



Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume III, Appendix 25.4: Invasive Non-Indigenous Species
Management Plan



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1.0	17/05/2024	Final (External)	GoBe Consultants	GoBe Consultants	Sure Partners Limited

Statement of Authority

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Contents

FIGURES.....	III
TABLES.....	III
GLOSSARY.....	IV
ACRONYMS.....	VI
UNITS.....	VIII
1 INVASIVE NON-INDIGENOUS SPECIES MANAGEMENT PLAN.....	1
1.1 INTRODUCTION.....	1
1.2 PROJECT BACKGROUND AND CONSENTS.....	4
1.3 ROLES AND RESPONSIBILITIES.....	7
1.4 INVASIVE ALIEN SPECIES MANAGEMENT PLAN METHODOLOGY.....	8
1.5 ARKLOW BANK WIND PARK 2 INVASIVE ALIEN SPECIES MANAGEMENT PLAN.....	13
1.6 USEFUL SOURCES OF INFORMATION.....	21
1.7 REFERENCES.....	22

Figures

Figure 25.4.1: Location of the Proposed Development.....	5
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Tables

Table 25.4.1: Linkages with other consents management plans.....	6
Table 25.4.2: Roles and Responsibilities in Relation to the INISMP.....	7
Table 25.4.3: Example of low and significant risk sites (Cook <i>et al.</i>, 2015).....	8
Table 25.4.4: Questions considered for the purpose creating this INISMP (Cook <i>et al.</i>, 2015). ..	10
Table 25.4.5: Vessel and foundation types to be used in the Proposed Development and/or involved in the operation.....	14
Table 25.4.6: Site activities which have a significant risk of introducing or spreading IAS.....	16
Table 25.4.7: Instructions for checks of IAS.....	18
Table 25.4.8: Contingency Plan.....	19

Glossary

Term	Meaning
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore wind farm in Ireland.
Arklow Bank Wind Park 2 – Offshore Infrastructure	“The Proposed Development”, Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Arklow Bank Wind Park 2 (ABWP2) (The Project)	<p>Arklow Bank Wind Park 2 (ABWP2) (The Project) is the onshore and offshore infrastructure. This EIAR is being prepared for the Offshore Infrastructure. Consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operations Maintenance Facility (Planning Reference 211316) has been granted on 26th May 2022 and 20th July 2022, respectively.</p> <ul style="list-style-type: none"> • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the Maritime Area Consent. This is the subject of this EIAR and will be referred to as ‘the Proposed Development’ in the EIAR. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure: This relates to the onshore grid infrastructure for which planning permission has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Array Area	The Array Area is the area within the Proposed Development where the WTGs, the OSPs, and associated cables and foundations will be installed. These cables will comprise export, inter array and interconnector cabling.
Bathymetry	The measurement of water depth in oceans, seas and lakes.
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area where the export, inter array and interconnector cabling will be installed. This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
Environmental Impact Assessment (EIA)	An Environmental Impact Assessment (EIA) is a statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of

Term	Meaning
	the European Parliament and of the Council (EIA Directive) and the regulations transposing the EIA Directive (EIA Regulations).
Habitat	The environment that a plant or animal lives in.
Impact	Change that is caused by an action; for example, land clearing (action) during construction which results in habitat loss (impact).
Landfall	The area in which the offshore export cables make landfall and is the transitional area between the offshore cabling and the onshore cabling.
The Developer	Sure Partners Ltd.

Acronyms

Term	Meaning
AA	Appropriate Assessment
ABWP	Arklow Bank Wind Park
AFS	Anti Fouling System
BAS	Burial Assessment Study
BWM	Ballast Water Management
BWMP	Ballast Water Management Plan
BWMS	Ballast Water Management System
CBRA	Cable Burial Risk Assessment
CTV	Crew Transfer Vessel
DOT	Department of Transport
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EU	European Union
EVMP	Environmental Vessel Management Plan
FMMS	Fisheries Management and Mitigation Strategy
HACCP	Hazard Analysis and Critical Control Point
HWM	High Water Mark
IAS	Invasive Alien Species
INISMP	Invasive Non-Indigenous Species Management Plan

INIS	Invasive Non-Indigenous Species
INNS	Invasive Non-Native Species
ISI	Invasive Species Ireland
LAT	Lowest Astronomical Tide
MMMP	Marine Mammal Mitigation Plan
MPCP	Marine Pollution Contingency Plan
NBAP	National Biodiversity Action Plan
NBDC	National Biodiversity Data Centre
NNE	North-North-East
NMPF	National Marine Planning Framework
NPWS	National Parks & Wildlife Service
OSP	Offshore Substation Platform
PPE	Personal Protection Equipment
SSW	South-South-West
UK	United Kingdom
UXO	Unexploded Ordnance
WFD	Water Framework Directive
RWMP	Resource and Waste Management Plan
WTG	Wind Turbine Generator

Units

Unit	Description
km	Kilometres

1 Invasive Non-Indigenous Species Management Plan

1.1 Introduction

1.1.1 Background

1.1.1.1 This Invasive Non-Indigenous Species Management Plan (INISMP) has been prepared to support the Environmental Impact Assessment Report (EIAR) for the Arklow Bank Wind Park 2 Offshore Infrastructure (hereinafter referred to as ‘the Proposed Development’).

1.1.1.2 It should be noted that this plan will be updated and finalised prior to construction in accordance with any relevant planning conditions. The plan will also be updated prior to the operational and maintenance and decommissioning phases.

1.1.2 Purpose of this Invasive Alien Species Management Plan

1.1.2.1 There are a number of pieces of legislation and guidance relating to Invasive Non-Indigenous Species at a European (EU) and Irish level, these are detailed below.

1.1.2.2 The Invasive Alien Species Regulation (EU 1143/2014) which came into force in January 2015, requires action plans to control the introduction and spread of (Invasive Alien Species (IAS) (European Parliament, 2014). This regulation indirectly affects the Water Framework Directive (WFD) (Directive 2000/60/EC)¹ and the Marine Strategy Framework (Directive 2008/56/EC)², ensuring compliance and best practice, and aids in the protection of Irish waters.

