

Appendix K

Management Plans





ORIEL WIND FARM PROJECT

Natura Impact Statement

Appendix K: Management Plans

MDR1520B
NIS – Appendix K
A1 C01
March 2024



Contents

5-1	Construction Environmental Management Plan
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Environmental Impact Assessment Report Appendix 5-1: Construction Environmental Management Plan

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Acronyms

Term	Meaning
AIS	Air Insulated Switchgear
BS	British Standard
CBM	Cement Bound Material
CEMP	Construction Environment Management Plan
CIRIA	Construction Industry Research and Information Association
CLO	Community Liaison Officer
CTMP	Construction Traffic Management Plan
DHLGH	Department of Housing, Local Government and Heritage
ECoW	Environmental Clerk of Works
EIAR	Environmental Impact Assessment Report
EIERP	Environmental Incident and Emergency Response Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
HSA	Health and Safety Authority
GGBS	Ground Granulated Blast Furnace Slag
GIS	Gas Insulated Switchgear
GNI	Gas Networks Ireland
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
HWM	High Water Mark
IAPS	Invasive Alien Plant Species
IEF	Important Ecological Feature
IEMA	Institute of Environmental Management and Assessment
IFI	Inland Fisheries Ireland
NIAH	National Inventory of Architectural Heritage
NIS	Natura Impact Statement
NMI	National Museum of Ireland
NMS	National Monuments Service
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
NSL	Noise Sensitive Location
OHL	Overhead Power Line
OSS	Offshore Substation
OWL	Oriel Windfarm Limited
pHNA	Proposed Natural Heritage Area
PPP	Pollution Prevention Plan
PPV	Peak Particle Velocity
RAMS	Risk Assessment Method Statements
RPS	Record of Protected Structures
SEAR	Safety and Environmental Awareness Report
TJB	Transition Joint Bay
TII	Transport Infrastructure Ireland
WMP	Waste Management Plan
WTG	Wind Turbine Generator

1. INTRODUCTION

1.1 Introduction

This document provides information relating to the environmental management during the construction of the onshore infrastructure of the Oriel Wind Farm Project, hereafter referred to as the Project. This document has been prepared to inform the Planning Authority, statutory consultees, and other project stakeholders of the proposed management methods to be employed during the construction of the onshore infrastructure of the Project.

The principal objective of this document is to detail appropriate measures in the avoidance, minimisation and control of adverse environmental impacts associated with construction of the onshore infrastructure of the Project. Furthermore, this document defines good practice as well as detailing specific commitments relating to environmental protection as identified in the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS) and a future version of this document will detail any planning conditions associated with a future planning consent, when they are known.

The Construction Environmental Management Plan (CEMP) will form part of the Oriel Wind Farm Project Works Contract (hereafter, the Contract). The CEMP covers all construction activities above the High Water Mark (HWM). The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by the Contractor in developing construction method statements and other plans relating to environmental management as required by the Contract.

This version of the CEMP (Version 1.0) presents minimum environmental management requirements to be adhered to by the Contractor. This CEMP will be updated following receipt of planning consent to incorporate relevant planning conditions and further details on environmental management measures to be applied during the construction phase. The CEMP will be a key construction contract document, which will allow the Contractor to ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented. The CEMP is considered a live document and will be updated by the Contractor following appointment, prior to and during the works.

The Contractor will submit all relevant information as detailed in this document to the Employer for acceptance in accordance with the contract provisions. No construction works will commence prior to the Employer's acceptance. This document is to be read and implemented onsite, in conjunction with industry good practice, published guidance documents, and other documents referred to within the CEMP.

The Checklist included in appendix 0, provides the Contractor with a summary of the minimum information to be provided to the Employer pre-, during and post-construction.

This document is to be read in conjunction with the following documents:

- Oriel Wind Farm Project - EIAR (Volume 2A, 2B and 2C);
- Oriel Wind Farm Project - Report to Inform Screening for Appropriate Assessment;
- Oriel Wind Farm Project - NIS; and
- Planning consent.

An outline Commitments Register (version 1.0) has been prepared and is included in appendix 0. This register requires to be updated (on consent) to ensure a full list of all commitments made in the EIAR, commitments made during the consent application process and any all related planning conditions are included. Responsibilities and relevant documentation for approval will also need to be assigned.

1.2 Scope

The remit of the CEMP is for the Project activities taking place landward of the HWM. The CEMP is applicable to all OWL personnel, contractors and subcontractors carrying out construction and operational and maintenance activities associated with the Project. The CEMP does not apply to the Oriel Wind Farm Project offshore infrastructure (i.e. seaward of the HWM). A separate Environmental Management Plan (EMP) has been developed for these elements of the Project (see appendix 5-2: Environmental Management Plan).

2. PROJECT DESCRIPTION

The Project is an offshore wind farm project situated off the coast of County Louth to the east of Dundalk Bay approximately 22 km east of Dundalk town centre, 18 km east of Blackrock, 5 km south of the Cooley Peninsula and 10 km northeast of Dunany Point. It comprises 25 Wind Turbine Generators (WTGs), one offshore substation (OSS), a single offshore cable which will extend from the offshore wind farm area to a landfall approximately 700 m to the south of Dunany Point, and a network of inter-array cabling. The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula.

The single offshore cable is joined to three onshore cables within an underground Transition Joint Bay (TJB) close to the landfall. The onshore cables will be installed within a single trench in an onshore cable route that connects the TJB to the substation site at Stickillin, east of Ardee on the N33. The onshore cable route is principally along the public road except when the onshore cables are required to pass under obstructions such as the River Dee or M1 motorway as described in section 2.2. The length of the onshore cable route, is approximately 20.1 km.

This CEMP will detail the appropriate measures to construct the onshore infrastructure, which comprises of the three elements as outlined in sections 2.1 to 2.3. Section 2.4 provides information on the temporary construction activities and programme.

2.1 Landfall

The offshore cable will make landfall approximately 700 m south of Dunany Point, Co. Louth, where it will be connected to the onshore cables within an underground TJB. The location for the TJB is dependent on cable and soil properties and therefore two options for the location of the TJB above the HWM close to the eastern end of the lane along the southern boundary of Dunany Demesne are proposed.

2.2 The onshore cable route

The onshore cables will be installed within a single trench in an onshore cable route that connects the TJB to the substation site at Stickillin, east of Ardee on the N33.

The route is approximately 20.1 km in length in a trench of approximately 1 m width and is principally located along public roads. The onshore cable will connect into a new onshore substation located below the existing 220 kV overhead power line (OHL) from Louth to Woodlands.

The route commences at the laneway that runs along the southern boundary of Dunany Demesne and follows local roads heading south through the townlands of Mitchelstown and Port before heading westwards on local roads through Boycetown, Togher and Clonmore. At Keenan's Cross, it continues westwards through Tullydonnell before heading northwards through Corstown.

The onshore cable route then crosses under the River Dee at Drumcar Bridge and continues along local roads, heading in a westerly direction. At Mullincross, the onshore cable route crosses the R132, and then at Charleville the route passes under the M1 motorway and Dublin to Belfast Rail Line. It then follows the N33 and crosses under the River Dee for a second time before continuing westwards to tie-in to the existing overhead line in the townland of Stickillin.

The onshore cables will pass through drilled ducts under the River Dee (two crossings), the Port Stream, Salterstown Stream and the M1 motorway and Dublin to Belfast rail line. At these locations the onshore cable route diverts to agricultural fields adjacent to the road from where the ducts are drilled, and the onshore cable installation undertaken. This installation is described in detail within the EIAR in chapter 5: Project Description.

