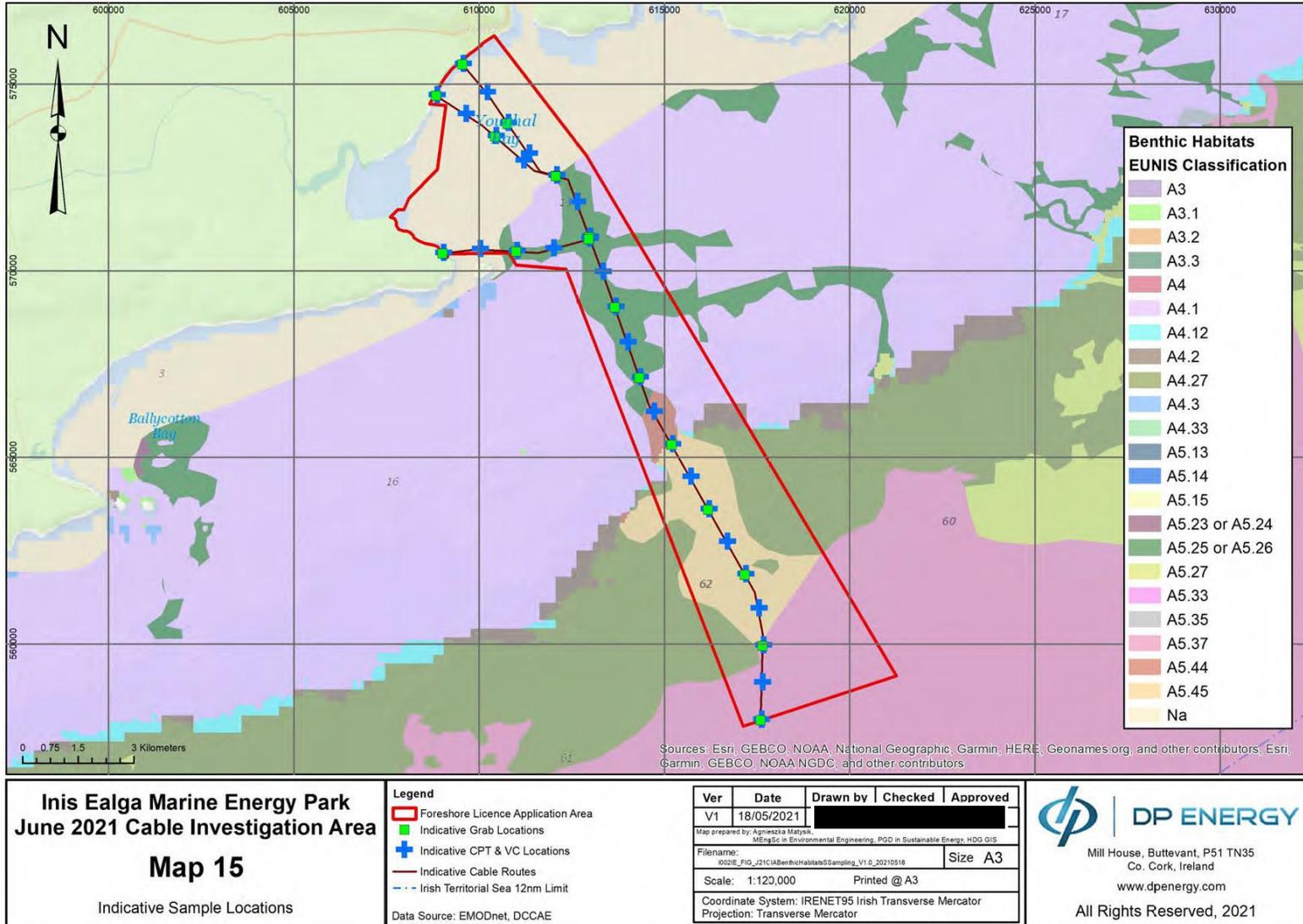


Figure 2.2: Cable Investigation Area (Source: Annex C - EIA Screening and Environmental Report, Ch 2.5, pg. 15)



2.3 Survey Summary

Table 2.1 provides information on each of the elements of the works and an indication of the survey duration. The indicative survey locations are shown in Figure 2.2 above.

Table 2.1: Summary of surveys and indicative programme

Activity	Geographical Scope	Survey Requirements	Vessel Size	Indicative Timings
Geophysical Surveys	Exact location within the Foreshore Licence application area is to be determined; possibly conducted along an approximately 500m-wide corridor along each potential export cable route.	<ul style="list-style-type: none"> Multibeam echosounder (MBES): Potential equipment suppliers include: Kongsberg and Teledyne RESON. Side scan sonar (SSS): The side scan sonar will be a dual frequency hydrographic sonar with a lowest operating frequency of not less than 100 kHz. The higher frequency of the side scan sonar will be between 410 and 500 kHz Sub-bottom profiling (SBP): will likely require two different systems: a high-resolution profiler with 0.25m resolution or better, and a system that provides increased penetration between 50m and 100m. “Pinger”, “boomer” and “chirp” systems will be applied as appropriate for seabed conditions. Frequency will be 0.5-300Hz. Magnetometer survey: caesium vapour type with accuracy of $\pm 0.5nT$. <p>(Note 1)</p>	Geophysical survey vessels are typically between 15m and 60m in length with an endurance of up to 14 days.	Spring/Summer 2022 3-month window nominally mid-April to mid-July (including archaeology and benthic surveys) in association with the benthic sampling programme
Geotechnical Survey (Note 2)	Exact location within the Foreshore Licence application area to be	Approximately 30 no. vibrocores, typically 150mm diameter; up to 6m in depth. 30 no. samples, volume of each approximately 0.12m ³ .	Geotechnical survey vessels are typically between 55m and	Preliminary survey: 2-month window in Year 2 or 3,

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Activity	Geographical Scope	Survey Requirements	Vessel Size	Indicative Timings
	<p>determined. Once the geophysical data has been analysed, the geotechnical sampling will be restricted to the potential footprint of the development including export cable corridors.</p> <p>Indicative locations are shown in Figure 2.2</p>	<p>It has been assumed that a vibrocore will be deployed every 1 km along a preferred cable route.</p> <p>Approximately 30 no. cone penetration tests (CPT) on a deck-mounted CPT, of yet unknown diameter, up to 40m depth.</p> <p>It has been assumed that a CPT will be deployed every 1 km along a preferred cable route.</p> <p>No sediment will be removed from the seabed.</p> <p>Approximately 2 no. boreholes at the chosen cable landfall, 112mm diameter, creating a seabed footprint up to 143mm diameter, up to 25m depth. Sample volumes approximately 0.25m³.</p>	<p>90m in length with an endurance of up to 28 days at sea.</p> <p>Boreholes are typically drilled from a jack-up barge (JUB) using a percussion and a rotary corer. The number of legs used by the JUB is dependent on seabed conditions, current strength, and wave action. For this FLAA, four legs is the most likely scenario for the JUB. Each leg typically has a seabed footprint of approximately 2.54m².</p>	<p>nominally August to September</p> <p>Main survey: 4-month window in Year 4 Spring/Summer.</p>
Wind Resource and Metocean Surveys	Exact location to be determined	Deployment of approximately two acoustic doppler current profilers (ADCP) via a vessel on-	Not specified	Summer Year 1 for minimum of 12 months and

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Activity	Geographical Scope	Survey Requirements	Vessel Size	Indicative Timings
		board crane and approximately two Waverider buoys.		maximum of 36 months (wind resource). 6-month period starting in summer Year 1 (metocean)
Archaeological Survey	Exact location to be determined	A desktop study will be undertaken to inform the approach to assessment of cultural heritage features. Offshore magnetometer surveys may also be undertaken to identify any additional cultural heritage features.	Not specified	3-month window (nominally mid-April to mid-July)
Benthic Ecology and Intertidal Surveys	Within the boundary of the Foreshore Licence application area, along the potential cable export routes, exact location to be determined. Indicative location outlined in Figure 3.2.	Approximately 30 no. grab stations with 3 no. samples at each (90 total) using grab sampler launched from vessel crane or A-frame; two samples for faunal analysis and one for sediment and chemical analysis. Day or Hamon grab sampler will be used. Single sample volume 0.1m ³ , greater than 5cm depth. Total sample volume will be 9m ³ .	Not specified	3-month window (nominally mid-April to mid-July), Year 2
	Exact location to be determined. Refer to Figure 3.2 for indicative locations	Drop-down camera (DDC) and video transects (VT), non-intrusive. A minimum of four still photographs will be acquired at each environmental sampling station. Additional photographs or video footage will be acquired along transects to characterise sensitive habitats or features.	Not specified	
	Exact location to be determined, assumed survey could take place at any landfall area in the	Intertidal floral and faunal surveys at proposed cable landfall locations to include transects, quadrats and core sampling	Not applicable	

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Activity	Geographical Scope	Survey Requirements	Vessel Size	Indicative Timings
	Foreshore Licence application area			
Bird & Marine Mammal Survey	Location will depend on the outcome of Year 1 of aerial surveys underway for Bird & Marine Mammals	Survey data to supplement the 24-month aerial bird and marine mammal survey effort already underway. May require deployment of Passive Acoustic Monitors, Static Acoustic Monitors, or to carry out boat-based bird and marine mammal surveys	Not specified	Year 2, seasonal

Notes :

1. *The swath width for each piece of equipment will depend on water depth encountered. It is anticipated that the width of each swath will allow for a 50% overlap between each swath.*
2. *The exact location, quantity, type, and penetration of the geotechnical samples will be determined following interpretation of the data arising from the geophysical survey and depending on the evolving design of the development. Proposed geotechnical sample locations will be communicated to the National Monuments Service – Underwater Archaeology Unit for approval ahead of works commencing. Proposed locations will be accompanied by an assessment of the geophysical data by a qualified and experienced marine archaeologist.*

2.4 Review of proposed works

EC (2002, 2021) guidance indicates that a project description should identify all those elements of the project, alone or in combination with other projects or plans, that have the potential for having significant effects on the Natura 2000 site. To this end, the guidance (EC 2021) provides an indicative list of the key parameters of the plan or project to be identified.