1.1.2.3 The National Marine Planning Framework (NMPF) from the Department of Housing, Local Government and Heritage includes ‘Non-indigenous Species Policy 1’ which has an objective to reduce the risk of the introduction and/or spread of IAS (NMPF, 2021). To accord with the NMPF Policy, development proposals must demonstrate a risk management approach to prevent the introduction of and/or spread of IAS, particularly when: moving equipment and boats from one water body to another, and/or introducing structures suitable for settlement of non-indigenous species, or the spread of non-indigenous species known to exist within the area of the proposal (NMPF, 2021).

1.1.2.4 In July 2023 the International Maritime Organisation (IMO) adopted Resolution MEPC 378(80) “2023 Guidelines for the Control and Management of Ships’ Biofouling to Minimise the Transfer of Invasive Aquatic Species (IMO, 2023) which provides practical guidance on measures to minimise the risk of transferring IAS which may arise from shipping activities.

1.1.2.5 In January 2024, Ireland’s 4th National Biodiversity Action Plan (NBAP) (NPWS, 2023), for the period 2023-2030 was launched which aims to build upon the achievements of the previous plan and will continue to implement actions within the framework of five strategic objectives. Of relevance, Objective 2 includes a focus on invasive species, with the aim of Outcome 2G being that IAS are controlled and managed on an all-island basis to reduce the

¹ The WFD requires all European member states to aim for good chemical and ecological status (ecological status takes into account IAS present, which can reduce a waterbodies status).

² The Marine Strategy Framework Directive requires Member States to put in place measures to achieve good environmental status in their marine waters by 2020.

harmful impact they have on biodiversity, and measures are undertaken to tackle the introduction and spread of new IAS to the environment.

1.1.2.6 There are eight supporting actions for Objective 2:

- The National Parks and Wildlife Service (NPWS) will establish an IAS unit to expedite implementation of the legislative and policy framework, including specific resources for enforcement;
- NPWS, together with other relevant Departments and public bodies, will develop national plans to implement aspects of the EU IAS Regulation and relevant national legislation, as well as work on cooperative plans where there is an all-island or North-South aspect for IAS impacts;
- NPWS will introduce new national legislation to update existing legislation and give effect to aspects of the EU IAS Regulation 1143/2014, as well as assigning responsibilities for aquatic IAS;
- NPWS in collaboration with all relevant stakeholders will resource and implement on-the-ground actions to control, manage and where possible and feasible, eradicate occurrences of invasive alien species, including the removal of stands of invasive species from Protected Areas and National Parks;
- NPWS, National Biodiversity Data Centre (NBDC) and relevant partners will develop dedicated biosecurity protocols, standard operating procedures and guidelines for Government Departments;
- NPWS, NBDC and relevant partners will implement recommended measures arising from the 2021 EPA Report No.368 Prevention, Control and Eradication of Invasive Alien Species;
- NBDC will continue to produce Risk Assessments for potential invasive alien species;
- Ireland will accede to the International Convention for the Control and Management of Ships Ballast Water and Sediments, with the Department of Transport (DOT) enforcing the requirements aboard Irish flagged ships, in its role as a flag state and aboard foreign flagged ships in Irish ports under port state control. DOT will also participate in the Paris MOU's Concentrated Inspection Campaign on implementation of the Ballast Water Convention in 2025.

1.1.2.7 This approach should allow alignment with Global Diversity Framework target 6: "Eliminate, minimise, reduce and/or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent by 2030, and eradicating or controlling invasive alien species, especially in priority sites, such as islands".

1.1.2.8 This INISMP ensures compliance with relevant legislation and international commitments for the Proposed Development as outlined above.

1.1.2.9 The purpose of this INISMP is to ensure all procedures pertaining to marine works (including construction, operation, maintenance and decommissioning of subsea structures) and vessel operations follow best guidance, preventing and reducing the risk of possible spread or introduction of IAS into the waters of the Proposed Development. The method employed follows the GB Invasive Non-Native Species (INNS) Strategy (2023 to 2030) (GB INNS, 2023), although consideration has also been given to guidelines from Invasive Species Ireland (ISI, 2021), noting that these are for the aquaculture industry. The INNS Framework Strategy involves a three-tier approach:

- Prevention: Prevent all INNS (IAS) from entering the waterbody in question;

- Rapid response: Detection of IAS as early as possible, monitor and possible eradication of IAS present; and
- Control and containment: Should proliferation of IAS be too great for eradication, control and containment of populations will be required.

1.1.2.10 This INISMP focuses on “Prevention”, in line with the INNS Framework Strategy, with a view to avoiding ‘rapid response’ and ‘control and containment’ methods.

1.1.2.11 This INISMP will be updated prior to construction and will remain a ‘live’ document throughout the lifetime of the project, with periodic updates by the Contractor Environmental Manager during the construction phase and the SPL Environmental Manager during the operational and maintenance, and decommissioning phases of the project, as outlined within Section 1.3.7 (Evaluation and Review).

1.1.3 Document structure

1.1.3.1 The INISMP is structured as follows:

- Section 1.2: Project background and consents;
- Section 1.3: Roles and Responsibilities;
- Section 1.3: Summary of INISMP methodology;
- Section 1.4: The Proposed Development INISMP; and
- Section 1.5: Useful sources of information for the Proposed Development project management.

1.2 Project background and consents

1.2.1 Project characteristics

- 1.2.1.1 The Proposed Development is an offshore wind farm project situated on and around Arklow Bank in the Irish Sea, approximately 6 to 15 km to the east of Arklow in County Wicklow (see Figure 1.1). The offshore infrastructure is that which will be located seaward of the high water mark (HWM).
- 1.2.1.2 The Proposed Development will consist of the following key components which are assessed in the Environmental Impact Assessment Report (EIAR):
- Either 56 or 47 Wind Turbine Generators (WTGs) using monopiles foundations with each WTG comprising a tower section, nacelle and three rotor blades;
 - Two Offshore Substation Platforms (OSPs) using monopiles foundations;
 - A network of inter-array and inter-connector cabling;
 - Two offshore export cables within the Cable Corridor and Working Area; and
 - Scour protection and cable protection, where required.
- 1.2.1.3 The Array Area (i.e. the area in which the wind turbines, inter-array and interconnector cables and OSPs will be located) covers 63.4 km² (a rectangular block approximately 27 km long and 2.5 km wide). The Cable Corridor and Working Area extends from the Array Area to a Landfall approximately 4.5 km to the north of Arklow at Johnstown North (see Figure 1.1).
- 1.2.1.4 The WTGs will be connected to each other by a network of inter-array cables, which will also connect into the OSPs. The offshore export cables will transfer the electricity from the OSPs to shore, where they will connect to the onshore infrastructure.