2.3 The onshore substation

The onshore substation site will be located in an agricultural field in the townland of Stickillin, Co. Louth. The field has an existing access from the N33 national road which services the field and existing agricultural buildings. It is located approximately 3 km east of the town of Ardee, County Louth. The existing 220 kV overhead line from Louth to Woodland passes from north to south over the field.

The site for the substation compounds is approximately 3 ha in area and is located to the east of the existing overhead line. The substation site will occupy approximately 1/3 of the existing agricultural field.

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The onshore substation will consist of two compounds: Compound 1 will contain Gas Insulated Switchgear (GIS) located inside a building which is connected to the existing 220kV overhead line. Compound 2 will contain outdoor Air Insulated Switchgear (AIS) and will form part of the offshore grid.

Two new Line Cable Interface Masts will be constructed in order to connect the existing overhead power lines to the transmission cables from the GIS substation in Compound 1. These new pylon masts will replace an existing pylon mast adjacent to the substation compounds.

2.4 Construction phase

2.4.1 Temporary construction compounds

The Project will comprise seven construction compounds along the onshore cable route. Table 2-1 provides a summary of the activities that will be carried out at each of the compound locations. The construction compound at the site of the proposed onshore substation will incorporate the following provisions: site offices, stores, delivery and offloading areas, welfare facilities, parking areas and security accommodation. All Horizontal Directional Drilling (HDD) compounds will incorporate the following provisions: delivery and offloading area for the HDD equipment and goods, welfare facilities and parking for worker vehicles.

Table 2-1: Temporary construction compounds and proposed activities.

No.	Temporary construction compound location	Proposed activities	New temporary access required
1	Onshore substation site	Storage	No
2	River Dee at Richardstown	HDD Compound	West – Yes East – No
3	M1/Railway	Storage and HDD compound	West – Yes East – No
4	River Dee at Drumcar	HDD Compound	West – No East – Yes
5	Adjacent to JB17	Storage	Yes
6	Port Stream at Togher	HDD Compound	West – Yes East – Yes
7	Landfall	Storage	Yes

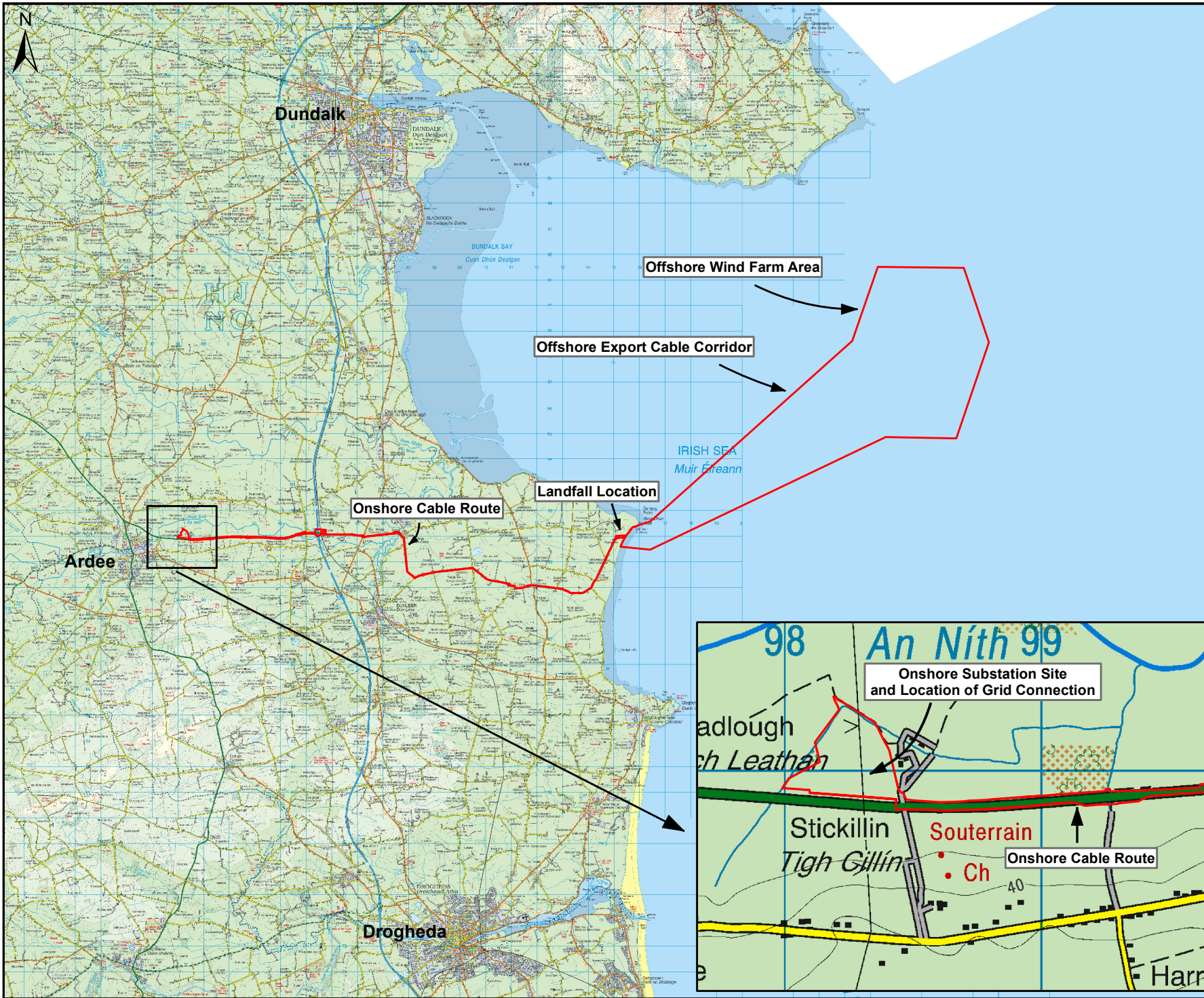
2.4.2 Construction programme

The construction programme is presented in Figure 2-1 and shows the indicative construction sequence and phases for both the onshore and offshore infrastructure for the Project. The timelines shown are indicative.

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Year		Year 1 - 2025				Year 2 - 2026				Year 3 - 2027				Year 4 - 2028			
Quarter		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
No.	Offshore Infrastructure																
1	Foundations Installation																
2	Offshore Substation Installation																
3	Offshore Export Cables Installation																
4	Inter-Array Cables Installation																
5	WTG Installation																
No.	Onshore Substation																
1	Site Preparation																
2	Civil Construction																
3	Electrical Installation																
4	OHL Loop-in Works																
5	Substation Energisation																
No.	Onshore Cable Installation																
1	Trenching and Ducting																
2	Landfall Installation																
3	Cable Pulling and Cable Jointing																
4	Passing Bay and Joint Bay reinstatements																

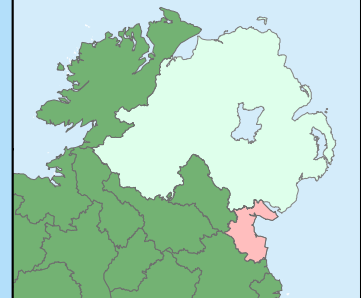
Figure 2-1: Indicative construction programme for the Project.



Legend

— Planning Application Boundary

Data Sources: OWL, OSI.



Client



Project

Oriel Wind Farm Project

**Figure 1-1:
Overview of Oriel Wind Farm
Project**

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Issue Details

Drawn By: MV	Project No. MDR1520b
Checked By: CC	File Ref:
Approved By: CC	MDR1520bArc3072P01
Scale: 1:200,000 @ A4	Projection: ITM (IRENET95)
Date: 19/04/2023	Geographic Co-ordinates: ETRS89

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3. RESPONSIBILITIES; CORRESPONDENCE AND GENERAL COMMUNICATION

3.1 Roles and responsibilities – All

A project Contacts Sheet (Table 3-1) provides a list of all Employer, Contractor, and relevant third-party contact details. The Contractor updates this sheet and keeps it current for the duration of the Contract. Table 3-2 provides a summary of the main construction phase tasks and responsibilities of contractor and employer personnel.