Size (e.g. in relation to direct land-take)	Yes. The foreshore boundary of the proposed site investigations is detailed in Figure 2.1 above.
Overall affected area including the area affected by indirect impacts (e.g. noise, turbidity, vibrations)	Yes. The applicant defines the ZoI for the project with reference to a set of criteria in Appendix A2.3.2 of the Applicant's Environmental Supporting Information report, or see Section 3.3 of this report.
Physical changes in the environment (e.g. modification of riverbeds or morphology of other water bodies, changes in the density of forest cover)	Yes. The potential physical changes to the environment from the proposed site investigations are summarised in Section 3.2 of this report.
Changes in the intensity of an existing pressure (e.g. increase in noise, pollution or traffic);	Yes. The applicant notes the temporary increase in underwater noise and disturbance which may be generated by the survey activities and their related vessels.
Resource requirements (e.g. water abstraction, mineral extraction);	Yes. Table 2.1 provides information on the resource requirements of the different surveys.
Emissions (e.g. nitrogen deposition) and waste (and whether they are disposed of on land, water or in the air)	Yes. Section 3.9 of the Applicant's Environmental Supporting Information report covers waste management.
Transportation requirements (e.g. access roads)	Yes. Table 2.1 above outlines the types of vessels that would be used to undertake the survey.
Duration of construction, operation, decommissioning, etc.	Yes. See Table 2.1 above.
Temporal aspects (timing of the different stages of a plan or project)	Yes. See Table 2.1 above.
Distance from Natura 2000 sites and in particular from their designating features	Yes. See Section 3 of this report (Table 3.4).
Cumulative impacts with other projects or plans	Yes addressed in Section 3.5 of this report.

SECTION 3 - STAGE 1 SCREENING FOR APPROPRIATE ASSESSMENT

3.1 Basis for screening the project

Article 6(3) of the Habitats Directive indicates that, “Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4¹, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.” These provisions are transposed under regulation 42 of the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended).

The project, as defined in Section 2, is not directly connected with the management of a Natura 2000 site, and under the provisions of the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended), and the Competent Authority (in this case the Department of Housing, Local Government and Heritage) must therefore determine whether an Appropriate Assessment is required.

3.2 Identification of possible effects

The applicant has used the OSPAR Intercessional Correspondence Group on Cumulative Effects (ICG-C) pressure list and definitions (OSPAR 2011) to describe the potential pressures expected from the proposed site investigations. These potential pressures may be direct or indirect, temporary or permanent, beneficial or harmful to the site, or a combination of these. Potential pressures were identified as:

- Penetration and/or disturbance of the substrate
- Visual disturbance
- Underwater sound changes
- Risk of injury by collision
- Cumulative and in-combination effects

3.2.1 Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

The applicant indicated that benthic habitats have the potential to be directly affected during the geotechnical and environmental surveys from the very small removal of sediment samples; through very localised temporary smothering by the deposition of risings from the geotechnical boreholes, and through smothering by positioning of equipment on the seabed e.g. jack-up barge (JUB) legs, or concrete/steel mooring anchors.

Based on figures provided by the applicant in the Scope of Survey Works document submitted in support of the application, the geotechnical (vibrocores) and environmental grab sampling combined will remove approximately 12.6m³ of sediment from the FLAA. At the selected

¹ Article 6(4) relates to plans or projects which must be undertaken despite identification of an assessment determining a negative effect on a given site due to imperative reasons of overriding public interest (IROPI), including those of a social or economic nature. Suitable compensatory measures are required to maintain the coherence of the network should such a case be made.

landfall, the JUB legs and two boreholes will affect an area of 20.32m². Following completion of drilling, the borehole will be left to naturally backfill with sediments and cuttings material.

3.2.2 Visual disturbance

3.2.2.1 Birds

The applicant indicated that the proposed site investigations (both at the beach and in the foreshore area) may disturb birds which use the area for feeding, loafing and breeding. Responses to disturbance can result in loss of energy; impaired breeding; unrest through increased vigilance; and disruption to incubation leading to increased nest failures due to predation and nest abandonment (Valente & Fischer 2011).

The extent to which a seabird responds to disturbance is dependent upon a number of factors including: period of breeding cycle during which disturbance occurs; duration, type and intensity of the disturbance; presence of opportunistic predators; and the degree of habituation with the disturbance (Showler *et al.* 2010). It is noted that Showler *et al.* (2010) focuses on the impact of public access on foot and associated activities (i.e. dog-walking, picnicking, bird-watching, cross-country running, climbing, angling, mountain-biking and horse riding) on breeding success of ground-nesting and cliff-nesting birds. It is noted that a number of relevant sources with respect to the disturbance of seabirds offshore could also have been used (e.g. Garthe & Hüppop 2004, Fliessbach *et al.* 2019). The applicant indicates that whilst birds present on the surface waters in the vicinity of the survey vessel could be temporarily displaced from their chosen feeding/resting location, they are likely to readily move to another nearby location. Given the short duration of the operations with the vessel moving steadily forward along the survey route, any disturbance at a given location will be minimal and given the level of vessel activity in the region, disturbance is unlikely to be felt against background levels.

A number of sites in close proximity to the FLAA (e.g. Ballymacoda Bay SPA and Ballycotton Bay SPA) are designated for overwintering birds. As the survey will be conducted between April and October, there will not be a temporal overlap between the Qualifying Interest being present at the site and the proposed site investigations.

3.2.2.2 Marine mammals

Seals hauled out on land could react to the presence of vessels. In general, ships more than 1,500m away from hauled out grey or harbour seal are unlikely to evoke any reactions, between 900m and 1,500m seals could be expected to detect the presence of vessels and at closer than 900m a flight reaction could be expected (Brasseur & Reijnders 1994, cited by applicant²). This pressure would be most significant for breeding and moulting seals, hauled out on the coast and on intertidal banks.

3.2.3 Underwater sound changes

3.2.3.1 Migratory fish

The applicant indicates that high sensitivity hearing species such as clupeids (e.g. twaite shad and allis shad) have specializations of the auditory apparatus where the swim bladder and inner ear are intimately connected and are able to detect frequencies up to 3kHz; with optimum sensitivity between 300Hz-1kHz (Nedwell *et al.* 2007). However, note that Teague & Clough (2011) report that shad may be able to detect ultrasound at frequencies of up to 180kHz, with

² <https://edepot.wur.nl/307105>

a preliminary exposure trial of twaite shad eliciting significant reactions at sound frequencies of between 30 and 60kHz.

With respect to other relevant migratory fish, it is noted that the ability of salmon to respond to sound pressure is regarded as relatively poor with a narrow frequency span, a limited ability to discriminate between sounds, and a low overall sensitivity relative to other fish species (Hawkins & Johnstone 1978, Harding *et al.* 2016). A study of the hearing ability of sea lamprey reported that, consistent with fish lacking a swim bladder, sea lamprey showed a limited sensitivity to sound, with juveniles detecting tones of 50-300Hz, but not higher frequencies (Mickle *et al.* 2019). Injury threshold criteria have been suggested by Popper *et al.* (2014), with the criteria for mortality and potential injury for species lacking a swim bladder being $L_{p,pk} > 213$ dB re 1 μ Pa and for all other groups, $L_{p,pk} > 207$ dB re 1 μ Pa.

Continuous sound

It is noted that sources of background sound come from shipping, interaction of waves and currents with the seabed, seabed development and operation, fishing industry and recreational activities. Popper *et al.* (2014) identified that there is no direct evidence of permanent injury to fish species from shipping and other continuous noise. The typical behavioural response to sound might range from no change in behaviour, to a mild awareness (startle response) to larger movements of temporary displacement for the duration of the sound (Popper & Hastings 2009).

Impulsive sound

The applicant indicates a combination of multi-beam echosounder, side scan sonar and sub-bottom-profiler will be used during the geophysical survey (see Table 3.1). Most noise from the geophysical surveys is likely to be generated at frequencies greater than 1kHz, above the auditory capacity of most migratory fish (generally between 0.2Hz to 1kHz), with the exception of twaite shad. In addition, sound from survey equipment is targeted towards the seabed, meaning that effects to fish are only expected if they are within the immediate zone of ensonification below the geophysical equipment. It is expected that fish will avoid the area once the geophysical surveys have started and are extremely unlikely to move towards the sound source. Studies of penned Pacific herring identified that they showed no visible response to sonar and echosounders indicating that they are not as sensitive to the high frequency sound emitted from geophysical equipment as the low frequency sound emitted from vessel movements (Schwarz & Greer 1984). Investigations into the influence of seismic surveys on the distribution and abundance of pelagic fish (including herring) revealed insignificant short-term horizontal distribution effects (Carroll *et al.* 2017).

In light of the information that twaite shad are able to detect ultrasound at frequencies up to 180 kHz (Teague & Clough 2011, see above), and the potential overlap with frequencies produced primarily by the Multi-Beam Echo-Sounder (MBES) and Sub-Bottom Profiler (SBP) equipment, the applicant was asked to provide further consideration of the potential for LSE with respect to impulsive underwater noise and the twaite shad feature of the Blackwater River (Cork/Waterford) SAC given that twaite shad are likely to be found in coastal areas of the Foreshore Licence Application Area (FLAA) all year round, with the greatest density likely to be observed during the May-July migration which may overlap with the survey.

The applicant noted that based on the hearing capabilities of shad and the survey sound sources, the shad hearing range has the potential to overlap with the MBES, SBP and UHRS surveys (note that no details of the UHRS survey were provided by the applicant), however the mortality/injury threshold will only be exceeded within close proximity of the sound source. Popper *et al.* (2014) states the maximum distance for a lethal effect or physical injury on a fish with a swim bladder (such as twaite shad) at a SPL level of 207 dB re 1 μ Pa is 12m. The applicant indicates that for the MBES, SBP and UHRS survey work, the vessel will be transiting

slowly along survey lines and fish will also be in motion, therefore, the zone of injury will be transient, and it is unlikely that any fish will stay close to the sound source. Typical behavioural responses suggest that twaite shad will move away from the sound source (Popper *et al.* 2014, Teague & Clough 2011) and the slow vessel speed will facilitate this behavioural response. Additionally, underwater sound from the geophysical survey equipment is targeted in relatively narrow beams towards the seabed, therefore, fish are only at risk of injury if immediately within the zone of ensonification (area filled with sound) below the sound source (note further relevant consideration provided in Section 3.2.3.2 with respect to Halvorsen & Heaney (2018) and others).