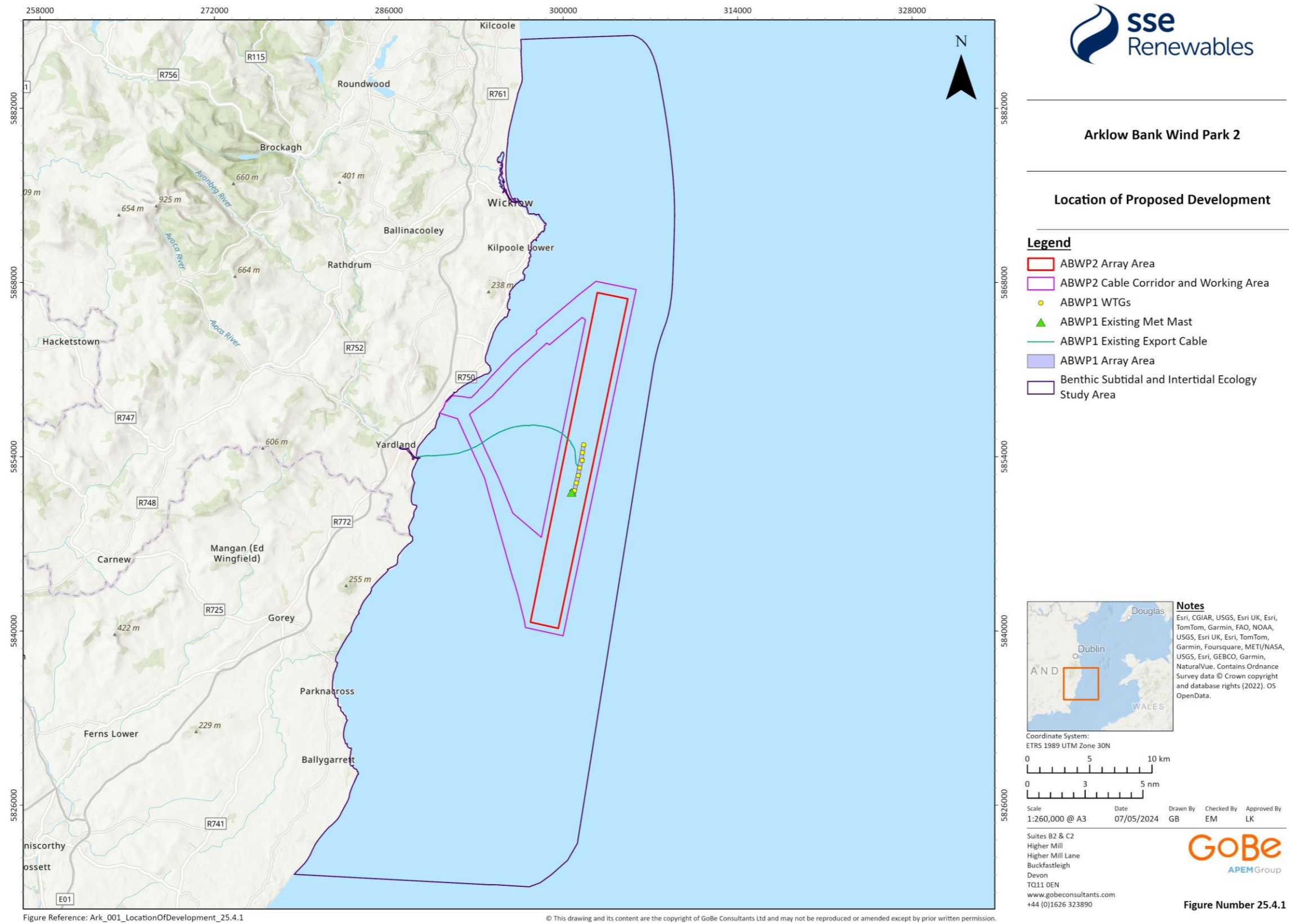


Figure 25.4.1: Location of the Proposed Development

1.2.2 Linkages with other consents management plans

1.2.2.1 The INISMP is consistent with other relevant consents management plans prepared to inform the implementation of the Proposed Development. These are set out in Table 25.4.1 below with details of the linkages presented.

Table 25.4.1: Linkages with other consents management plans

Consents Management Plan	Linkage with the INISMP
Marine Pollution Contingency Plan (Volume III, Appendix 25.1, Annex 2)	<p>A marine pollution contingency plan (MPCP) to address the risks of any spills and collision incidents associated with the Proposed Development in relation to all activities carried out below the High Water Mark (HWM) and outline methods and procedures to deal with them.</p> <p>Potential spill scenarios and control measures for the Proposed Development including information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance;</p>
Resource and Waste Management Plan (RWMP) (Volume III, Appendix 25.1, Annex 4)	Waste management and disposal arrangement
Vessel Management Plan (Volume III, Appendix 25.7)	A vessel management plan, to determine vessel routing to and from construction sites and ports
Fisheries Management and Mitigation Strategy (FMMS) (Volume III, Appendix 25.3)	The FMMS provides the strategy for engaging, consulting, liaising, communicating, and undertaking mitigation actions with respect to the fishing industry during the full lifecycle of the Proposed Development. The appointment and responsibilities of a company fisheries liaison officer is also set out in the FMMS.
Marine Mammal Mitigation Plan (MMMP) (Volume III, Appendix 25.2)	The MMMP provides the mitigation measures to minimise the impacts of Unexploded Ordnance (UXO) clearance and piling associated with the Proposed Development.
Environmental Vessel Management Plan (EVMP) (Volume III, Appendix 25.10)	<p>The objective of this EVMP document is to:</p> <ul style="list-style-type: none"> • Minimise the risk of collision and injury to marine wildlife; • Minimise the risk of disturbance to marine wildlife; • Prescribe measures to be implemented by contractors conducting activities on behalf of the Developer in proximity to wildlife; and • Provide contractors with the procedures for reporting vessel collisions with marine wildlife.