3.2 Roles and responsibilities - Employer

The Employer is responsible for ensuring that the Contractor manages the construction activities in accordance with this CEMP. The Employer's environmental policy is included in Annex A.2.

3.3 Roles and responsibilities – Contractor

The Contractor is responsible for implementing the CEMP including updating the document to reflect any changes in environmental management and/or practices. The Contractor will use the CEMP to inform all method statements and ensure that method statements include the controls and mitigation measures outlined in this document. The Contractor is responsible for ensuring all necessary consents, licences and permissions for all activities as required by current legislation governing the protection of the environment have been obtained. The Contractor will consult with the ECoW and Project Archaeologist as relevant regarding any derogation licence or archaeological monitoring licence applications.

The Contractor considers the mitigation measures and good practice construction methods detailed within this document in the Contractor's design and in any detailed environmental plans as required by the Contract.

Where the Contractor has standard documents within its own Environmental Management System or Environmental Management Plan (EMP), that cover a particular requirement of this CEMP, they will either be inserted or cross-referenced within the relevant section of the final CEMP.

The Contractor ensures that the Environmental Clerk of Works (ECoW) is informed in a timely manner of all site activities, including all programme changes, to ensure advanced checks and monitoring can be arranged. This includes any preliminary works.

To ensure compliance of the works with this document and pollution prevention requirements set out in section 5, the Employer and the ECoW regularly monitor the Contractor's works. Should the Employer or ECoW identify any failure to comply with the requirements of this document or the Contractor's own method statements the Employer or ECoW may stop the associated works (via instruction to the Contractor's Project Manager) until such time as the failure is rectified. Any associated cost or time delay incurred will be borne by the Contractor.

The requirement to temporarily suspend aspects of the works can be enforced by the Contractor, the ECoW or the Employer.

3.4 Contractor's Environmental Manager

The Contractor employs an Environmental Manager with appropriate experience and expertise for the duration of the construction phase to ensure that all the environmental design, control and mitigation measures outlined in the CEMP/EIAR and supporting planning documentation in relation to all aspects of the environment are implemented. The Environmental Manager together with an environmental team and in consultation with the ECoW, will be responsible for implementation of all mitigation measures and monitoring. This Environmental Manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects to occur.

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3.5 Environmental Clerk of Works (ECoW)

The Employer appoints an appropriately qualified and competent environmentalist or ecologist as ECoW to manage and ensure Contractor compliance with this CEMP.

The ECoW will have a minimum of five years of relevant site experience. The ECoW will be appointed in a full-time capacity for the construction phase. The ECoW will supervise works onsite as required by the construction programme and construction activities with ecological constraints (e.g. HDD crossings). For ECoW powers in relation to halting works refer to section 3.3.

The ECoW will be responsible for training and engagement with site staff in relation to good environmental practices prior to and during the construction works. The ECoW will also carry out any relevant tasks relating to environmental monitoring and good practice prior to and during the construction works. Fundamentally, the ECoW will be responsible for:

- Monitoring and maintaining temporary drainage systems in accordance with the CEMP, including the direction of civils works team to implement, bolster and remediate (as necessary) water pollution prevention measures as detailed in section 5;
- Monitoring implementing habitat and species protection measures in accordance with the CEMP, including pre-construction surveys;
- Developing a positive environmental culture via training and engagement with site management and, importantly, site operatives to increase awareness and promote timely remediation / reporting; and
- Communicating statutory requirements and good environmental practices outlined in the CEMP, principally via a schedule of toolbox talks informed by site activities and recorded non-compliance.

3.6 Geotechnical engineer

The Contractor employs a geotechnical engineer to monitor the construction works as required, ensuring, for example, that excavations, and material stockpiles are managed in an appropriate manner as required by the contract (including this CEMP).

3.7 Community Liaison Officer

The Community Liaison Officer (CLO) will be appointed by the Contractor and will be responsible for managing tasks such as the following:

- Alerting neighbouring residents of the works or activities commencing in their area;
- Briefing neighbours on progress and issues likely to affect them, such as traffic management measures, as necessary;
- Liaison with Louth County Council and emergency services as appropriate; and
- Liaison with local Gardaí, particularly in relation to traffic movements and permits where necessary.

3.8 Community Engagement Manager

The Community Engagement Manager is employed by the Employer. The dedicated role is in place right through the Project phases to facilitate engagement with the community. The Community Engagement Manager will work closely with the CLO.

3.9 Archaeologist (onshore)

An archaeologist will be appointed by the Employer to undertake a programme of archaeological testing/surveys as required in advance of construction (see section 5.11) and provide advice throughout the construction phase as appropriate.

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3.10 Ecologist

An ecologist will be appointed by the Employer to undertake pre-construction surveys in advance of construction (see section 5.5) and provide advice throughout the construction phase as appropriate.

3.11 Correspondence, records and reporting

The Contractor provides a complete record of all relevant communication and reports associated with all aspects of environmental management and implementation of this document. The following records will be maintained:

- Minutes and attendance records of start-up meetings (onsite meeting prior to commencement of construction works). Attendance required by Employer, Contractor, ECoW and all other relevant personnel responsible for environmental management during the Project;
- Weekly rolling Environmental Risk Log – including look ahead activities with required mitigation (including weather forecasts), discussed and recorded at scheduled weekly construction meetings. This will cover all environmental sensitivities, including ecology, archaeology, and water quality/drainage mitigation locations/measures;
- Employers and Contractor Audit Reports (according to respective corporate procedures);
- Waste Management Records;
- Water Quality Monitoring Records, documenting the Contractor's visual checks of waterbodies;
- Licences and Consents - copies of all permissions, consents, licenses, and permits, including related correspondence; and
- General Correspondence - all other relevant internal and external communication records relating to environmental management issues and implementation of the CEMP.

3.12 Site induction

The Contractor ensures that all Contractor employees, sub-contractors, suppliers, and other visitors to the site are made aware of the content of this document that is applicable to them. Accordingly, environmental specific induction training will be prepared and presented to all categories of personnel working and visiting the site. As a minimum, the following information will be provided to all inductees:

- Identification of specific environmental risks associated with the work to be undertaken onsite by the inductee;
- Summary of the main environmental aspects of concern at the site:
 - a. Nearby sensitive receptors such as residences, schools, etc.;
 - b. Species and/or habitat protection requirements;
 - c. Archaeological features for protection;
 - d. Pollution prevention and protection of the water environment (e.g., silt mitigation measures and refuelling);
 - e. Measures to minimise impacts on air quality;
 - f. Resource and waste management (e.g. requirements for storage and removal of hazardous material);
 - g. Construction traffic management; and
 - h. Plant service and repair procedures, specifically service location and the disposal of waste oils and service components.
- Environmental Incident and Emergency Response Plan (EIERP); and
- Contact details for the ECoW.

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The Contractor will provide an Environmental Risk Map illustrating environmentally sensitive areas and potential sources of pollution (e.g. refuelling areas, location of spill kits, fuel tanks etc.). The Environmental Risk Map will be used during the induction and prominently displayed in the compound areas. In consultation with the ECoW, the Contractor updates the map as required. Any update will trigger a toolbox talk to clearly communicate the change and offer opportunity for any necessary clarifications.

3.13 Training and toolbox talks

During construction, to provide on-going reinforcement and awareness training, the above topics as outlined in section 3.12, along with any other environmental issues which arise onsite, will be discussed at regular toolbox talks.