Section 3.3.1.1 of the Environmental Supporting Information report concluded that both impulsive noise and continuous noise would have an insignificant effect on twaite shad due to the localised nature of the proposed site investigations, the short-term nature of the work and the behavioural response of the species.

However, given the current level of uncertainty with respect to the geophysical surveys (e.g. the proximity of survey transects with respect to the SAC, time to be spent in nearshore areas close to the SAC), the overall poor conservation status of twaite shad³ and their potential to be present within the FLAA during survey activities which may cause some degree of disturbance to the feature, and in light of the comments from IFI with respect to the timing of survey activities coinciding with twaite shad spawning period and proposed mitigation measures, it is considered that the potential for LSE cannot be excluded.

3.2.3.2 Marine mammals

Continuous sound

The estimated unweighted source level for sound from the survey vessels is approximately 184dB re 1 μ Pa @ 1m (Genesis 2011). The survey vessels will use thrusters sporadically throughout the proposed site investigations; therefore, the source level will fluctuate throughout the duration of the proposed site investigations and will only peak at approximately 184 dB re 1 μ Pa @ 1m for short periods.

The applicant's explanatory note provided further details of the potential sound sources associated with the geotechnical survey. The applicant referenced underwater noise measurements recorded from a jack-up barge (JUB) undertaking geotechnical boreholes in Swansea Bay, Wales (Willis *et al.* 2010⁴). This activity involved a percussion corer to take soft sediment samples and rotary coring for hard rock samples. Sediment varied through the site from soft muds to coarse sand. Sediments were typically 20m thick overlying sedimentary mud rock or shale. These conditions are similar to those identified in the EMODnet 2021 data within the area subject to the application for Foreshore Licence (FS006859). During soft sediment coring, in the Swansea survey, the highest sound pressure level recorded (at 23m from the JUB) was 107db re 1 μ Pa (peak) at 10Hz. For hard rock drilling the highest sound pressure level was also 107dB re 1 μ Pa (peak) at 10Hz but it was recorded at 7.5m from the JUB (Willis *et al.* 2010). Further, noise measurements during geotechnical site investigations involving shallow core drilling to 16-17m in sand and mudstone, recorded source levels of 142–145 dB re 1 μ Pa rms @ 1 m (30–2000 Hz) (Erbe & McPherson 2017).

The explanatory note indicates that frequencies at which the peak sound pressure levels of the proposed vibrocore surveys are within the audible bandwidth for low-frequency cetaceans. Whilst not provided by the applicant, sound pressure levels generated by vibrocore equipment

³ https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf

⁴ https://www.icoe-conference.com/publication/noise_associated_with_small_scale_drilling_operations/

would be approximately 187.4 dB re 1 mPa@1m at a frequency of 30Hz (LGL 2010, cited by Codling Wind Park 2020⁵). As the frequency is outside of the auditory bandwidth for mid-frequency cetaceans, high frequency cetaceans and pinnipeds, there is unlikely to be a significant impact from continuous noise to these species. Southall *et al.* (2019) determined that the SEL (24 hr weighted) for continuous noise to cause a Temporary Threshold Shift (TTS) in low-frequency cetaceans was 178dB re 1 μ Pa-2s or 199dB re 1 μ Pa-2s for a Permanent Threshold Shift (PTS). Vibrocores will only be used for short durations, typically around 10 minutes until the vibrocore is submerged and a sample can be taken.

Of the Annex II species likely to occur in the area, the harbour porpoise (very high-frequency hearing group) has the lowest threshold criteria for the onset of permanent threshold shift (PTS) from non-impulsive sounds (Table 3.1). However, the primarily low frequency sound produced by large vessels (<200Hz) is likely below the hearing range of porpoises. The estimated sound level exceeds the threshold for the onset of a temporary threshold shift (TTS) for all the hearing groups (Table 3.1), indicating the potential for temporary auditory injury. However, the likelihood of potential injury was assessed by the applicant as low and only in close proximity (<10m) to the vessels.

Reported responses of marine mammals to the presence and movement of vessels include avoidance, interrupted foraging behaviour, changes in swimming speed, direction and surfacing patterns, and alteration of the intensity and frequency of calls (review in Erbe *et al.* 2019). Chronic exposure has also been linked to an increase in stress-related hormones (Rolland *et al.* 2012). Harbour porpoises, white-sided dolphins and minke whales have been shown to respond to survey vessels by moving away from them, while white-beaked dolphins have shown attraction (Palka & Hammond 2001). A study on captive harbour porpoises in a semi-natural net-pen complex in a Danish canal, recorded their behaviour while simultaneously measuring underwater noise of vessels passing the enclosure; reaction to noise was defined to occur when a highly stereotyped 'porpoising' behaviour was observed. Porpoising occurred in response to almost 30% of vessel passages; the most likely behavioural trigger were medium- to high- frequency components (0.25–63kHz octave bands) of vessel noise, while low- frequency components of vessel noise and additional pulses from echo-sounders could not explain the results (Dyndo *et al.* 2015). A tagging study of a small number of free-ranging porpoises in Danish coastal waters estimated that porpoises encountered vessel noise 17-89% of the time (from evaluation of the wideband sound and movement tag recordings). Occasional high-noise levels (coinciding with a fast ferry) were associated with vigorous fluking, bottom diving, interrupted foraging and even cessation of echolocation, leading to significantly fewer prey capture attempts at received levels greater than 96dB re 1 mPa (16 kHz third-octave, Wisniewska *et al.* 2018).

More evidence is available on bottlenose dolphins, especially for coastal populations. Shore-based monitoring of the effects of boat activity on the behaviour of bottlenose dolphins off the US South Carolina coast, indicated that slow moving, large vessels, like ships or ferries, appeared to cause little to no obvious response in bottlenose dolphin groups (Mattson *et al.* 2005). Pirotta *et al.* (2015) used passive acoustic techniques to quantify how boat disturbance affected bottlenose dolphin foraging activity in the inner Moray Firth. The presence of moving motorised boats appeared to affect bottlenose dolphin buzzing activity (foraging vocalisations), with boat passages corresponding to a reduction by almost half in the probability of recording a buzz. The boat effect was limited to the time where a boat was physically present in the sampled area and visual observations indicated that the effect increased for increasing numbers of boats in the area. Dolphins appeared to temporarily interrupt their activity when disturbed, staying in the area and quickly resuming foraging as the boat moved away.

⁵ <https://assets.gov.ie/79880/2f4d3487-a3ea-4682-96d5-b703871bbd11.pdf>

The proposed site investigations should be considered in the context of the existing baseline sound environment. Shipping density within the FLAA is low, but there is high coastal shipping density in the surrounding coastal region suggesting that marine mammals in the area will be habituated to higher levels of underwater sound. The change in underwater sound caused by the addition of the survey vessels, vibrocores and borehole drilling for the proposed site investigations will not be noticeable above natural and anthropogenic noise in the region.

Impulsive sound

The applicant notes that geophysical survey will produce either a discrete pulse or a series of pulses. Impulsive sounds are generally transient and brief, but in the case of geophysical surveys could also be near continuous where the repetition of pulses is considered a series of multiple discrete acoustic events within a 24-hour period.

High intensity noises can cause temporary or permanent changes to animals’ hearing if the animal is exposed to the sound in proximity and, in some extreme circumstances, can lead to the death of the animal (Richardson *et al.* 1995). Where the threshold of hearing is temporarily damaged, it is considered a temporary threshold shift (TTS), and the animal is expected to recover. If there is permanent damage (permanent threshold shift (PTS)) where the animal does not recover, social isolation and a restricted ability to locate food may occur, potentially leading to the death of the animal (Southall *et al.* 2007). Despite this, there is no direct evidence to link physical injury and geophysical survey to marine mammals, however there is evidence that marine mammals exhibit short-term behavioural responses to geophysical survey (Gordon *et al.* 2004, Stone & Tasker 2006, Southall *et al.* 2007, Thompson *et al.* 2013, Sarnocińska *et al.* 2020).

Southall *et al.* (2019) separated marine mammals into auditory groups based on their functional hearing sensitivity. The thresholds for the onset of PTS and TTS, as published in Southall *et al.* (2019), are provided in Table 3.1.

Table 3.1: Marine mammal auditory injury (PTS) and TTS onset criteria to impulsive and non-impulsive noise by functional hearing group

Functional hearing group (species relevant to the proposed development area)	Estimated hearing range (region of greatest sensitivity) [frequency of peak sensitivity]	Proposed PTS and TTS onset threshold criteria			
		Impulsive noise (dB re 1µPa, peak, unweighted)		Non-impulsive noise <i>L_{E,24h}</i> (dB re 1 µPa ² ·s)	
		PTS	TTS	PTS	TTS
High-frequency cetaceans Bottlenose dolphin (<i>Tursiops truncatus</i>)	150 Hz to 160 kHz (8.8 kHz to 110 kHz) [58 kHz]	230	224	198	178
Very high frequency cetaceans Harbour porpoise (<i>Phocoena phocoena</i>)	275Hz to 160kHz (12kHz to 140kHz) [105kHz]	202	196	173	153
Phocid seals in water Grey seal (<i>Halichoerus grypus</i>) Harbour seal (<i>Phoca vitulina</i>)	50Hz to 86kHz (1.9kHz to 30kHz) [13kHz]	218	212	201	181

Notes: The region of greatest sensitivity represents parameters f_1 and f_2 , which are the bounds of the flat, central portion of the frequency-weighting curve region; the frequency of peak sensitivity represents parameter f_0 . $L_{E,24h}$ = cumulative sound exposure level over 24 hours, weighted according to functional hearing group. Source: Southall et al. (2019).

Specific equipment details are not currently known as the contracts for the proposed site investigations have not been awarded. Table 3.2 outlines typical parameters for an offshore cable route geophysical survey campaign targeting penetration of the top 10m of sediment.