Cable Burial Risk Assessment (CBRA) (to be produced pre-construction)

The aim of the CBRA is to undertake a risk assessment in order to determine suitable burial depths for a cable along the entire route to protect the cable from third party and natural hazards. This includes identifying all hazards to the cable and carrying out a risk assessment to make recommendations on the burial depth required along the length of the cable to ensure that the risk to the cable is within acceptable limits. The CBRA includes an assessment of seabed conditions (based on available survey data) and an assessment of shipping, fishing, dredging, military activities etc. Burial requirements are normally driven by the risk from fishing gear and vessel anchors, as well as the seabed conditions along the cable route (which affects the anchor and fishing gear penetration depths).

This process will be informed by a Burial Assessment Study (BAS) which looks at the different installation methodologies available (Volume II, Chapter 4) and provides recommendations as to the suitability of each option based on the seabed conditions. The BAS also identifies areas where burial may not be feasible and additional protection (e.g. rock placement) may be required. This will feed into the CBRA to provide cable protection requirements (burial and external protection).

1.3 Roles and Responsibilities

1.3.1.1 A list of the roles and responsibilities in relation to this INISMP is provided in Table 25.4.2

Table 25.4.2: Roles and Responsibilities in Relation to the INISMP

Role	Responsibility
The Developer	Requiring the implementation of the INISMP and monitoring and/or clearance/disposal of IAS at the Proposed Development (via its Contractors and Subcontractors)
Environmental Clerk of Works (ECoW)	Quality assurance of the INISMP. Monitoring Contractor/Subcontractor compliance with the INISMP during all phases of the Proposed Development. Reporting any incidents with IAS.
Biosecurity Manager ³	Delegated responsibility for the practical implementation of the INISMP.

³ This role may be delegated to the Developer's Environmental Manager

Contractor and Subcontractor

Implementation of and adherence to INISMP and early notification of the presence of IAS to or via Biosecurity Manager.

1.4 Invasive Alien Species Management Plan Methodology

1.4.1.1 This section outlines the process of creating an INISMP following best practice guidance (Cook *et al.*, 2014) and information provided in the Invasive Species Ireland website (ISI, 2023). In order to make an accurate risk assessment of the Proposed Development and derive a suitable IASMP, a stepwise approach was taken as discussed in detail below.

1.4.1 Step 1: Understanding the site

1.4.1.1 As part of the development of the INISMP the following characteristics of the Proposed Development site were considered:

- Salinity of the site;
- The presence of any man-made structures; and
- Whether IAS are present within/on site.

1.4.1.2 Detailed descriptions of the environmental conditions affecting biosecurity are given section 1.5.

1.4.1.3 Understanding the salinity of the site will inform the likelihood of the presence of IAS. As salinity falls the less hospitable conditions become and the risk of IAS on site decreases as the majority of native and invasive marine flora and fauna are unable to tolerate low salinity (Evans, 1980); conversely a fully marine site represents a greater risk for the presence of IAS. Arklow harbour, where the OMF is situated, as well as marshalling harbours and construction support harbours, are also be considered when assessing areas that may already host IAS, or as areas that could be colonised.

1.4.1.4 The presence of artificial structures increases the risk of IAS colonisation, even if the structure has only been present for a few weeks, as IAS populations can establish rapidly.

1.4.1.5 If IAS have been found onsite, then the INISMP will focus on reducing the risk of introducing new IAS and consider how to prevent the spread of existing IAS to other sites. Here the precautionary principle will be followed, even if no IAS are present on site.

1.4.1.6 Using this information, a site can be assessed as having low risk or a significant risk of introducing or spreading IAS. Table 25.4.3 provides an example of this.

Table 25.4.3: Example of low and significant risk sites (Cook *et al.*, 2015).

Low Risk Site	Significant Risk Site
<ul style="list-style-type: none"> • Supply of freshwater from a local river • Isolated from surrounding environments by walls or breakwaters i.e. closed or semi-enclosed area with little to no flow of water. • Anti-fouling used on artificial structures with periodic removal for air-drying (every six to 12 months). 	<ul style="list-style-type: none"> • Full salinity with no freshwater inflow • Artificial structure has no antifouling coating with no management in place for maintenance and/or remaining submerged for longer than six months at a time. • There are fixed structures than can only be cleaned <i>in situ</i>.

1.4.2 Step 2: Understand how IAS may be introduced or spread to the site

- 1.4.2.1 In addition to understanding the site characteristics, any structures present and the existing presence of IAS, consideration of pathways by which IAS may be introduced or spread are needed. The step will be iterative and revisited when the INISMP is due for review. The questions and associated risk included in Table 25.4.4 have been adapted from Cook *et al.* (2014) and provide a list of the questions that were considered for the purpose of creating this INISMP.

Table 25.4.4: Questions considered for the purpose creating this INISMP (Cook *et al.*, 2015)

Question	Yes = High	Yes = Medium	Yes = Low
1. Is the vessel over 400 gross tonnes (gt), with a Ballast Water Management (BWM) Convention ⁴ compliant Ballast Water Management Plan, System and certificate?			Green
2. Is the vessel over 400 gross tonnes (gt), with an AFS Convention (2001) compliant Anti Fouling System and certificate?			Green
3. Has the vessel/ equipment just arrived from the local area?			Green
4. Has the vessel/ equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or time recommended by manufacturer)?			Green
5. Are all the visible submerged surfaces of vessels or equipment to be deployed free of bio-fouling (a green 'slime' is OK)?			Green
6. Do the visible submerged surfaces of vessels or equipment to be deployed have more than a green 'slime' coating?		Yellow	
7. Does the vessel or equipment to be deployed have noticeable clumps of algae and/ or animals clinging to the visible parts?	Red		
8. Has the vessel/ equipment just arrived from another country or region with similar environmental conditions (e.g., seawater temperature)?	Red		
9. Has the vessel/ equipment just arrived from a water body known to have IAS present?	Red		
10. Does the vessel/ equipment spend long periods of time stationary at sites in between anti-fouling treatments?	Red		
11. Is the vessel 'slow moving', such as a construction barge or drilling rig?	Red		

1.4.2.2 The greatest risk of introducing IAS to the site is when a vessel (particularly slow moving vessels), equipment or stock arrives at the site from another country, region or water body, with similar environmental conditions (e.g. seawater temperature and salinity) while it is

⁴ Seawater is used as ballast to stabilise steel-hulled ships at sea, contamination of water foreign to a location can result in the spread of IAS and therefore requires management to avoid this.

covered in biofouling (i.e. anything more than a thin, green 'slime' coating for vessel hulls) or contains additional algae or animals.