Toolbox talks and training will be delivered by specialist personnel onsite (e.g., ECoW) as required.

The Contractor submits a schedule for toolbox talks at least one week prior to commencement of works. The proposed schedule – to be considered as a live document - will be consistent with the programme of works. Additional toolbox talks will be added as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc.

Specifically, the Contractor provides, as a minimum, the following environmental training by competent staff/sub-contractors:

- Training on the use of spill kits (on ground and in surface waters), to be provided on a regular basis (to account for staff/sub-contractor changes etc); and
- Training on silt mitigation (e.g., installation of silt fencing etc.), silt mitigation measures to relevant construction / site staff.

Other toolbox talk topics will include but are not necessarily limited to the following:

- Material handling, including excavation, segregation, storage, and reuse/disposal of excavated materials;
- Groundwater and surface water, including managing surface water ingress into excavations, dewatering excavations, managing pumped water, and identifying and treating contaminated groundwater or surface water;
- Waste management, including waste storage, waste segregation and littering;
- Control of fuel and refuelling, and fuel handling procedures;
- Surface water run-off, drainage control and silt mitigation; and
- Ecologically and archaeologically sensitive areas.

The Contractor maintains records of all toolbox talks and training and makes these records available to the Employer if requested.

3.14 Environmental audits

The Contractor undertakes a programme of monthly environmental audits, including audits of all sub-contractors, on a quarterly basis and provides an audit report to the Employer within two weeks of the audit being undertaken.

Environmental audits may be completed at any time by the Employer, but at least one per quarter. The Contractor maintains a record of all completed audit forms, and records of corrective action and close outs.

The Contractor undertakes environmental inspections on a daily and weekly basis (refer to individual sections) and provides relevant records to the Employer when and as requested.

3.15 Risk assessment and method statements

The Contractor provides Risk Assessments and Method Statements (RAMS) for all works and tasks prior to these being undertaken. These documents will consider and address all the environmental aspects of the planned works and will include proposed mitigation measures and will be provided to the ECoW at least one week in advance of such works starting.

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A list of all works and activities will be scheduled prior to the commencement of works and will be kept updated to include any additional tasks during the construction phase.

3.16 Notice boards

The Contractor provides and maintains project environmental notice board(s) which are positioned to ensure that all construction employees including sub-contractors can review the notice board daily. As a minimum this will include one notice board at the main site compound at the onshore substation site.

Environmental labelling and signage will be used onsite to inform project personnel of key environmental requirements or restrictions, including information to assist good environmental practice across the Project.

The environmental notice boards are maintained by the Contractor and will be reviewed, and updated as required, at least weekly. As a minimum, the notice boards contain:

- Description of the key environmental risks and intended risk mitigation measures, together with accompanying Environmental Risk Map illustrating the location of the key risks and required exclusion zones / buffer zones and location of emergency response equipment; and
- Key contact numbers and responsible personnel identified within the EIERP (see section 5.2).

3.17 Review and change management

The CEMP will be regularly reviewed during the construction phase. The Contractor's Environmental Manager will assume responsibility for the CEMP during construction. Any refinement to the CEMP, made by the Contractor, must be circulated to the OWL Environmental Manager for review and approval. The CEMP will be reviewed every three months or when any significant new information, methods, procedures or good practice becomes available. The CEMP will also be updated in response to any findings or lessons learned during the construction phase.

A change management procedure will be followed by the Contractor's Environmental Manager in the event of a new environmental sensitivity being identified (e.g. which may be highlighted by ongoing monitoring surveys or in the event of a new environmentally designated area being proposed) during construction. Such a procedure is recommended in the IEMA Practitioner Guide (IEMA, 2008). Following notification of a change, the Contractor's Environmental Manager will initiate a process of assessment of potential impacts and, if necessary, update the CEMP. The Contractor's Environmental Manager will maintain a record of changes and the review process. The updated CEMP will be submitted to the competent authority for approval.

ORIEL WIND FARM PROJECT- CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Table 3-1: Contacts sheet.

(Table to be completed by *Employer* and *Contractor* prior to commencement. This table will be updated and kept current by the Contractor for the duration of the Contract).

Company	Position	Name	Tel / mobile no.	Email address
Oriel Windfarm Limited	Project Manager	TBC	TBC	TBC
Oriel Windfarm Limited	Construction Manager	TBC	TBC	TBC
Oriel Windfarm Limited	Environmental Manager	TBC	TBC	TBC
Oriel Windfarm Limited	Site Supervisor	TBC	TBC	TBC
Oriel Windfarm Limited	Community Engagement Manager	TBC	TBC	TBC
Oriel Windfarm Limited	OWL Civil Engineer	TBC	TBC	TBC
Oriel Windfarm Limited	Environmental Clerk of Works (ECoW)	TBC	TBC	TBC
<i>Contractor – tbc</i>	Contractor's Project Manager	TBC	TBC	TBC
<i>Contractor – tbc</i>	Site Agent	TBC	TBC	TBC
<i>Contractor – tbc</i>	Foreman	TBC	TBC	TBC
<i>Contractor – tbc</i>	Environmental Manager	TBC	TBC	TBC
<i>Contractor – tbc</i>	Geotechnical Engineer	TBC	TBC	TBC
<i>Contractor – tbc</i>	Community Liaison Officer	TBC	TBC	TBC
<i>TBC</i>	Specialist Ecological Consultant	TBC	TBC	TBC
<i>TBC</i>	Archaeological Consultant	TBC	TBC	TBC
Louth County Council		TBC	TBC	TBC
National Parks and Wildlife Service (NPWS)		TBC	TBC	TBC
Inland Fisheries Ireland (IFI)		TBC	TBC	TBC
Specialist Emergency Contractor (specify)	TBC	TBC	TBC	TBC

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Table 3-2: Main tasks and responsibilities - construction phase.

Task	Contractor									Employer					Visitor
	Project Manager	Site Agent	Site Foreman	Environmental Manager	Geotechnical Engineer	Waste manager	Community Liaison Officer	Specialist Ecological Consultant	Specialists Archaeologist	Project Manager	Construction Manager	Community Engagement Manager	Site Supervisor	ECoW	
Provide information (in accordance with contractual timelines)	<input checked="" type="checkbox"/>														
Start Up Meeting	✓	x	x	x	x	x	x	(x)	x	<input checked="" type="checkbox"/>	✓	x	x	x	
Site Inductions	<input checked="" type="checkbox"/>	✓	x	✓	x	✓		x	x	(x)	x		(x)	✓	x
Obtaining relevant permissions, consents, licenses, and permits	✓			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>								✓	
Weekly progress meetings including Contractor, Employer, Geotechnical Engineer, Environmental Specialist/Manager/Engineer) updates/issues	<input checked="" type="checkbox"/>	x	(x)	✓	(x)	✓	(x)	(x)	(x)	(x)	x	(x)	✓	✓	
Monthly or weekly Environmental Log / Report														<input checked="" type="checkbox"/>	
Liaison with regulator / statutory consultees	<input checked="" type="checkbox"/>			✓							✓			✓	
Liaison with neighbours, Garda, and Louth County Council							<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>			
Environmental checks and monitoring (e.g. dust, oils and chemicals storage, drainage mitigation, plant etc.)	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓			✓			✓		✓	<input checked="" type="checkbox"/>	
Environmental analysis		✓		<input checked="" type="checkbox"/>										✓	
Waste Management checks and monitoring and analysis and record keeping	✓	✓	✓	✓		<input checked="" type="checkbox"/>							✓	✓	
Environmental audits / inspections	✓			<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>	
Ecological inspections and monitoring and compliance checks	✓	✓	✓					<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	
Record keeping (e.g., waste documentation, licences, training, incidents, mitigation designs, material, waste, and risk registers etc)	<input checked="" type="checkbox"/>			✓	✓	✓		✓		<input checked="" type="checkbox"/>	✓		✓	<input checked="" type="checkbox"/>	
Archaeological monitoring / inspections	✓								<input checked="" type="checkbox"/>						
Communicating environmental observations and suggested improvements	<input checked="" type="checkbox"/>			✓		✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

KEY:

-
- ✓
- x
- (x)

Note:

Lead / Responsible (may apply to several roles)
 Provide support (may apply to several roles)
 Attend / take action (may apply to several roles)
 Optional / as required

This table details main tasks / responsibilities. Following agreement between the *Employer and the Contractor*, tasks/responsibilities may be re-assigned.