Table 3.2: Impulsive sound sources associated with geophysical survey

Geophysical Survey Method	Frequency (kHz)	Source level SPL (peak) in dB re 1 μ Pa	Sources
Multi-beam Echosounder (MBES)	12-400	210-245	Danson (2005), Hopkins (2007), Genesis (2011), Lurton & DeReutier (2011), BEIS (2020)
Side Scan Sonar (SSS)	100-500	200-240	BOEM (2019), BEIS (2020)
Sub-Bottom Profiler (SBP)	0.5–300	196-225	Danson (2005), BOEM (2016), BEIS (2020)

MBES are widely used in the marine environment to measure water depth by emitting rapid pulses of sound towards the seabed and measuring the sound reflected (BEIS 2020). Sound frequencies emitted, in water depths of less than 200m, are typically between 300 and 400kHz (Danson 2005, Hopkins 2007, Lurton & DeReutier 2011). Sound source levels have been reported ranging from 210 – 245dB re 1 μ Pa-m (Genesis 2011, Lurton & DeReutier 2011). Evidence has shown that MBES operating at greater than 200kHz do not cause behavioural responses in harbour porpoise (Dyndo *et al.* 2015).

SSS systems operate at relatively high frequencies (between 100-600kHz) with the higher frequencies (above 160kHz) being outside the hearing thresholds of cetaceans and other marine mammals (Genesis 2011). Maximum source levels for SSS can be up to 228 dB re 1 μ Pa-m (peak SPL) (SCAR 2002, cited by applicant). Little evidence of potential effects to marine mammals from SSS exists. The relatively high frequencies at which SSS operate will attenuate more swiftly than lower frequencies with sound levels reducing rapidly from the source.

SBP systems are used to produce images of the seabed. The resolution and type of images required determines which system is required. Pingers operate on a range of single frequencies between 3.5 kHz and 7 kHz. Boomers have a broader frequency between 500 Hz to 5 kHz and sparkers which generate lower frequencies for maximum penetration in the seabed. CHIRP systems are modern systems designed to replace pingers and boomers. CHIRP systems operate around a central frequency but alternate through a range of frequencies between 3 kHz to 40 kHz. SBP produce sound source levels between 196 and 225 dB re 1 μ Pa – 1 m (rms SPL) which are therefore audible to some marine mammals, particularly harbour porpoise (Danson 2005, King 2013, BOEM 2016).

Most sound energy generated by SBP will be directed towards the seabed and the pulse duration is very short with the survey constantly moving. Lower frequencies generated by SBP are within the hearing range of marine mammals, therefore this type of equipment could have localised, temporary effects on marine mammal behaviour. The UK Department for

Business, Energy & Industrial Strategy (BEIS) undertook noise modelling as part of a review of consented offshore wind farms in the Southern North Sea SAC (designated to conserve harbour porpoise) which was based on the maximum source levels and bandwidths obtained from a range of SBPs. The results of the noise modelling demonstrated that for harbour porpoise in particular the onset of PTS could arise from between 17 m and 23 m from source and potential behavioural effects within 2.4km and 2.5km (BEIS 2020). This was a worst-case scenario with the use of a Chirper with a peak SPL of 267 dB re 1 μ Pa-m.

It is noted that the emitted sound fields from sources such as SBPs, side-scan sonar and echosounders are of much lower amplitude and extent compared to seismic surveys using airguns due to their lower source levels, higher central operating frequencies and greater directionality (narrower beam widths) (e.g. Boebel *et al.* 2005, Genesis 2011). However, very few empirical field data are available to quantify these expectations. The most relevant work to date is part of the study funded by the US BOEM: following the calibrated measurements of Crocker & Fratantonio (2016), measurements were made in shallow (≤ 100 m depth) open-water environments to investigate the propagation of sound from various high-resolution geophysical survey (HRGS) sources (Halvorsen & Heaney 2018). Problems were encountered during the open-water testing resulting in a lack of calibration in the reported sound source levels (Labak 2019). The accompanying advice note (Labak 2019) emphasises that these uncalibrated data should not be used to provide source level measurements, and consequently the reported isopleths (summarising sound propagation) should not replace project-specific sound source verifications. A further project to calibrate these measures and provide an expanded assessment of propagation commenced in 2019.

Despite these caveats, it is worth noting some general patterns observed in Halvorsen & Heaney (2018). In all test environments, broadband received levels from all SBP chirper, echosounder and side-scan sonar devices tested were rapidly attenuated with distance from source, with particularly pronounced fall-off for directional sources when the receiver was outside of the source's main beam. The greatest propagation was generally observed at the deepest test site (100m water depth) from sources generating low frequencies (<10 kHz); by contrast, at 100m water depth, some of the highest frequency sources (>50 kHz) experienced such attenuation that they were only weakly detectable or undetected by recording equipment. In all open-water test environments, broadband received levels did not exceed 160dB re 1 μ Pa (rms)⁶ beyond 200m from any chirper SBP, echosounder or side-scan sonar device tested. While recognising that these results require refining, preliminary evidence suggests that these electromechanical HRGS sources generate a very limited sound field in the marine environment, and of a much lower magnitude than those generated by seismic airgun sources.

The applicant indicates that avoidance behaviour will be temporary, with individuals returning to the area affected once the sound has ceased (e.g. Bowles *et al.* 1994; Morton & Symonds 2002, Stone & Tasker 2006). The geophysical survey investigations will be temporary, being undertaken intermittently over the course of 3 months, therefore any individuals that are disturbed will be able to return to the FLAA as soon as the survey activity has ceased. Given the temporary and localised nature of any disturbance and the distance from the nearest SAC designated for marine mammal qualifying features (>70 km, Saltee Islands SAC), likely significant effects associated with underwater sound changes as a result of the geophysical survey are not expected.

⁶ The 160dB re 1 μ Pa (rms) isopleth represents the acoustic exposure criterion for behavioural disruption from impulsive noise as described by NMFS (2016), although this criterion is not universally adopted in policy or guidance elsewhere (such as the UK).

3.2.3.3 Diving birds

The applicant's explanatory note indicates that most diving bird species have a hearing range of approximately 500Hz to 4kHz (Crowell 2014, Crowell *et al.* 2015, Hansen *et al.* 2017) and as a result, the very high frequency survey activities (multibeam and side scan) and very low frequency activities (vibrocoring, Dynamic Positioning (DP) vessel) would likely be inaudible to these species. The low frequency (0.5 – 300kHz) sub-bottom profiler (pinger/sparker) noise would be within the hearing range of diving species, while the noise from the borehole drilling (1-600Hz) would be towards their lower hearing limit.

The nearest Natura 2000 site with diving birds (cormorant) as a qualifying feature is Mid-Waterford Coast SPA, 11km distant from the FLAA. Whilst Woodward *et al.* (2019) estimated the mean maximum foraging range of this species to be 25.6 ± 8.3 km, the proposed site investigations would only affect a small percentage of the total available foraging area.

The likelihood of a noise sensitive diving bird being in the vicinity of a noise generating operation is very low due to the surface activity associated with such operations disturbing the birds prior to commencement of noise generation (BEIS 2019, Fließbach *et al.* 2019, Garthe & Hüppop 2004, Leopold *et al.* 2009). Given the very low likelihood of interaction between the sound source and a diving bird due to the intervening distances, relatively short exposure time, the temporary and short-term nature of the survey work, the mobile nature of the surveys and the displacement of most diving species due to flushing disturbance, the applicant determined that underwater noise would have no conceivable effect on diving seabirds in the vicinity including those which may forage in the area.

3.2.4 Risk of injury by collision

There is the risk that animals could collide with survey vessels. Shipping collision is a recognised cause of marine mammal mortality worldwide, the key factors influencing the injury or mortality caused by collisions is the ship size and whether its travelling speed. Ships travelling at 14 knots or faster are most likely to cause lethal or serious injuries.

Vessels involved in the proposed site investigations are likely to be either stationary or travelling considerably slower than 14 knots therefore the collision risk is lower than that posed by commercial shipping activity. The risk of injury from collision to marine mammals is very low and will not result in likely significant effects.

3.2.5 Accidental pollution

As indicated in the explanatory note, survey vessels will operate under international standards; including, The International Convention for the Prevention of Pollution from Ships (The MARPOL Convention) with respect to black and grey wastewater and food waste discharges, which are designed to eliminate impacts to coastal waters, and reduce the levels of discharge in offshore waters. Therefore, no effects are expected.

Summary: It is concluded that the applicant correctly identifies the major potential sources of effects from the proposed site investigations that could affect qualifying interests of Natura 2000 sites.

3.3 Identification of relevant sites and features

The applicant indicates that while all European Sites with marine components within 15km of the FLAA have been screened (Figure 3.1) in line with guidance (DoEHLG 2010), consideration has also been given to how sensitive receptors could be affected and what the zone of influence (the geographical extent over which an effect on the receiving environment is predicted to occur) is likely to be. Table 3.3 defines the search areas used to identify relevant European Sites for screening and the associated zones of influence with justifications for each receptor provided below.

Table 3.3: Search areas and zone of influence

Interest feature	Species	Search area	Zone of influence
Fish	Twaite shad	40km	<100m
Birds	Most seabird species	15km	2km
	Divers, seaduck	15km	4km
Cetacean	Harbour porpoise	Celtic and Irish Sea MU	5km (disturbance)
	Bottlenose dolphin	Irish Sea and offshore Channel and SW England	
Pinniped	Grey seal	100km	
	Harbour seal	50km	
Otter		FLAA +20km	250m

3.3.1 Annex I habitats

The geographical extent of the likely zone of influence for non-mobile receptors such as benthic communities will represent the required search area for relevant European Sites. Given that sampling points have not been determined, the zone of influence for benthic communities has been assumed to be the entire FLAA. Relevant sites would include SACs designated for Annex I habitats which support benthic communities. Therefore, only SACs designated for benthic habitats which the FLAA passes directly through have been screened for Annex I habitats.

3.3.2 Fish

All SACs within 40km of the FLAA have been screened for the presence of Annex II migratory fish species as Qualifying Interests, in recognition that as mobile species, fish could potentially enter the FLAA.