1.4.2.3 Another main risk is introducing IAS from the arrival of a vessel with biofouling on the hull, for example, which comes from a site known for the presence of IAS.

1.4.2.4 For the purposes of this assessment any activity that falls within the 'Low' category in Table 1.5 above is assessed as 'Low' Risk. Any activity that falls within the 'Medium' or 'High' categories is assessed as 'Significant' Risk. This is considered to present a conservative approach to assessing risk of introducing IAS.

1.4.3 Step 3: Understand the site activities which risk the introduction of IAS

1.4.3.1 The next step is to identify the main activities which take place at the site or as part of the operation/event, particularly those that could lead to the introduction and/or release of marine IAS at the site. Often this step involves a simple approach of listing all activities, using information obtained through the first two steps.

1.4.3.2 Many activities will pose negligible or no risk of introducing and/or releasing marine IAS, for example activities undertaken in areas remote from the marine environment and as such, are not required to be included in this plan. However, caution is advised when considering any activity carried out adjacent to the water and which may include both vessels and structures. Cook *et al.* (2014) provide a list of potential activities representing risk of introduction and/or releasing IAS. Of the potential activities relevant to offshore renewables, the following activities are applicable:

- use of construction barge and slow moving vessels;
- using vessels from locations outside local water body;
- removal of old structures/equipment;
- cleaning of hull and associated structures; and
- maintenance of equipment and vessels.

1.4.3.3 The two approaches that can be adopted when identifying activities are detailed below, although, as a rule, the in-depth approach (as detailed in 1.4.2.2) will be followed.

Simple Approach

1.4.3.4 This involves the listing of all the activities which take place on the site, or which make up the operation/event that may carry a significant risk of introduction and/or releasing IAS. This list is then referred to in Step 4 when developing control measures.

In-depth Approach

1.4.3.5 This approach increases the understanding of the risk associated with each activity of introducing and/or spreading IAS and also provides guidance on the development of biosecurity control measures and where and when to apply them. This approach has been developed from the Hazard Analysis and Critical Control Point (HACCP) and is further described in Annex B of Cook *et al.* (2014).

1.4.3.6 The in-depth approach involves five steps:

- Step 1 – List Site Activities: a list of all activities which have a potential risk of leading to the introduction of IAS is compiled.
- Step 2 – Describe Activities: a brief description of activities is provided based on “who, what, when, where, why and how”.
- Step 3 – Split Activities into Task: activities are subdivided into tasks, which are then briefly described.

- Step 4 - Establish Critical Control Points and Control Measures: the following is included for each task identified:
 - risk;
 - justification;
 - critical control point;
 - control measure; and
 - who will carry out the control measure.
- Step 5 – Develop an Action Plan: Based on the control measures developed in Step 4, an action plan is completed, setting out who will carry out the control measure, what they will do and when.

1.4.4 Step 4 – Biosecurity Control Measures

- 1.4.4.1 Once the project's activities are understood, identify the prevention measures undertaken to minimise the risk of introducing and/or spreading IAS. Initially this step involves a simple approach of listing all activities, using information obtained through the first two steps which will inform the identification and development of control measures which will be effective, simple, realistic and easily translatable into instructions to others.
- 1.4.4.2 The level of control the Applicant has over the site and its activities must be considered when developing measures and these will facilitate the Developer in meeting legal requirement to take appropriate steps to prevent the introduction of IAS (see section 1.1.2).
- 1.4.4.3 To ensure that control measures are appropriate a number of issues will be considered:
- who will be responsible for undertaking the action;
 - what actions will be employed to minimise the risk of introducing and/or releasing IAS;
 - where will control measure be applied; and
 - when will control measure be applied.
- 1.4.4.4 Cook *et al.* (2014) provide a list of example control measures many of which are included in the INISMP (see section 1.5.4). Biosecurity measures will be included in the design stage of a project so that potential risks of introducing and/or releasing IAS will be addressed at an early stage in the design process.

1.4.5 Step 5: Biosecurity Surveillance, Monitoring And Reporting Procedures

- 1.4.5.1 The early detection of IAS on a site is essential to facilitate their containment and potential eradication. Consequently, all staff and other site users will be encouraged to report any unusual sighting to the Developer.
- 1.4.5.2 This step outlines those procedures to be followed in the event of discovering and positively identifying an IAS on site. As part of this process the following will be implemented:
- identifying who is responsible for surveillance and monitoring of the site; and
 - adding actions to encourage vessel owners who use the site to be vigilant and report any sightings of concern.

1.4.6 Step 6: Contingency plan

- 1.4.6.1 In the event of the 'prevention' and 'rapid response' methods failing (section 1.1.2.7) a contingency plan will be created by the Developer and will be delivered to all relevant personnel, by appropriately qualified personnel, e.g. ECoW(s). This document will be short, provide a step-by-step approach and be accessible to all staff. This plan will review the

identified activities listed in the INISMP and derive actions based on the failure of the biosecurity control measures attributed to the listed activities e.g. a vessel has been wrongly assessed as low risk and has introduced an IAS to site. In this case, the species will be identified, sampled, relevant Authorities (NBDC - Invasive Species) notified by the Developer, and further containment measures sought. See the Invasive Alien Species in Ireland link in section 1.6 the IAS reporting system link.

1.4.7 Evaluation and review

- 1.4.7.1 Following completion of the INISMP, a clear recording system and review date will be put in place to accurately record the results of any checks or actions taken. Similarly, formal steps will be put in place to ensure that the biosecurity manager is informed of the potential introduction and/or release of IAS.
- 1.4.7.2 A programme for the review of site and operation plans will be drawn up to refine and update the INISMP as required.