4. COMMUNITY LIAISON

4.1 Community liaison

OWL recognises the importance of effective community liaison to ensure public safety and welfare during the works, to reduce nuisance to residents and the local community, and to help ensure the smooth running of construction activities. To this end, the requirements for community liaison have been set out below.

The purpose of this is to ensure good relations with the neighbouring community. The key aims include:

- Provide frequent and timely information to the public during the construction phase (particularly to nearby residents and building occupants);
- Provide the correct points of contact and be responsive to queries and complaints; and
- Ensure good housekeeping in all aspects of the operations on site to minimise nuisance.

The Contractor will take all reasonable steps to engage with stakeholders in the local community, focusing on those who may be affected by the construction works including nearby residents, schools, businesses, community resources and specific vulnerable groups.

Communication with the local community, with Louth County Council and other relevant stakeholders will be undertaken at an appropriate level and frequency throughout construction. The Employer appointed Community Engagement Manager will be involved throughout and will work with the Contractors CLO on all aspects of community engagement. Where communications are related to environmental issues, the Environmental Manager will be involved, if appropriate.

A significant part of community liaison is the ‘good neighbour’ policy. Key aspects of this policy include:

- Implementation of the policy from the commencement of construction;
- Providing a point of contact for queries and complaints;
- Minimising causes of nuisance;
- Maintaining access to neighbouring premises;
- Clear and concise information distributed widely and updated frequently; and
- Undertaking timely liaison with stakeholders.

With regard to liaison, the Contractor will be required to provide the details of how the local community, road users and affected residents will be notified in advance of the scheduling of major works, the temporary traffic diversions and the progress of the construction works.

Details of the available communication channels/points of contact for members of the public to contact the project team during construction will be established in advance of the commencement of construction and displayed around working areas. The Contractor’s communication details will include the following:

- Contractor’s community relations policy;
- Personnel nominated to manage community relations;
- A methodology for processing and recording observations, queries and complaints from the public, relevant authorities, the media, and emergency services; and
- The strategy for project-wide liaison with all relevant parties.

The contact details for the CLO will be posted on all construction site notice boards and on any other information or correspondence, which may be distributed from time to time.

4.2 Advance notice of works

The Contractor will ensure that residents, businesses, occupiers, general users of the area and stakeholders are informed in advance of construction activities that may affect them. The Contractor’s detailed procedures and the responsible personnel will be identified in the CEMP when it is updated by the Contractor prior to construction.

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All notifications will detail the nature of the works, estimated duration and working hours. All notifications will include a project-specific contact number to which any enquires can be directed. The Contractor will be responsible for preparing and issuing the notifications subject to the relevant approval and consents.

4.3 Enquiries and complaints

The Contractor will establish a process for handling all enquires including complaints. All enquires will be recorded and a log will be maintained to include details of the response and action taken. The log will be available for inspection if requested by Louth County Council. All observations, queries and complaints will be dealt with in a timely manner.

The Employer, including the Community Engagement Manager, Environmental Manager and ECoW will be immediately informed of any environmental-related issues that have been raised. The Contractor's Environmental Manager will be responsible for informing Louth County Council, relevant stakeholders, and statutory bodies, as appropriate, about such issues.

5. GENERAL SITE MANAGEMENT AND POLLUTION PREVENTION

5.1 General site management and pollution prevention

5.1.1 Responsibility

The Contractor is responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls are deemed to be adequate and appropriately constructed.

The Contractor ensures that all staff and subcontractors working on site will be familiar with pollution prevention and mitigation measures as detailed in this document. This includes subcontractors, Employer's direct contractors and other Employer's representatives working on the site.

It is the responsibility of the Contractor to contact the relevant statutory and non-statutory bodies and stakeholders in the vicinity of the Project, so that the requirements and interests of these parties are adhered to and protected throughout the duration of the Contract.

Prior to works commencing on site, the Contractor will prepare a Pollution Prevention Plan (PPP) in line with the below requirements (as a minimum) and will communicate the contents to all staff (induction / toolbox talks). The PPP covers all potentially polluting activities, considering good practice standards. The Contractor provides the PPP to the Employer prior to start of works on site.

The Contractor monitors, and records in an onsite log, adherence to the PPP throughout the works. The Contractor communicates the PPP and any changes/updates of the PPP to all personnel on site.

5.1.2 Good housekeeping and general pollution prevention measures

The Contractor will ensure "good housekeeping" at all times. The following points (not exhaustive) indicate general pollution prevention measures in accordance with published guidance and project commitments. Pollution prevention measures relating to specific tasks are also detailed in the respective sections of this document. This will include, but not necessarily be limited to, the following measures:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. and maintaining dust suppression;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing, and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the Contractor will take appropriate action to eliminate and prevent further occurrence;
- Maintenance of wheel washing or other similar systems and other contaminant measures as required in each working area;

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- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Prohibition of open fires always;
- Use of less intrusive noise alarms, which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access;
- All loading and unloading of vehicles will take place off the public network wherever this is practicable; and
- Material handling and/or stockpiling of materials, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

5.1.3 Hours of work

It is proposed that core working hours will apply as follows:

- Monday to Saturday (inclusive) - 8:00am to 6:00pm; and
- Sunday and Bank Holidays - no operations and no associated lighting other than that required for security or safety.

Specific activities such as large concrete pours or delivery of large equipment (e.g. transformers) which require specific road control may occur outside these hours. Consent would be sought from the local authority and affected local stakeholders informed prior to these activities.

It may also be necessary, for example, due to weather constraints, specialist subcontractor availability or the nature of the activity, to undertake certain activities outside of the core working hours. Any construction outside of the core working hours will be agreed by the Contractor in advance with Louth County Council and scheduling of such works will have regard to nearby sensitive receptors, who will be notified in advance.

In the case of work outside of the core working hours required in an emergency or which if not completed would result in an unsafe or harmful situation for workers, the public or local environment, Louth County Council will be informed as soon as reasonably practicable of the reasons and likely duration and timing.

The removal of waste material off site by road and regular deliveries to site will, where appropriate, be generally confined to outside of peak traffic hours, and will only be undertaken by appropriately permitted hauliers and disposed of in appropriately permitted facilities.

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shut down activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. Except as noted above, the use of plant or machinery likely to cause disturbance will not be permitted outside of the core working hours.

5.1.4 Site security

The security of the works areas will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or exit from any working areas. The following measures may be used to prevent unauthorised access:

- Installation CCTV and alarm systems where required;
- CCTV and security systems will be sited and directed so that they do not intrude into occupied residential properties;
- Provision of adequate security guards and patrols;
- When there is no activity on site, site gates will be closed and locked and appropriate site security provisions will be undertaken;
- Consultation with neighbouring properties and local crime prevention officers including Louth County Council and An Garda Síochána on site security matters as required; and

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- Prevention of access to restricted areas and neighbouring properties by securing equipment on site such as scaffolding and ladders.