Twaite shad (Clupidae family) are the only hearing specialist fish present within the survey area that is a Qualifying Interest of a European Site (Blackwater River (Cork/Waterford) SAC). Twaite shad occur in coastal waters and in estuaries along the southeast coast of Ireland. They are anadromous, migrating to freshwater to spawn in early summer (May to July). At maturity (3 years old for males and 5 years old for females), they stop feeding and congregate in the estuaries of suitable rivers in April and May. Twaite shad are likely to be found in coastal areas of the FLAA all year round, with the greatest density likely to be observed during the May-July migration.

The zone of influence with respect to twaite shad appears to be informed by Nedwell *et al.* (2012) who reviewed herring sensitivity to sources of noise from non-impulsive cable laying operations (i.e. cable lay and trenching) and proposed effect ranges. Based on this, the

applicant indicates that clupeids are expected to show strong avoidance behaviour (i.e. reaction by virtually all individuals) within 8m of the works (presumably works refers to the continuous low frequency noise produced by the survey vessel), whilst significant avoidance (85% of individuals will react to noise) is expected within 66m. See also Section 3.2.3.1 above.

3.3.3 Birds

The applicant notes advice on how to present assessment information on the extent and potential consequences of seabird displacement from offshore wind farm developments published by the UK Joint Statutory Nature Conservation Bodies (JNCC 2017, note that this was updated in January 2022⁷), which indicates that for most bird species a standard displacement buffer of 2km is recommended. For divers and sea ducks this should be extended to 4km (10km for red-throated diver). The applicant has used the windfarm guidance as a proxy, recognising that the effects from site investigations will be significantly lower than from windfarm construction and therefore the use of the guidance is a more conservative approach to assessment.

The most vulnerable birds to disturbance would be nesting birds in the breeding season in the immediate vicinity of the proposed site investigations. Disturbance to nesting birds caused by the presence of the survey vessel could have an effect on the success rate of the breeding population. The zone of influence of disturbance on nesting birds has been assessed as up to 2km from the FLAA.

To allow for the mobility of bird species which could forage into the zone of influence, all SPAs within 15km have been screened in.

3.3.4 Marine mammals

Annex II listed species likely to be observed in the FLAA include grey seal, harbour seal, European otter, common bottlenose dolphin and harbour porpoise.

There are no published guidelines on disturbance thresholds due to the complexity and variability of the responses of marine mammals to anthropogenic disturbance (as discussed in Southall *et al.* (2021)). In relation to geophysical surveys, the UK JNCC have established an effective deterrent range (EDR) of 5km for geophysical surveys (JNCC 2020). Relevant sites would include SACs designated for marine mammals within 5km of the FLAA. However, in recognition of the highly mobile nature of marine mammals, the following has been assumed and used to define the area of search for relevant European Sites:

- Any harbour porpoise or common bottlenose dolphin from European Sites located in the relevant Management Unit (MU) could be present in the FLAA. The MU for harbour porpoise is the Celtic and Irish Sea; for bottlenose dolphin it is the Irish Sea and offshore Channel and SW England.
- Harbour seal are not known to make trips greater than 50km from haul out sites with grey seals known to make longer trips (DECC 2016).
- Otters are known to have a home range of 20km (NatureScot 2020).

Summary: It is considered that the applicant has used an evidence-based approach to defining the Zol of the project to enable the selection of relevant sites. The distance-based

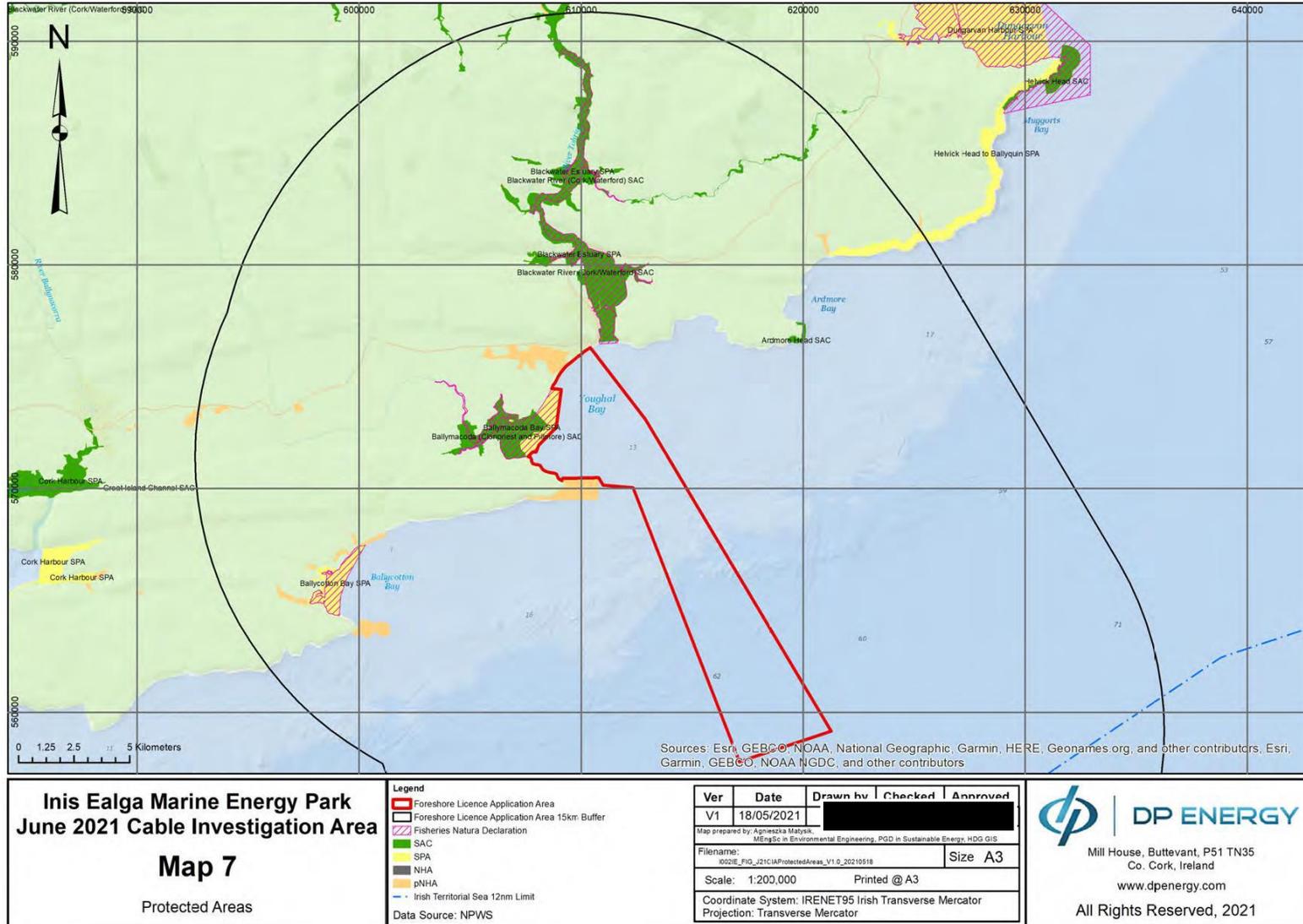
⁷<https://data.jncc.gov.uk/data/9aecb87c-80c5-4cfb-9102-39f0228dcc9a/joint-sncb-interim-displacement-advice-note-2022.pdf>

criteria are suitably precautionary to ensure that those qualifying interests most likely to be affected by the proposals have been identified for consideration in the screening.

3.4 Sites identified by the applicant to be screened for AA

The sites identified by the applicant to be within the search area associated with the proposed site investigations were subject to screening assessment. The high level outcome for each site is presented in Table 3.4. The table lists the sources of potential likely significant effect which are considered against each of the relevant sites and their qualifying interests. Where a potential for LSE has been identified (shaded cell) this is indicated for the relevant qualifying interest against the possible effect. Blank cells indicate those impacts which were screened out as the habitat or species were outside of the ZOI or there was no pathway of effect.

Figure 3.1: SACs and SPAs within 15km of the FLAA



Inis Ealga Marine Energy Park
June 2021 Cable Investigation Area
Map 7
 Protected Areas

Ver	Date	Drawn by	Checked	Approved
V1	18/05/2021	[Redacted]	[Redacted]	[Redacted]

Map prepared by: Agnieszka Matyska
 MEngSc in Environmental Engineering, PGD in Sustainable Energy, HDG GIS

Filename: 002\FIG_011\IAProtectedAreas_V1_0_20210518 Size A3

Scale: 1:200,000 Printed @ A3

Coordinate System: IRENET95 Irish Transverse Mercator
 Projection: Transverse Mercator

<p>Legend</p> <ul style="list-style-type: none"> Foreshore Licence Application Area Foreshore Licence Application Area 15km Buffer Fisheries Natura Declaration SAC SPA NHA pNHA Irish Territorial Sea 12nm Limit <p>Data Source: NPWS</p>	
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Table 3.4: Sites screened for likely significant effect and the high level outcome for each site

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
SACs							
Ballymacoda (Clonpriest and Pillmore) SAC	IE000077	0.05	Estuaries				
			Mudflats and sandflats not covered by seawater at low tide				
			<i>Salicornia</i> and other annuals colonising mud and sand				
			Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)				
			Mediterranean salt meadows (<i>Juncetalia maritimi</i>)				
Blackwater River (Cork/ Waterford) SAC	IE002170	0.5	Estuaries				
			Mudflats and sandflats not covered by seawater at low tide				
			Perennial vegetation of stony banks				
			<i>Salicornia</i> and other annuals colonising mud and sand				
			Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)				
			Mediterranean salt meadows (<i>Juncetalia maritimi</i>)				
			Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation				
			Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles				
			Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno- Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)				
			Freshwater pearl mussel				
			White-clawed crayfish				
Brook lamprey							