1.5 Arklow Bank Wind Park 2 Invasive Alien Species Management Plan

1.5.1 Step 1: Understanding the site

Environmental conditions affecting biosecurity

- 1.5.1.1 The Proposed Development is located outside of any environmental designated areas.
- 1.5.1.2 Arklow Bank is a shallow offshore sandbank, with water depths varying between 0.6 m and 25 m relative to lowest astronomical tide (LAT). The tidal range at the Proposed Development site is influenced by the presence of a degenerate amphidromic point located in the eastern Irish coast at Courtown, resulting in a near-zero tidal range. The Arklow Bank is subject to very strong tidal currents with the general direction of flow in the offshore regions of the bank towards the north-north-east (NNE) during flood and towards south-south-west (SSW) during ebb. Spring tidal current speeds are in excess of 2 m/s towards the north end of the sandbank on both flood and ebb tides, whilst to the south the peak tidal currents are of the order of 1.7 m/s.
- 1.5.1.3 The Proposed Development is located in offshore waters and as such no freshwater inputs. Consequently, the salinity in the area is expected to be similar to that found in the wider Irish Sea.
- 1.5.1.4 The benthic subtidal and intertidal ecology characterisation of the Array Area and offshore Cable Corridor and Working Area showed habitats to be comprised primarily of sand with fine mud and were characterised as infralittoral mobile clean sand with sparse fauna. The current distribution of biotopes across the survey area, based on results of the 2021 survey (APEM, 2023), is consistent with previous site-specific surveys, including baseline surveys conducted in 2000 and 2001 (EcoServe, 2001). The communities recorded were typical of the sandbank habitat, having relatively low species diversity in comparison to surrounding area due to the dynamic nature of the environment.
- 1.5.1.5 With the exception of Arklow Bank Wind Park 1 (ABWP 1), which is comprised seven wind turbines, offshore export cable and inter-array cables, there are no man-made structures within the Proposed Development Array Area. However, there are other neighbouring wind farms currently at the planning stage which, if constructed, may increase the risk of IAS.
- 1.5.1.6 Information related to any slow or stationary periods or climatic condition that may increase biosecurity risk.

Information relating to the environmental conditions of the Proposed Development can be found in Volume II, Chapter 6 Coastal Processes, of the EIAR.

1.5.1.7 As described above, the Proposed Development area experiences strong tidal currents and is a dynamic sandbank system, which may reduce the biosecurity risk, as fouling organisms may find it more difficult to colonise introduced substrates.

IAS in the Arklow Bank

1.5.1.8 While a number of IAS are known to be present in waters around Ireland none were recorded during site specific surveys. However, additional confirmatory surveys for the Proposed Development are planned and should any IAS be recorded in the area prior to construction, the relevant information will be highlighted in this document, identifying the risk that each species represents to Ireland's native species.

1.5.1.9 All WFD water bodies within 20 km of the Proposed Development are currently classified as High from freedom from IAS.

1.5.2 Step 2: Understand how IAS may be introduced or spread to your site

Vessel/equipment to be used in the Proposed Development

1.5.2.1 Table 1.6 provides an example of the vessels and equipment to be used at the Proposed Development with a 'risk' indicator for the potential to introduce or spread IAS to the Arklow Bank area in the Irish Sea. This risk assessment will be updated prior to commencement of construction once the exact vessel and equipment details are confirmed, and will be based on professional judgement, the confirmed Project Design Option, IAS present within the area (see Section 1.5.1) and available guidance (See section 1.1).

1.5.2.2 Currently, in advance of construction contract tendering, the exact specifications of vessels and their origin are not available, and therefore a detailed update of Table 25.4.5 will be completed on appointment of preferred Contractor(s).

Table 25.4.5: Vessel and foundation types to be used in the Proposed Development and/or involved in the operation

Name	Type	Details & Risk factors assumptions	Risk: Low/Significant
Vessels (construction and decommissioning)	Various	<ul style="list-style-type: none"> Vessel types and sizes to be confirmed prior to construction, although expected to include jack-up barges/dynamic positioning vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels (CTVs), and scour/cable protection installation vessels; <p>Vessels for construction will be sourced from [Location TBC once this information becomes available];</p> <p>Vessels for decommissioning will be sourced from [Location TBC once this information becomes available];</p> <ul style="list-style-type: none"> Vessels will be required to have an anti-fouling coating and inspection history; All vessels will adopt guidance provided in "2023 Guidelines for the Control and 	

		<p>Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species" (IMO, 2023);</p> <ul style="list-style-type: none"> Vessels are expected to move slowly when installing or removing structures; and <p>Up to 66 vessels may be operating on site at any one time.</p>	
Vessels (operation and maintenance)	Various	<ul style="list-style-type: none"> Vessel types and sizes to be confirmed prior to construction, although expected to include jack-up barges/dynamic positioning vessels, tug/anchor handlers, cable installation vessels, guard vessels, survey vessels, crew transfer vessels (CTVs), and scour/cable protection installation vessels; Vessels for operation and maintenance will be sourced from [Location TBC once this information becomes available]; Vessels will be required to have an anti-fouling coating and inspection history; All vessels will adopt guidance provided in "2023 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species" (IMO, 2023); Vessels are expected to move slowly when installing or removing structures; and <p>Up to 22 vessels may be operating on site at any one time.</p>	
WTG and OSP foundations	monopile	<ul style="list-style-type: none"> 56 or 47 wind turbine foundations (monopile) 2 OSP foundations (monopile). <p>Total area of foundation including scour protection (WTG and OSPs): 288,400 m² (Project Design Option 1).</p> <ul style="list-style-type: none"> Foundation to occupy all of the water column. <p>Location and type of vessel transporting the foundation to site maintenance will be confirmed once this information becomes available</p>	

1.5.3 Step 3: Understand the site activities which risk the introduction of IAS

1.5.3.1 A list of the Proposed Development activities that may have a significant risk of introducing or spreading IAS is provided in Table 25.4.6. These will be derived from information in the final project design and from Step 2 (section 1.4.2), with these activities predicted to represent a significant risk of IAS introduction during the construction, operation and maintenance and decommissioning phases. The list of activities given in Table 25.4.6 will be reviewed and updated prior to commencing the construction, operational, decommissioning phases.