5.1.5 Hoarding and fencing

The following measures will be applied in relation to hoarding and fencing:

- Construction compounds will be secured by fencing and provided with lockable gates to prevent unwanted access to temporary compounds and working areas;
- Appropriate sight lines/visibility splays will be maintained around accesses to temporary compounds and working areas from the public road to ensure safety of both vehicles and pedestrians is preserved;
- Temporary Heras fencing will be used in certain areas, such as for short term occupation of working areas;
- Display information boards will be provided with out of hours contact details, a telephone helpline number for comments/complaints and information on the works; and
- Notices to warn of hazards on site such as deep excavations, construction access will be installed on site boundaries.

5.1.6 Services and lighting

Working areas will be powered preferably by mains supplies and by diesel generators where an electrical supply is not available.

The Employer will require the Contractor to put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider.

Lighting – site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads, and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed so that it does not unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor cause distraction or confusion to motorists.

5.1.7 Energy management

The contractor will be required to implement measures to manage energy usage. Measures will include but are not limited to:

- The use of thermostatic controls on all space heating systems in site buildings to maintain optimum comfort at minimum energy use;
- The use of sensors on light fittings in all site buildings and low energy lighting systems;
- The use of adequately insulated temporary building structures for construction compounds fitted with suitable vents;
- The use of low energy equipment and 'power saving' functions on all PCs and monitors in the site offices;
- The use of low flow showers and tap fittings; and
- The use of solar/thermal power to heat water for the on-site welfare facilities and contamination unit (sinks and showers).

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The contractor will also be required to measure and record all activity data (fuel use, material use, transport, etc.) to allow for the development of a carbon footprint for the construction phase of the Project.

5.1.8 Temporary construction compounds

Welfare Facilities - welfare facilities will be provided, as appropriate, for construction staff and site personnel including locker rooms, drying rooms, toilets, and showers. The welfare facilities will be located at the temporary construction compounds and works areas.

Drinking Water - potable water will be supplied from Irish Water mains where available. If not, potable water will be either transported via tanker to site or via large bottles. Typically, one delivery each week will be required for the provision of potable water.

Grey Water - grey water for non-drinking purposes (construction and toilets) will be sourced via rainfall collection or transported via tanker to site.

Wastewater - sanitary wastewater will be collected and stored on site in holding tanks, which will be emptied on a regular basis by licensed contractors and disposed of appropriately.

Wheel wash or similar- where a wheel wash is installed, this will be located on impermeable surface, and water will be passed through a silt buster or other appropriate surface water management mechanism.

Deliveries to site - deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required at the working areas. Storage of material will be at the supplier premises or at the temporary construction compound, depending on the type of material.

Works requiring multiple vehicle deliveries, such as concrete pours, will be planned to ensure queuing on the public roads around the working areas will be avoided as far as is practical.

5.1.9 Reinstatement of working areas on completion

The Contractor will reinstate all road verges and other areas as work proceeds during construction. All plant, equipment, materials, temporary infrastructure, and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition.

The proposed temporary construction compounds will be levelled and regraded with new surfacing to comprise a free draining granular hardcore.

5.1.10 Management of fuels and oils

The Contractor will prepare and adhere to a Fuel Management Protocol in line with the below requirements (as a minimum) and communicate the contents to all staff (via induction / toolbox talks).

The Contractor will provide secure oil, fuel, and chemical storage in over-ground bunded areas, limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas.

The Contractor will ensure protection measures will be put in place to ensure that all hydrocarbons used are appropriately handled, stored and disposed of in accordance with the TII/NRA document "CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001) and Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016).

Emergency spill kits will be retained onsite at sensitive locations (e.g. next to water courses such as the river Dee), with portable kits provided to plant and equipment operators. A detailed spillage procedure, as part of the EIERP, will be put in place and all staff on site will be trained with respect to the relevant procedures to be undertaken in the event of the release of any sediment, hydrocarbons into a watercourse. In the event of spillage of any polluting substance and/or pollution of a watercourse, Louth County Council, Inland Fisheries Ireland (IFI) and the NPWS will be notified by the Contractor. A set of standardised emergency response procedures will govern the management of emergency incidents, see reference to the EIERP in section 5.2. A specialised Emergency Contractor will be appointed prior to construction, with contact detail provided in the EIERP.

The Contractor ensures that:

- Fuel and oil containers are stored within a secondary containment system (e.g., bund to 110% of volume for static tanks or a drip tray for mobile stores);

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- Ancillary equipment such as hoses, pipes are contained within the bund;
- Fuel and oil stores including tanks and drums are regularly inspected for leaks and signs of damage;
- Only designated trained operators are authorised to refuel plant on site; and
- Procedures and contingency plans are set up to deal with emergency accidents or spills.

All ancillary fuel pipes on plant, outlets at fuel tanks etc. will be regularly checked and maintained to ensure their good state-of-repair and that no drips or leaks to ground occur. The following precautions will also be installed on fuel delivery pipes:

- Any flexible pipe or tap or valve must be fitted with a lock where it leaves the container and be locked when not in use;
- Flexible delivery pipes must be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Any leaking oil from ancillary pipework must be held within secondary containment;
- The pump or valve must have a lock and be locked when not in use; and
- Warning notices including “No smoking” and “Close valves when not in use” will also be displayed.

Irrespective of the location of refuelling onsite, interceptor drip trays (or similar, e.g., plant nappies, open metal drip trays are not acceptable) will be available and used during all refuelling operations. Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water. Plant and site vehicles are to be well maintained and any vehicles leaking fluids must be repaired or removed from site immediately. Any servicing operations will take place over drip trays.

Plant, site vehicles and machinery will be checked daily and are to be well-maintained. Any machinery leaking fluids must be repaired or removed from site immediately. Any servicing operations will take place over interceptor drip trays and will not take place at the site (unless servicing is required at the point of breakdown).

The Contractor identifies a specialist clean-up specialist emergency contractor to engage with in the case of a significant pollution event on site. Details of the specialist contractor will be provided to the Employer prior to works commencing on site. Details of the specialist contractor will be included in the EIERP (section 5.2).

5.1.11 Noise and vibration

Construction activities may give rise to significant noise impacts if not carefully managed. This is particularly the case where activities overlap, and particularly noisy activities need to be completed in close proximity to sensitive receptors. Construction scheduling will be planned to minimise any overlap and carefully control activities when being carried out close to Noise Sensitive Locations (NSL).

BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites outlines a range of measures which have now become standard good practice measures that can be used to reduce the impact of construction phase noise and vibration on the nearest NSLs. These measures will be applied by the Contractor where appropriate during the construction phase of the Project.

Construction at the landfall; onshore cable; and onshore substation site

No construction at the onshore substation site or the onshore cable route will be carried out at night, with the possible exception of abnormal load deliveries to the substation site. Where necessary, mitigation measures will be employed to limit noise within the BS 5228 thresholds. As a minimum the following measures will be adopted and included in the CEMP:

- The contractor will employ a competent acoustician to:
 - Review the operation of the CEMP; and
 - Advise on appropriate noise and vibration monitoring arrangements as required by the local authority.
- The CEMP will specify the use of low noise equipment where practicable;

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- Where noise barriers are required for specific activities to limit noise emissions, barriers will be specified by a competent professional who will provide drawings showing the location and a specification of minimum performance for the barriers:
 - Flexible absorptive noise barriers designed for control of construction noise are readily available and can be mounted on heras fencing or similar. Commercially available examples include EchoBarrier, NoiseBreak and Outdoor Sound Curtains; and
 - Standard construction site hoarding functions as an effective noise barrier where it blocks line of site to noisy activity.
- The use of particularly noisy handheld tools such as pneumatic drills may require the use of a site enclosure such as outlined in BS 5228 (2009).