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
			Twaite shad			LSE	
			Sea lamprey			No LSE	
			River lamprey				
			Salmon				
			Otter				
			Killarney fern				
Roaringwater Bay and Islands SAC	IE000101	110	Large shallow inlets and bays				
			Reefs				
			Submerged or partially submerged sea caves				
			Vegetated sea cliffs of the Atlantic and Baltic coasts				
			European dry heaths				
			Otter				
			Grey seal				No LSE
			Harbour porpoise				
Rockabill to Dalkey Island SAC	IE003000	188	Reefs				
			Harbour porpoise			No LSE	No LSE
Saltee Islands SAC	IE000707	72	Mudflats and sandflats not covered by seawater at low tide				
			Large shallow inlets and bays				
			Reefs				
			Submerged or partially submerged sea caves				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
			Vegetated sea cliffs of the Atlantic and Baltic coasts				
			Grey seal			No LSE	No LSE
Bristol Channel Approaches/ Dynesfeydd Mor Hafren SAC	UK0030396	177	Harbour porpoise			No LSE	No LSE
Cardigan Bay/ Bae Ceredigion SAC	UK0012712	191	Bottlenose dolphin			No LSE	No LSE
North Anglesey Marine/ Gobledd Mon Forol SAC	UK0030398	233	Harbour porpoise			No LSE	No LSE
North Channel SAC	UK0030399	297	Harbour porpoise			No LSE	No LSE
West Wales Marine/ West Gorllewin Crymru Forol SAC	UK0030397	142	Harbour porpoise			No LSE	No LSE
SPAs							
Ballycotton Bay SPA	IE004022	8	Teal				
			Ringed plover				
			Golden plover				
			Grey plover				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
			Lapwing				
			Black-tailed godwit				
			Bar-tailed godwit				
			Curlew				
			Turnstone				
			Common gull				
			Lesser black-backed gull				
			Wetland and waterbirds				
Ballymacoda Bay SPA	IE004023	0.01	Wigeon				
			Teal				
			Ringed plover				
			Golden plover				
			Grey plover				
			Lapwing				
			Sanderling				
			Dunlin				
			Black-tailed godwit				
			Bar-tailed godwit				
			Curlew				
			Redshank				
			Turnstone				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
			Black-headed gull				
			Common gull				
			Lesser black-backed gull				
			Wetland and waterbirds				
Blackwater Estuary SPA	IE004028	2	Wigeon				
			Golden plover				
			Lapwing				
			Dunlin				
			Black-tailed godwit				
			Bar-tailed godwit				
			Curlew				
			Redshank				
			Wetland and waterbirds				
Cork Harbour SPA	IE004030	19	Little grebe				
			Great crested grebe				
			Cormorant				
			Grey heron				
			Shelduck				
			Wigeon				
			Teal				
			Pintail				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
			Shoveler				
			Red-breasted merganser				
			Oystercatcher				
			Golden plover				
			Grey plover				
			Lapwing				
			Dunlin				
			Black-tailed godwit				
			Bar-tailed godwit				
			Curlew				
			Redshank				
			Black-headed gull				
			Common gull				
			Lesser black-backed gull				
			Common tern				
Wetland and waterbirds							
Helvick Head to Ballyquin SPA	IE004192	11	Cormorant		No LSE		
			Peregrine				
			Herring gull				
			Kittiwake				
			Chough				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
Dungarvan Harbour SPA	IE004032	19	Great crested grebe				
			Light-bellied brent goose				
			Shelduck				
			Red-breasted merganser				
			Oystercatcher				
			Golden plover				
			Grey plover				
			Lapwing				
			Knot				
			Dunlin				
			Black-tailed godwit				
			Bar-tailed godwit				
			Curlew				
			Redshank				
			Turnstone				
Wetland and waterbirds							
Mid-Waterford Coast SPA	IE004193	11	Cormorant		No LSE		
			Herring gull				
			Peregrine				
			Chough				

Screening for Appropriate Assessment

Site name	Site code	Distance to FLAA (km)	Qualifying interests	Penetration and/or disturbance	Visual disturbance	Underwater sound changes	Vessel collision
Sovereign Islands SPA	IE004124	12	Cormorant		No LSE		

3.5 In-combination effects

The applicant conducted a search of Foreshore Applications for surveys or other activities which could interact with the proposed site investigation works using the Department of Housing, Local Government and Heritage 'Applications and Determinations' website. The FLAA is part of the wider IEMEP, therefore projects which could interact with the IEMEP were included within the assessment. Commercial fisheries, shipping interests and recreational use were scoped out as these were considered to represent baseline conditions. No existing pipelines and cables were identified within the FLAA. Whilst the applicant indicates the potential for temporal and spatial overlap with other projects, no screening for potential in-combination effects was provided. From information provided by the applicant, a consideration of the potential for in-combination effects is included in italics.

The following projects were identified by the applicant (see Figure 3.2):

- **PiPiper infrastructure fibre optic data cable, Ballycotton Bay, Cork** (intersects with IEMEP FLA). The foreshore licence application was submitted in October 2014 and installation was planned to commence in 2015. This application is still under consultation which suggests the project has been put on hold. *No in-combination effects with the proposed site investigations are likely.*
- **Greenlink Interconnector – Greenlink Interconnector Limited, Baginbun Beach, Wexford** (70km from FLAA). A Foreshore Licence application was submitted on 21 December 2017 to carry out survey works to assess the site and seabed in order to select an optimum route for two submarine electricity power cables. Public consultation was carried out from 23 January 2018 to 22 February 2018. Although the DHLGH website indicates that the application is still in the 'Consultation' phase, IEMEP Ltd. is aware that the licence was granted and geophysical surveys were completed in autumn 2018. A second Foreshore Licence application was submitted in August 2019 (ref FS007050) for the installation of the interconnector and is currently under consultation. Cable installation is due to start between 2020-2023, subject to obtaining the necessary permits and consents. There is therefore the potential that cable installation works could occur at the same time as the proposed site investigations at Inis Ealga. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally but given distance from FLAA, these are unlikely to be significant.*
- **Celtic Sea Array Survey, Waterford** (25.5km from FLAA). A foreshore licence application was submitted on 19 March 2019, to carry out survey works to assess the site and seabed to assess the suitability of two areas of interest for cable installation associated with a potential circa 800MW offshore wind development. The proposed survey works will likely be carried out between April and October within the five years following award of the Foreshore Licence. The geophysical survey campaign is expected to take up to 2 months. Geotechnical survey works will be undertaken once geophysical works have been completed and the necessary archaeological assessment of data has been carried out. Geotechnical survey works are expected to take up to 3 months. DHLGH website indicates that the application is still in the 'Consultation' phase which would indicate that a Foreshore Licence has not yet been granted. There is potential that the survey works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*
- **North Celtic Sea Wind project, Energia** (13km from FLAA). A foreshore licence application was submitted on May 2019, to determine optimum windfarm layout design of a 600-1000MW development. The FLA stated that the proposed survey works will likely be carried out between April and September 2020 with the completion campaign

being carried out in spring/summer 2021. The geophysical survey campaign is expected take up to 3 months. Geotechnical survey works will be undertaken once geophysical works have been completed and the necessary archaeological assessment of data has been carried out. Geotechnical survey works are expected to take up to 2 months. DHLGH website indicates that the application is still in the 'Consultation' phase which would indicate that a Foreshore Licence has not yet been granted. There is potential that the survey works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*

- **Simply Blue - Emerald offshore windfarm site investigations, Kinsale, Cork** (17km from FLAA). A foreshore licence application (FS007139) was made to DHLGH on 19 May 2020 for site investigations to assess the potential of offshore wind power generation. The project is ca. 35-60 km from the coast and includes a total site area of 835.36 km² with a potential output of approx. 1000MW. The application is for permission to conduct surveys 12 NM off Cork Harbour to determine project design and site selection. The intention is for the proposed surveys to begin in Summer 2021 with a staged programme of investigations being carried out over five years. The proposed survey works consists of geophysical survey, geotechnical surveys, wind resource monitoring, metocean surveys, nearshore and intertidal surveys and environmental surveys. At present there is no time frame for when each element of survey work will take place. There is potential that the survey works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*
- **Celtic One – ESB FLA** (intersects offshore section of FLAA). The proposed Celtic One Offshore Wind Farm development project site will be refined over time and it is anticipated that the final windfarm area is likely to be in the order of 120 km² which is approximately 45% of the overall turbine array study area (subject to detailed layout/energy analysis). The expected capacity output of the project will be approximately 600MW. This project is being developed as a deep water fixed foundation offshore windfarm for delivery by 2030 as it is expected that ongoing developments in design, manufacture, transport, and installation of fixed foundations will allow developments in water depths up to 80m whilst maintaining competitive cost advantage against floating wind platforms in this time period. For the purpose of the Foreshore Licence application covering site investigations made in December 2020 (FS007138⁸), the application area includes Celtic One Offshore Wind and the export cable corridor for Celtic Two Offshore Wind. Noting that the export cable corridor area of search is the only aspect of Celtic Two Offshore Wind located within the 12nm limit with the turbine array area of search located beyond. At present there is no time frame for when each element of survey work will take place. There is potential that the site investigation works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*
- **Celtic Two – ESB FLA** (19.5km from FLAA). The Celtic Two Offshore Wind Farm will be the second phase development for ESB, following the completion of Celtic One OWF. This site is located approximately 12km from the FLAA. The FS007138 Foreshore Licence application for site investigations (see above) indicates that the project study area for Celtic Two Offshore Wind extends beyond the 12nm foreshore limit. The applicant noting that if and when additional permissions for investigation works for the area beyond the 12nm limit are required and a process is in place to facilitate applications, those will be sought. At present there is no time frame for when

⁸ <https://www.gov.ie/en/foreshore-notice/b14d6-esb-celtic-offshore-wind-site-investigations-off-waterford-and-cork/>

each element of survey work will take place. There is potential that the site investigation works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*