Table 25.4.6: Site activities which have a significant risk of introducing or spreading IAS

Phase	Activity Description
Construction	<p>Confirmatory geophysical surveys</p> <p>Installation of WTGs and associated foundations;</p> <p>Installation of OSP;</p> <p>Installation of offshore cables; and</p> <p>Transportation of components from locations that are already occupied by IAS, especially from outside the Irish State. - for example, those vessels involved with heavy transport, cable laying and rock dumping/anti-scour material installation.</p>
Operation and Maintenance	<p>Routine inspections;</p> <p>Geophysical surveys;</p> <p>Repairs and replacements (wind turbines, navigational equipment, J-tubes and consumables);</p> <p>Painting;</p> <p>Removal of marine growth;</p> <p>Cable repair and reburial; and</p> <p>Use of vessels that have come from areas already occupied by IAS (especially from outside the Irish State) involved with heavy lifting e.g. blade replacement.</p>
Decommissioning	<p>Decommissioning of WTG piles;</p> <p>Decommissioning of OSP piles; and</p> <p>Use of vessels that have come from areas already occupied by IAS, involved with heavy lifting, cable removal, anti-scour material removal.</p>

1.5.4 Step 4: Biosecurity control measures

1.5.4.1 This section provides information on site-specific risks and control measures associated with the Proposed Development.

Installation/presence of man-made structures

RISK

1.5.4.2 This may pose one of the greatest risks of IAS introduction or spreading associated with the Proposed Development. New or clean surfaces in ports, marinas and waterways are typically the first colonisation sites for IAS due to their ability to settle and rapidly proliferate. Newly available hard surfaces (e.g. foundations or scour/cable protection) associated with the Proposed Development may be susceptible to colonisation by IAS in the first few weeks/months after installation.

CONTROL MEASURES

1.5.4.3 Any man-made structure to be used for the Proposed Development will be of terrestrial origin (i.e. not coming from another marine environment where it has been submerged or exposed to the sea) or if it has come from another marine environment, it will be allowed to fully dry to kill off any organisms that have attached and will be inspected prior to placement in the marine

environment. These measures will be undertaken within the port or on transit vehicles (not sea going vessels).

- 1.5.4.4 Any man-made structures will be treated with anti-fouling paint and any marine growth will be removed (as detailed in paragraph 1.5.4.7 et seq.). All anti-fouling paint will be compliant with The International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), and the Sea Pollution (Control of Anti-Fouling Systems on Ships) Regulations 2008 (S.I. No. 82/2008).

Using vessels from outside of the Arklow Bank

RISK

- 1.5.4.5 Using vessels from outside the Irish Sea area poses a significant risk of introducing IAS to the area, especially vessels coming from areas of similar marine environment. Information on the origin of the vessels to be used in the Proposed Development will be included here once the exact specifications and origin of vessels are available, following appointment of construction contractors and prior to the commencement of construction (see paragraph 1.5.2.2).

CONTROL MEASURES

- 1.5.4.6 All vessels to be used for construction, operation and maintenance and decommissioning activities will be required to follow guidance as directed by the 'Guidelines for the control and management of ships biofouling to minimize the transfer of invasive aquatic species' (IMO, 2023), and where applicable, to comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments' (IMO, 2021).
- 1.5.4.7 Implementation of these measures will be ensured by a requirement for all contractors to comply with this INISMP by the Developer.

Cleaning and disposal of biofouling from structures during operation and maintenance activities and decommissioning

RISK

- 1.5.4.8 During routine maintenance (e.g. jet washing of marine growth from the splash zone), there is potential for IAS to be detached from subsea structures. The presence of any IAS will be detected during planned confirmatory surveys for the Proposed Development which will indicate risk of potential for colonisation, while surveillance and monitoring will confirm the presence of IAS on introduced infrastructure. Where there is an identified risk that these routine maintenance activities may lead to spread of IAS in the marine environment (e.g. where IAS have a high potential for colonisation of this part of the foundation or where IAS have been identified colonising turbines), additional control measures may be required.
- 1.5.4.9 Following removal of marine structures (e.g. WTG and OSP piles) during the decommissioning phase, IAS may still be attached to the surface. Should the IAS be removed without due care and washed back into Proposed Development marine environment, IAS may represent a risk of spreading to areas where they were not previously present.

CONTROL MEASURES

- 1.5.4.10 Large volumes of material detached or removed from decommissioned subsea infrastructure will be prevented from re-entering the marine environment, taken away and properly disposed of onshore.

1.5.4.11 Where there is an identified risk that operation and maintenance activities (e.g. periodic cleaning of foundations) may lead to spread of IAS (e.g. if there is a high risk that IAS are present on foundations as indicated by surveillance and monitoring or are known from the area as indicated by planned confirmatory surveys), control measures may be required to minimise the amount of material entering the marine environment:

- Material detached or removed from decommissioned subsea infrastructure will be transported to shore and disposed of appropriately onshore in order to prevent IAS entering the marine environment.
- All equipment, materials, machinery, Personal Protection Equipment (PPE) and vessels must be in a clean condition prior to their arrival on site.
- All control measures will be identified prior to any maintenance activities being undertaken.

1.5.4.12 All contractors will be required to comply with these measures by the Developer through adherence to this INISMP prior to mobilisation to site.

Biosecurity action

1.5.4.13 Prior to any installation/operation of new vessels or subsea structures to site, device developers and their contractors must include the following biosecurity clauses:

- The contractor must submit a Biosecurity Risk Assessment to the SPL Environmental Manager at least six weeks prior to installation/operations; and
- The contractor must ensure that all equipment, materials, machinery, PPE and vessels used are in a clean condition prior to their arrival on site to minimise the risk of IAS introduction into the marine environment.

1.5.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

1.5.5.1 This section will contain information outlining who is responsible for carrying out certain checks of IAS, as well as when and where these checks are to be completed by the Biosecurity Manager (Table 25.4.7).

Table 25.4.7: Instructions for checks of IAS

Who	What	Where	When
Biosecurity Manager Developer Contractors	<ul style="list-style-type: none"> • Oversee removal of flora and fauna from marine energy devices and ancillary equipment, ensure material is properly disposed of and that no material is released into the water as per Waste Management Plan. <p>Awareness of IAS, including identification guidance on the key risk species.</p>	At port	Beginning of works

Biosecurity Manager	<ul style="list-style-type: none"> Oversee installation and removal of marine energy devices and ancillary equipment, check for INNS or unknown organisms. For operation and maintenance, periodic checks should be carried out after 2 months to ensure no growth/settlement of IAS. Be aware of any slow moving or inactive craft and take steps to assess risk. <p>Ensure a Check, Clean and Dry message is sent to any new developers or contractors.</p>	At port	Throughout works
Developer			
Contractors			
Biosecurity Manager	<ul style="list-style-type: none"> Confirm origin of material used in constructing of marine energy devices and ancillary equipment <p>Encourage 'tool box' talks on IAS prevention and monitoring.</p>	n/a	Beginning of works
Developer			
Contractors			
Biosecurity Manager	Liaise with EPA and NPWS to identify any new IAS risks and thus potential mitigation requirements are well understood and enacted as soon as possible.	n/a	As required

1.5.6 Step 6: Contingency plan

1.5.6.1 Table 25.4.8 details the actions (stages) of the contingency plan and who is responsible for each of these actions. All actions should be undertaken as soon as practicable.