Noise control measures will be employed in each of the construction phases. Standard operating procedures will include many general measures that can reduce noise levels at source such as:

- Avoid unnecessary revving of engines and switch off equipment when not required;
- Keep internal haul routes well maintained and avoid steep gradients;
- Use rubber linings in, for example, chutes and dumpers to reduce impact noise;
- Minimize drop height of materials;
- Start-up plant and vehicles sequentially rather than all together. The movement of plant onto and around the sites should have regard to the normal operating hours of the sites and the location of any NSLs as far as is reasonably practicable; and
- The use of conventional tonal audible reversing alarms has caused problems on some sites and alternatives are available such as white noise reversing alarms. Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites.

Landfall location

No significant effects have been predicted for construction noise at the landfall location, there may however be requirements to locate heavy loads or work to tidal constraints at the landfall location which necessitate night-time works for limited periods. Where such work is required, it will be the subject of an approval process and controls to keep construction noise within thresholds will be adopted.

There are a small number of NSLs in the vicinity of the landfall location and keeping residents well informed of works is of importance. The nearest NSL to the landfall excavation is a holiday home and it should be ensured that regular correspondence with the owner is maintained, and notice given of any disruption or noisy activities so that they can plan accordingly if appropriate.

If use of a rock breaker is required for durations of an hour or more, a temporary acoustic enclosure will be erected around the breaker head.

Onshore cable route

The assessment indicates that noise levels from linear trench construction will not result in significant effects. If site conditions make the use of a rock breaker necessary at fixed positions within 40 m of a residential façade, a temporary acoustic enclosure will be erected around the breaker head.

Noise control measures will be employed where necessary along the route to ensure that there are no significant effects due to noise from trenching activities.

The assessment indicates that noise levels at facades more distant than 40 m from joint bay construction activity will not result in significant effects. If site conditions make use of a rock breaker necessary at the following joint bays, a temporary acoustic enclosure will be erected around the breaker head:

- Joint Bay 12 – NSL façade within 20 m;
- Joint Bay 13 – NSL façade within 30 m;

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- Joint Bay 14 – NSL façade within 20 m;
- Joint Bay 15 – NSL façade within 40 m;
- Joint Bay 16 – NSL façade within 30 m;
- Joint Bay 18 – NSL façade within 40 m;
- Joint Bay 19 – NSL façade within 40 m;
- Joint Bay 20 – NSL façade within 40 m;
- Joint Bay 21 – NSL façade within 20 m;
- Joint Bay 22 – NSL façade within 20 m;
- Joint Bay 23 – NSL façade within 30 m;
- Joint Bay 24 – NSL façade within 40 m;
- Joint Bay 25 – NSL façade within 40 m; and
- Joint Bay 28 – NSL façade within 20 m.

Noise control measures will be employed where necessary to ensure that there are no significant effects due to noise from joint bay construction.

Four HDD sites have been identified where proximity of NSLs may result in significant effects due to HDD noise, these are:

- Port Stream tributary at Clonmore (open trench preferred);
- Port Stream at Togher; and
- Salterstown Stream.

Temporary noise barriers will be employed at these sites to avoid significant effects. The barriers should be placed as close as practicable to the noisiest equipment and must block line of sight to the nearest NSLs.

Vibration impacts to NSLs from onshore cable construction

Vibration Peak Particle Velocities (PPVs) of 2 to 3 mm/s are predicted for rock breaking if required on the onshore cable route adjacent to the nearest NSLs. BS 5228-2 indicates that these levels will cause complaints in residential environments but can be tolerated if prior warning and explanation is given to residents.

A one to one stakeholder engagement process will be put in place for the duration of the construction phase, including the provision of information to local residents regarding works likely to cause significant noise or vibration and/or works planned to take place outside of core working hours and also establish a process for handling all enquires including complaints. Responsibility for communicating details of construction activities will be assigned to a CLO who will act as a single point of contact with secondary responsibility assigned appropriately to account for any absences.

5.1.12 Dust

The following mitigation measures (as outlined in chapter 23: Air Quality of the EIAR) will be implemented by the Contractor to minimise dust:

- Temporary site roads will be regularly cleaned and maintained as appropriate. Hard surface roads (public and site) will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only;
- Any temporary site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions (also applies to vehicles delivering material with dust potential);
- All vehicles exiting the works will make use of a wheel wash facility (or similar) prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Wheel washes will be self-contained systems that do not require discharge of the wastewater to water bodies;

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- Public roads outside the works will be regularly inspected for cleanliness, and cleaned as necessary;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- All vehicles which present a risk of spillage of materials, while either delivering or removing materials, will be loaded in such a way as to prevent spillage on to the public road;
- The Contractor will be required to ensure that all vehicles are suitably maintained to ensure that emissions of engine generated pollutants is kept to a minimum; and
- The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction for comparison with the guideline of 350 mg/m²/day (for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations including sensitive receptors along the route and at the site compounds. Where dust levels are measured to be above this guideline the mitigation measures in the area will be reviewed as part of the dust minimisation plan.

5.1.13 Surface water management

The contractor will be required to implement the following surface water management measures prior to commencing construction and decommissioning works on site, in accordance with Best Practice Guidance for the storage of oil BPGCS005 – Oil Storage Guidelines (Enterprise Ireland, nd), and CIRIA guidance (Report No.113 titled “Control of groundwater for temporary works” (CIRIA, 1986)). The mitigation measures will include and are not limited to the following (as outlined in chapter 22: Hydrology and Flood Risk):

Principal Avoidance Measures:

- Site clearance involving topsoil stripping will progress along with the earthworks and will not be carried out over large areas in advance of the works;
- Working areas will be kept as small as possible;
- Material deposition areas are to be designed to avoid sediment entering adjacent watercourses and minimize water quality impacts on waterbodies;
- Excavation works at proximity (10 m buffer zone) to surface waters to be kept to a minimum where possible; and
- Suspend work in advance of extreme weather forecasts.

Principal Control Measures:

- Site compounds/storage facilities will be located at least 10 m away from surface waters. In addition, measures will be implemented to ensure that silt laden or contaminated surface water runoff from compound(s) do not discharge directly to the surface waters. Compounds will not be constructed in lands at risk of flooding;
- All soiled construction runoff water will be passed through settlement ponds/ silt traps and/ or bunds prior to outfall to the receiving surface water where appropriate;
- Management of material deposition areas to prevent siltation of watercourse systems through runoff during rainstorms. It is recommended to construct collector ditches surrounding material stockpiles to contain runoff and direct it to the settlement ponds/ silt traps before discharge to an adjacent watercourse;
- Wheel wash facilities to be appropriately located to ensure wash waters are intercepted, contained and directed to settlement ponds/ silt traps prior to discharge to surface waters; and
- Ensure run-off generated from dewatering activities for discharge to surface waters is treated utilizing temporary settlement pond/tanks(s) in accordance with CIRIA Report No.113 titled “Control of groundwater for temporary works” (CIRIA, 1986).

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Surface water monitoring

Excavation works at close proximity to the watercourses particularly at watercourse crossings has the potential to reduce water quality due to increased sediments discharge and accidental spillage.

Water quality sampling will be undertaken prior to construction and decommissioning in order to update the baseline, and on bimonthly basis at the onshore substation and cable crossing locations when rainfall results in any discharge from the site or from a control structure. If oils and grease are visually evident, a sample will be forwarded to an accredited laboratory for analysis.

Monthly sampling will be adequate during times when there is no rainfall/site discharge.

Water Quality Sampling to be undertaken using hand-held water probes to measure the following: pH, turbidity, dissolved oxygen, Total Dissolved Solids (TDS), and temperature. Biological water quality sampling will also be paired with daily visual/sensory observations for water quality characteristics including: algae growth, presence of foam, turbidity, colour, presence of oil, and odour.