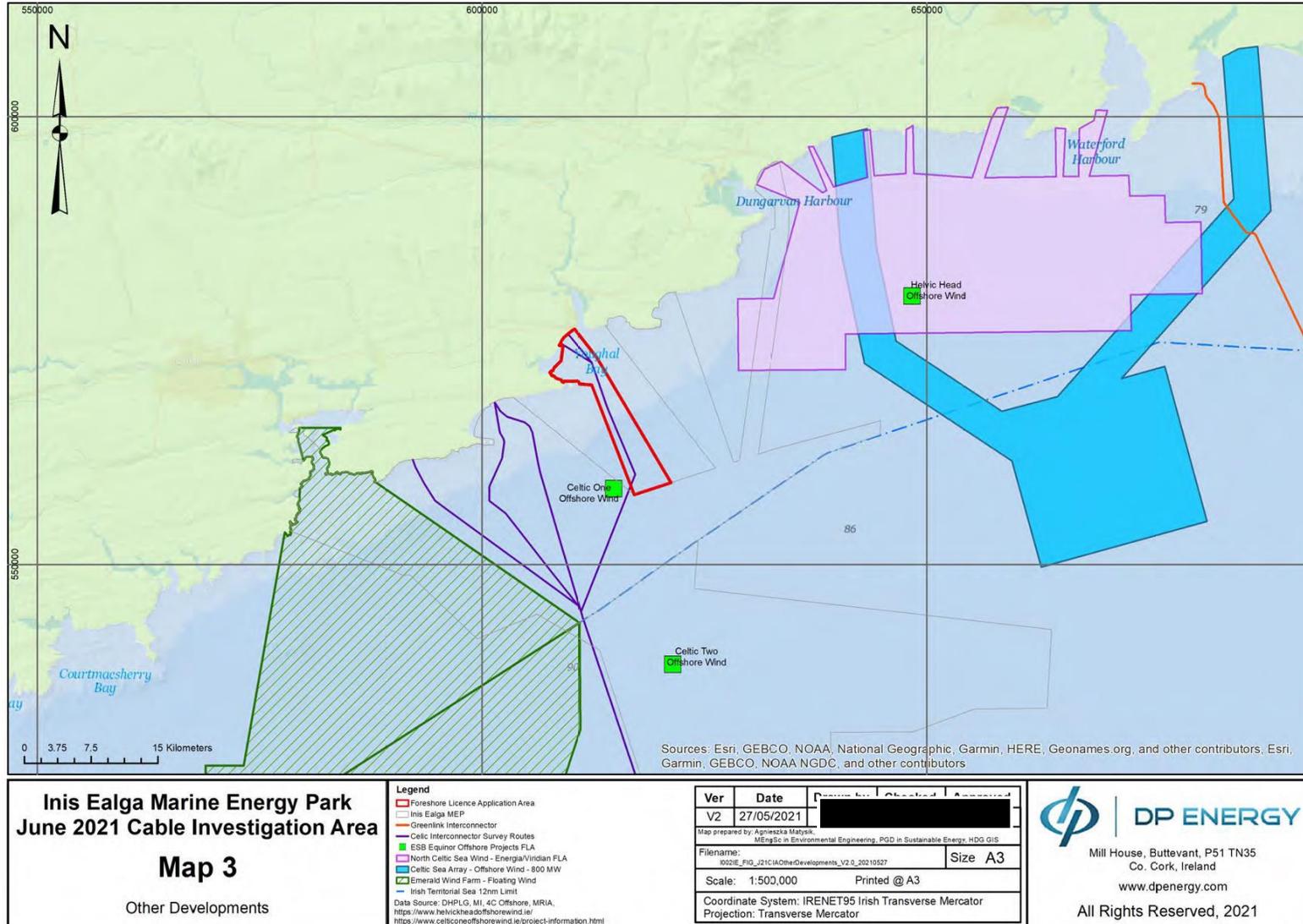
- **Helvick Head – ESB FLA** (34km from FLAA). The Helvick Head OWF is located approximately 12km from the FLAA. The site is likely to be in the order of 140km² which is approximately 40% of the overall turbine array study area. A Foreshore Licence application covering site investigations was made in December 2020 (FS007136⁹). The applicant's Screening for AA report¹⁰ indicates that site investigations and baseline survey work could commence on a phased approach in Q2/Q3 2022 with surveys proceeding over the course of the 5-year licence period. There is potential that the site investigation works for this project would overlap (in time) with the Inis Ealga proposed site investigations. *Potential for in-combination effects associated with underwater noise on marine mammals if surveys overlap temporally.*
- **Celtic Interconnector** (intersects FLAA). The Celtic Interconnector is a planned subsea (undersea) link to allow the exchange of electricity running from the south coast of Ireland to the north-west coast of France. This cable will landfall at Claycastle Beach in Youghal, Co. Cork and the estimated completion date for installation is 2026. A Foreshore Licence application for the project was made in June 2021 (FS006916¹¹). Construction of the project is expected to commence in 2023 and be fully operational in 2027. There is therefore potential that the installation of this project could overlap with the Inis Ealga proposed site investigations. A planning application for the Celtic Interconnector was submitted to the An Bord Pleanála, case reference: VC04.302725, signed 02/06/2021. *Given the potential spatial and temporal overlap, there is the potential for in-combination effects associated with visual disturbance of birds, underwater noise on marine mammals and twaite shad.*

⁹ <https://www.gov.ie/en/foreshore-notice/338fa-esb-wind-development-limited-site-investigations-off-waterford-and-cork-coasts-helvick-head-offshore-wind/>

¹⁰ <https://assets.gov.ie/214281/bbcc6a5c-ab6c-4c77-8d04-a80a7dada904.pdf>

¹¹ <https://www.gov.ie/en/foreshore-notice/7bfb1-eirgrid-celtic-interconnector-electricity-cable/>

Figure 3.2: Location of other relevant projects with respect to the FLAA



3.6 Transboundary effects

No transboundary effects were identified.

3.7 Screening conclusion

Finding of no significant effects statement:
The applicant provides a reasonably clear explanation of the basis for site selection based on the nature of the potential effects, their likely zone of influence and the sensitivity of relevant qualifying interests.
SACs
LSE was discounted for the following sites for all sources of potential effect: <ul style="list-style-type: none"> • Ballymacoda (Clonpriest and Pillmore) SAC • Roaringwater Bay and Islands SAC • Rockabill to Dalkey Island SAC • Saltee Islands SAC • Bristol Channel Approaches/ Dynesfeydd Mor Hafren SAC • Cardigan Bay/ Bae Ceredigion SAC • North Anglesey Marine/ Gobledd Mon Forol SAC • North Channel SAC • West Wales Marine/ West Gorllewin Cymru Forol SAC <p>Additionally, LSE was discounted for all sources of effect for all of the qualifying interests of the Blackwater River (Cork/ Waterford) SAC, with the exception of the twaite shad qualifying interest.</p> <p>It is accepted that likely significant effects can be discounted for these SAC sites and their qualifying interests.</p>
SPAs
LSE was discounted for the following sites for all sources of potential effect: <ul style="list-style-type: none"> • Ballycotton Bay SPA • Ballymacoda Bay SPA • Blackwater Estuary SPA • Cork Harbour SPA • Helvick Head to Ballyquin SPA • Dungarvan Harbour SPA • Mid-Waterford Coast SPA • Sovereign Islands SPA <p>It is accepted that likely significant effects can be discounted for these SPA sites and their qualifying interests.</p>

Consultation with conservation authorities
The consultation feedback from prescribed bodies is provided in Table 1.1. Comments relating to Natura 2000 aspects of the application were received from Inland Fisheries Ireland, the DHLGH Marine Advisor and the Marine Institute.
Screening determination
SACs
LSE on the following qualifying interest and site could not be ruled out with respect to underwater noise changes associated with the proposed site investigations: <ul style="list-style-type: none"> • Blackwater River (Cork/ Waterford) SAC (twaite shad) <p>It is accepted that a likely significant effect cannot be discounted for this site and qualifying interest and that Stage 2 Appropriate Assessment is required.</p>
SPAs
No sites or qualifying interests identified.

BIBLIOGRAPHY

- BEIS (2020). Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SAC, 294pp
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/921754/RoC_SNS_SAC_HRA_FINAL.pdf
- Boebel O, Clarkson OP, Coates R, Larter R, O'Brien PE, Ploetz J, Summerhayes C, Tyack T, Walton DWH & Wartzok D (2005). Risks posed to the Antarctic marine environment by acoustic instruments: a structured analysis. *Antarctic Science* **17**: 533-540.
- BOEM (2017). BOEM: Best Management Practices Workshop for Atlantic Offshore Wind Facilities. Overview of NMFS 2016 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. https://www.boem.gov/sites/default/files/renewable-energy-program/Day-1_Afternoon_Scholik_Overview_of_Guidance.pdf
- Bowles AE, Smultea M, Wuesig B, DeMaster DP & Palka P (1994). Relative abundance and behavior of marine mammals exposed to transmissions from the Heard Island Feasibility Test. *The Journal of the Acoustical Society of America* **96**: 2469-84, doi 10.1121/1.410120.
- Carroll AG, Przeslawski R, Duncan A, Gunning M, Bruce B (2017). A critical review of the potential impacts of marine seismic surveys on fish & invertebrates. *Marine Pollution Bulletin* **114**, 9-24.
- Codling Wind Farm (2020). Codling Wind Park Geophysical and Geotechnical Surveys - European Protected Species Risk Assessment, 25pp. <https://assets.gov.ie/79880/2f4d3487-a3ea-4682-96d5-b703871bbd11.pdf>
- 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.
- Crowell S (2014). In-air and underwater hearing in ducks. Doctoral dissertation, University of Maryland.
- Crowell SE, Wells-Berlin AM, Carr CE, Olsen GH, Therrien RE, Yannuzzi SE & Ketten DR (2015). A comparison of auditory brainstem responses across diving bird species. *Journal of Comparative Physiology A* **201**: 803-815.
- Danson E (2005). Geotechnical and geophysical investigations for offshore and nearshore developments. Written and produced by Technical Committee 1, International Society for Soil Mechanics and Geotechnical Engineering, September 2005.
- DECC (2016). Offshore Energy Strategic Environmental Assessment 3, Environmental Report. Department of Energy and Climate Change, UK, 652pp plus appendices.
- Department of Environment, Heritage and Local Government (2010). Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.
- Dyndo M, Wisniewska DM, Rojano-Donate L & Madsen PT (2015). Harbour porpoises react to low levels of high frequency vessel noise. *Scientific Reports* **5**: 11083.
- Erbe C, Marley SA, Schoeman RP, Smith JN, Trigg LE, Embling CB (2019). The effects of ship noise on marine mammals - A Review. *Frontiers in Marine Science* **6**: 606.
- Erbe C & McPherson C (2017). Underwater noise from geotechnical drilling and standard penetration testing. *The Journal of the Acoustical Society of America* **142**: EL281.
- European Commission (2002). Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission, 81pp.
- European Commission (2019). Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. 80pp.
- European Commission (2021). Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission, 114pp.
- Fliessbach KL, Borkenhagen K, Guse N, Markones N, Schwemmer P & Garthe S (2019). A Ship Traffic Disturbance Vulnerability Index for Northwest European Seabirds as a Tool for Marine Spatial Planning. *Frontiers in Marine Science* **6**: 192.