Table 25.4.8: Contingency Plan

Action	Responsibility
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Stage One – Suspected arrival of high alert species

Take photographs of sample and collect sample in a plastic bag. Contact EPA/NPWS for advice on where to send the sample.	Contractor Environmental Manager or the Developer's Environmental Manager/Environmental Clerk of Works (ECoW), depending on the phase of the project, or any member of staff.
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Check organism against identification sheet (see https://invasivespeciesireland.com/species-accounts/established/marine)	Contractor Environmental Manager or the Developer's Environmental Manager/ECoW, depending on the phase of the project..
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Report any sightings to Invasive Species Ireland:
<https://invasivespeciesireland.com/report-sighting>

Inform harbour users and place appropriate markers around the identified area	Harbour Master/staff
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Stage Two – Presence of high alert species confirmed

Initiate immediate containment measures, including restricted vessel movements.	Contractor Environmental Manager or the Developer's Environmental Manager, depending on the phase of the project, EPA/NPWS, Harbour Master
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Carry out wider survey of vessels and structures.	Qualified ecologist, EPA/NPWS, harbour staff
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Stage Three – Eradication/employ long-term control measures

Seek advice from Invasive Species Ireland and NPWS on appropriate measures and actions for long term control.	Contractor Environmental Manager or Developers Environmental Manager, depending on the phase of the project.
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1.5.7 Evaluation and review

Location of biosecurity logbook

- 1.5.7.1 A biosecurity logbook will be kept (electronic form) for the Proposed Development in which records of all checks and actions will be kept in addition to formal steps taken to inform the biosecurity manager of any potential issues relating to IAS.
- 1.5.7.2 Examples of information to be recorded in the logbook are provided in Cook *et al.* (2014). All records will be dated and signed by the biosecurity manager.
- 1.5.7.3 The logbook will be made available for inspection and reviewed as and when required.

Plan review date

- 1.5.7.4 This plan will be updated prior to construction, in accordance with any relevant planning condition. This will include all measures to manage IAS during the construction phase as agreed with the relevant regulatory authorities, i.e. Invasive Species Ireland and NPWS.

- 1.5.7.5 The plan will be updated following completion of construction and at the beginning of the operational and maintenance phase to ensure the plan is appropriate for the next phase of the development and risks/activities associated with it. The plan will be updated at regular intervals (and as a minimum every 5 years) during the operational and maintenance phase and prior to the decommissioning phase, to ensure all measures are appropriate and any changes in the environment and risk of IAS (e.g. records of IAS on site) are reflected in the INISMP, as agreed with the relevant regulatory authorities.

1.6 Useful Sources of Information

- 1.6.1.1 The following is a list of useful information sources which have been relied upon in the preparation of this INISMP:

- IMO Guidelines for the control and management of ships biofouling to minimize the transfer of invasive aquatic species (<https://www.imo.org/en/OurWork/Environment/Pages/Biofouling.aspx>);
- Invasive Alien Species in Ireland Home - Invasives.ie
- Invasive Species Ireland: (<https://invasivespeciesireland.com/biosecurity/aquaculture/guidelines/>);
- Invasive Species Ireland Species Accounts (<https://invasivespeciesireland.com/species-accounts/established/marine>);
- Marine Biosecurity Planning Guidance (Cook *et al.*, 2014): (<https://www.nature.scot/sites/default/files/2017-07/Publication%202014%20-%20SNH%20Commissioned%20Report%20748%20-%20Marine%20biosecurity%20planning%20-%20Identification%20of%20best%20practice%20-%20A%20review.pdf>);
- GB non-natives species secretariat (www.nonnativespecies.org); and
- GB non-natives species identification sheets (<https://www.nonnativespecies.org/non-native-species/information-portal/>).

1.7 References

- The International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) (2001)
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) (2004)
- APEM (2023). Appendix 9.1: Benthic Subtidal and Intertidal Ecology Technical Report.
- Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by Natural England and Natural Resources Wales (2015) Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales.
- EcoServe (2001). Volume 3, Appendix 15 of the Arklow Bank EIS. A marine ecological study of the Arklow Bank for a proposed offshore windpark development. Chapter 1. Baseline survey. April 2001.
- European Parliament (2014) Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species. Available at: Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (europa.eu)
- Evans, D. H. (1980). Osmotic and ionic regulation by freshwater and marine fishes. In Environmental physiology of fishes (pp. 93-122). Springer, Boston, MA.
- GB NNESS (2023). The Great Britain Invasive Non-Native Species Strategy 2023 to 2030. . Available from: <https://www.nonnativespecies.org/assets/Uploads/The-Great-Britain-Invasive-Non-Native-Species-Strategy-2023-to-2030-v2.pdf>
- GB NNESS (2008). The invasive non-native species framework strategy for Great Britain. Defra, London.
- IMO (2023). 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species. Available from: <https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.378%2880%29.pdf>
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- ISI (2021) Invasive Species Ireland. Available from: <https://invasivespeciesireland.com/biosecurity/aquaculture/guidelines/>
- ISI (2023) National Biodiversity Data Centre – Invasive Species Recording System :: Invasive species (biodiversityireland.ie)
- NMPF (2021) Project Ireland 2040: National Marine Planning Framework. Available at: <https://www.gov.ie/pdf/?file=https://assets.gov.ie/139100/f0984c45-5d63-4378-ab65-d7e8c3c34016.pdf#page=null> [accessed 05/04/2024].
- NPWS (2023) Ireland's 4th National Biodiversity Action Plan 2023–2030. Available at: <https://www.gov.ie/pdf/?file=https://assets.gov.ie/281711/d424b166-763b-4916-8eba-8aff955c5e5.pdf#page=null> [Accessed 05/04/2024]