- Garthe S & Hüppop O (2004). Scaling possible adverse effects of marine windfarms on seabirds: developing and applying a vulnerability index. *Journal of Applied Ecology* **41**: 724-734.
- Genesis (2011). Review and Assessment of Underwater Sound Produced from Oil and Gas Sound Activities and Potential Reporting Requirements under the Marine Strategy Framework Directive. Report to Department of Energy and Climate Change. Genesis Oil and Gas Consultants, 72pp.
- Gordon JG, Gillespie D, Potter J, Frantzis A, Simmonds M, Swift RJ & Thompson D (2004). A review of the effects of seismic survey on marine mammals. *Marine Technology Society Journal* **37**: 14-34.
- Halvorsen MB & Heaney KD (2018). Propagation Characteristics of High-Resolution Geophysical Surveys: Open Water Testing. OCS Study BOEM 2018-052, 806p.
- Hansen KA, Maxwell A, Siebert U, Larsen ON, Wahlberg M. 2017. Great cormorants (*Phalacrocorax carbo*) can detect auditory cues while diving. *The Science of Nature* **104**: 45.
- Harding H, Bruintjes R, Radford AN & Simpson SD (2016). Measurement of hearing in the Atlantic salmon (*Salmo salar*) using auditory evoked potentials, and effects of pile driving playback on salmon behaviour and physiology. Scottish Marine and Freshwater Science Report 7 No 11, 51pp.
- Hawkins AD & Johnstone ADF (1978). The hearing of Atlantic Salmon (*Salmo salar*). *Journal of Fish Biology* **13**: 655-673.
- Hopkins A (2007). Recommended operating guidelines (ROG) for swath bathymetry. https://www.emodnet-seabedhabitats.eu/media/1654/gmhm3_swath_bathymetry_rog.pdf
- JNCC (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). JNCC Report No. 654, JNCC, Peterborough, 16pp.
- King SL (2013). Seismic survey licensing: subbottom profile surveys. SMRU Marine Ltd report number SMRUL-DEC-2013-024. September 2013
- Labak SJ (2019). Memorandum for the Record, concerning utilization of the data and information in the Bureau of Ocean Management (BOEM) OCS Study 2018-052, "Propagation Characteristics of High-Resolution Geophysical Surveys: Open Water Testing," by Halvorsen MB & Heaney KD, 2018. 4pp.
- Leopold MF, Camphuysen CJ, Verdaat H, Dijkman EM, Meesters HWG, Aarts GM, Poot M & Fijn R (2009). Local birds in and around the Offshore Wind Park Egmond aan Zee (OWEZ) (T-0 & T-1). NoordzeeWind Rapport OWEZ R 221 T1 20090605.
- Lurton X & DeReutier S (2011). Sound radiation of seafloor-mapping echosounders in the water column, in relation to the risks posed to marine mammals. *International Hydrographic Review* 7-17.
- Mattson MG, Thomas JA & Aubin DS (2005). Effects of boat activity on the behaviour of bottlenose dolphins (*Tursiops truncatus*) in waters surrounding Hilton Head Island, South Carolina. *Aquatic Mammals* **31**: 133-140.
- Mickle MF, Miehl SM, Johnson NS, Higgs DM (2019). Hearing capabilities and behavioural response of sea lamprey (*Petromyzon marinus*) to low-frequency sounds. *Canadian Journal of Fisheries and Aquatic Sciences* 2019 **76**(9), 1541-1548.
- Morton A & Symonds HK (2002). Displacement of *Orcinus orca* (L.) by high amplitude sound in British Columbia, Canada. *ICES Journal of Marine Science* **59**: 71-80.
- NatureScot. (2020). Otter. <https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter>
- Nedwell J, Mason T, Barham R & Chessman S (2012). Assessing the environmental impact of underwater noise during offshore windfarm construction and operation. Proceedings of Acoustics 2012, Fremantle, Australia. https://www.acoustics.asn.au/conference_proceedings/AAS2012/papers/p116.pdf
- Nedwell JR, Parvin SJ, Edwards B, Workman R, Brooker AG & Kynoch JE (2007). Measurement and interpretation of underwater noise during construction and operation of offshore windfarms in UK waters. Report commissioned by COWRIE Ltd, 85pp. https://tethys.pnnl.gov/sites/default/files/publications/COWRIE_Underwater_Noise_Windfarm_Construction.pdf
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. 46pp.

- OSPAR (2011). Pressure list and descriptions. Intersessional Correspondence Group on Cumulative Effects – Amended 25th March 2011, 14pp. <https://data.jncc.gov.uk/data/1e136107-1396-4c67-b755-dc9f43bf3bb1/20110328-ICG-C-Pressures-list-v4.pdf>
- Palka DL & Hammond PS (2001). Accounting for responsive movement in line transect estimates of abundance. *Canadian Journal of Fisheries and Aquatic Sciences* **58**: 777–787.
- Pirotta E, Merchant MD, Thompson PM, Barton TR & Lusseau D (2015). Quantifying the effect of boat disturbance on bottlenose dolphin foraging activity. *Biological Conservation* **181**: 82–89.
- Popper AN & Hastings MC (2009). The effects of human-generated sound on fish. *Integrative Zoology* **4**: 43-52.
- Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol S, Carlson TJ, Coombs S, Ellison WT, Gentry RL, Halvorsen MB, Løkkeborg S, Rogers PH, Southall BL, Zeddies DG & Tavolga WN (2014). Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI.
- Richardson WJ, Greene CR Jr, Malme CI & Thomson DH (1995). Marine mammals and noise. Academic Press, San Diego, CA, USA, 576pp.
- Rolland RM, Parks SE, Hunt KE, Castellote M, Corkeron PJ, Nowacek DP, Wasser SK & Kraus SD (2012). Evidence that ship noise increases stress in right whales. *Proceedings of the Royal Society B* **279**: 2363-2368.
- Sarnocińska J, Teilmann J, Balle JD, van Beest FM, Delefosse M & Tougaard J (2020). Harbour porpoise (*Phocoena phocoena*) reaction to a 3D seismic airgun survey in the North Sea. *Frontiers in Marine Science* **6**: 824
- Schwarz AL & Greer GL (1984). Responses of Pacific herring, *Clupea harengus pallasii*, to some underwater sounds. *Canadian Journal of Fisheries and Aquatic Sciences* **41**: 1183–1192.
- Showler DA, Stewart GB, Sutherland WJ & Pullin AS (2010). What is the impact of public access on the breeding success of ground-nesting and cliff-nesting birds? CEE review 05-010 (SR16).
- Southall B, Finneran JJ, Reichmuth C, Nachtigall PE, Ketten DR, Bowles AE, Ellison WT, Nowacek DP & Tyack PL (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals* **45**: 125-232.
- Southall B, Nowacek DP, Bowles AE, Senigaglia V, Bejder L, & Tyack PL (2021). Marine Mammal Noise Exposure Criteria: Assessing the Severity of Marine Mammal Behavioral Responses to Human Noise. *Aquatic Mammals* **47**: 421-464.
- Southall BL, Bowles AE, Ellison WT, Finneran JJ, Gentry RL, Greene Jr. CR, Kastak D, Ketten DR, Miller JH, Nachtigall PE, Richardson WJ, Thomas JA & Tyack PL (2007). Marine mammal noise exposure criteria: Initial scientific recommendations. *Aquatic Mammals* **33**: 411-522.
- Stone CJ & Tasker ML (2006). The effects of seismic airguns on cetaceans in UK waters. *Journal of Cetacean Research and Management* **8**: 255-264.
- Teague N & Clough SC (2011). Investigations into the response of 0+ twaite shad (*Alosa fallax*) to ultrasound and its potential as an entrainment deterrent. *International Fish Screening Techniques* **71**: 153-163.
- Thompson PM, Brookes KL, Graham IM, Barton TR, Needham K, Bradbury G & Merchant ND (2013). Short-term disturbance by a commercial two-dimensional seismic survey does not lead to long-term displacement of harbour porpoises. *Proceedings of the Royal Society B* **280**: 20132001.
- Valente JJ & Fischer RA (2011). Reducing human disturbance to waterbird communities near corps of engineers projects. Report reference ERDC TN-DOER-E29. https://www.researchgate.net/profile/Richard-Fischer-6/publication/257811861_Reducing_Human_Disturbance_to_Waterbird_Communities_Near_Corps_of_Engineers_Projects/links/00463525e05f28b8a8000000/Reducing-Human-Disturbance-to-Waterbird-Communities-Near-Corps-of-Engineers-Projects.pdf?origin=publication_detail
- Willis MR, Broudie M, Bhurosah M & Masters I (2010). Noise Associated with Small Scale Drilling Operations. 3rd International Conference on Ocean Energy, 6 October, Bilbao, 6pp. https://www.icoe-conference.com/publication/noise_associated_with_small_scale_drilling_operations/
- Wisniewska DM, Johnson M, Teilmann J, Siebert U, Galatius A, Dietz R & Madsen PT (2018). High rates of vessel noise disrupt foraging in wild harbour porpoises (*Phocoena phocoena*). *Proceedings of the Royal Society B* **285**: 20172314. <http://dx.doi.org/10.1098/rspb.2017.2314>

Woodward I, Thaxter CB, Owen E & Cook ASCP (2019). Desk-based revision of seabird foraging ranges used for HRA screening. Report of work carried out by the British Trust for Ornithology on behalf of NIRAS and The Crown Estate. BTO Research Report No. 724, 139pp.