5.1.14 Accidental spills

The contractor will implement the following management measures prior to commencing construction and decommissioning works/activities on site. The contractor will adopt best practice measures in accordance with best practice guidance.

Principal Avoidance Measures:

- The storage and handling of oils, fuel, chemicals and hydraulic fluids will be in secure areas within the site compounds and will not occur within a minimum of 10 m from watercourses; and
- Storage of fuels, chemicals and lubricants at the contractor's compound must be fenced off and have a lockable gate to prevent unauthorized access or vandalism.

Principal Control Measures:

- Foul drainage from all site offices and construction facilities will be taken off-site and disposed of by a licensed contractor;
- Protection measures will be put in place to ensure that all hydrocarbons used during the construction phase are appropriately handled, stored and disposed of in accordance with National Roads Authority (NRA) guidance "*Guidelines for the crossing of watercourses during the construction of National Road Schemes*" (NRA, 2008). All chemical and fuel filling locations will be protected from potential spillages through the provision of appropriate protection measures including bunded areas and double skinned bowser units with spill kits;
- Storage tanks will have secondary containment provided by means of an above ground bund to capture any oil leakage. Storage tanks and associated provision, including bunds, will conform to the current best practice for oil storage and will be undertaken in accordance with Best Practice Guide BPGCS005 – Oil Storage Guidelines (Enterprise Ireland, nd);
- Where required, the pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents will be completed in the dry and allowed cure for 48 hours in order to avoid pollution of watercourses;
- The use and management of concrete in or close to watercourses will be carefully controlled to avoid spillage. Alternate construction methods are encouraged for example, use of pre-cast concrete or permanent formwork will reduce the amount of in-situ concreting required. Where on-site batching is proposed by the contractor, this activity will be carried away from watercourses (minimum 10 m). Washout from such mixing plant and from concrete delivery trucks will be carried out only in a designated contained impermeable area;
- An Environmental Incident and Emergency Response Plan (EIERP) detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous wastes (e.g. concrete) to be in place prior by the contractor to commencement of the Project;
- Relevant staff, including cover staff, shall be trained in the implementation of the EIERP and the use of any spill kit/ control equipment as necessary. The contractor shall provide a list of all such staff to the

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Employer's Site Representative detailing the name, contact number, and training received, and the date of that training; and

- Plant and equipment shall be maintained in place and in working order for the duration of the works.

5.2 Environmental incident and emergency response

5.2.1 General requirements

The Contractor will prepare a detailed EIERP. The EIERP contains details of emergency scenarios and relevant procedures and actions that will apply.

The Contractor will communicate the EIERP as part of the site induction to all staff and visitors.

The Contractor will ensure the EIERP contains contact details of relevant staff / external authorities such as:

- Environmental Protection Agency (EPA) and EPA 24-hour emergency incident line 1890 33 55 99
- Specialist clean-up contractor;
- Emergency Services;
- IFI;
- Local Authority Environmental Officers;
- An Garda Síochána;
- National Parks and Wildlife Services; and
- The Coast Guard.

5.2.2 Safety and Environmental Awareness Reports (SEAR) and Environmental Auditing

The Contractor will complete a Safety and Environmental Awareness Report (SEAR) for all potential (near miss) or actual environmental incident or emergency which occurs on site.

5.2.3 Pollution/spill incident

The Contractor will provide a one-page summary sheet containing the key information for incidents response to be used as a quick reference for any on-site personnel witnessing an incident. A laminate copy of this summary sheet will be located with all plant / machinery / on-site vehicles. Key information to be provided to the Project Manager and the ECoW within 30 minutes of an incident (irrespective of the scale / severity of the incident) will include:

- What substance was spilled (Material Data Safety Sheet);
- Approximate volume and time of spillage;
- Accurate location of spill (GPS/grid reference or ID/number referenced on map etc.);
- All measures taken to clean up the spill;
- Help required (i.e., manpower, machinery, expert advice, disposal, etc.); and
- Whether the spill has reached a watercourse or the marine environment.

The Contractor in updating the EIERP, will consider the impacts of pollution/spill incidents during construction and will note the actions to be taken in the event of a pollution incident, including the following:

- Containment measures;
- Emergency discharge routes;
- List of appropriate equipment and clean-up materials;
- Maintenance schedule for equipment;

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- Details of trained staff, location, and provision for 24-hour cover;
- Details of staff responsibilities;
- Notification procedures to inform the relevant environmental protection authority;
- Audit and review schedule;
- Telephone number of Uisce Éireann; and
- List of specialist pollution clean-up companies and their telephone numbers.

The Contractor will ensure that adequate means to absorb or contain any spillages of chemicals, pollutants are available at all times.

5.2.4 Emergency access

The Contractor will be required to maintain access routes for the emergency services in all work areas for the duration of the construction phase and to identify the emergency site access points to each work area.

These will be developed in consultation with the emergency services and documented by the Contractor, as part of the updated CEMP prior to construction commencing, as well as being identified in the updated EIERP.

5.2.5 Extreme weather events and flood risk

The Contractor will consider the impacts of extreme weather events, flood risk and related conditions during construction. The Contractor will be required to use the short to medium range weather forecasting service from Met Éireann, or other approved meteorological data and weather forecast provider, to inform short to medium term scheduling of the works, environmental controls, and mitigation measures.

The updated CEMP will include appropriate contingency measures to manage extreme weather events (red weather warnings from Met Éireann), including the suspension of work, where required. The measures will include training of personnel and prevention and monitoring arrangements for weather events. Where relevant risks have been identified, the detailed construction method statements will consider extreme weather events.

Works will not be carried out during extreme rainfall. Met Eireann provides a 5-day weather forecast via its website (www.met.ie). The Contractor shall monitor this and other appropriate weather forecasts on a regular basis, at least daily. The forecast maps total rainfall, averaged over six hours, in the following bands:

- < 2 mm/hr (denoted by blue and green shading);
- 2 to 3 mm/hr (denoted by yellow shading); 3 to 6 mm/hr (denoted by orange shading); and
- >6 mm/hr (denoted by red shading).

Measures to limit the generation of sediment-laden runoff are to be implemented by the Contractor, according to the following predicted rainfall bands:

Table 5-1: Measures to limit the generation of sediment-laden runoff

Category	Predicted Rainfall	Action
Red	>6 mm/hr	<ul style="list-style-type: none"> • Excavation works to be reviewed; • Stockpiled materials and excavations to be covered; and • Silt fences, check dams and other sediment control measures to be inspected hourly.
Orange	3 to 6 mm/hr	<ul style="list-style-type: none"> • The Contractor shall have regard to the existing ground conditions with respect to possible erosion of sediments, and halt excavation works if necessary; • Impermeable matting to be placed adjacent to stockpiled materials

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Category	Predicted Rainfall	Action
		and excavations for installation if the rainfall intensity increases; and
		<ul style="list-style-type: none"> Silt fences, check dams and other sediment control measures to be inspected hourly.
Blue, Green, Yellow	<3 mm / hr	<ul style="list-style-type: none"> Silt fences, check dams and other sediment control measures to be inspected hourly.

5.2.6 Fire and explosion risk

Even though the fire and explosion risk during construction are very low, the updated CEMP will include appropriate contingency measures to manage such risks. The measures will include training of personnel in fire and explosion risk awareness, risk prevention and risk monitoring. Portable fire extinguishers, suitable for the activities at the working area, checked and maintained in working order, will be available for use at each of the working areas. Potentially flammable or hazardous substances will be stored appropriately, and quantities stored will be limited to the minimum volume required to meet the immediate requirements.

Appropriate site personnel will be trained as first aiders and fire marshals. Monitoring of site activities to minimise fire and explosion risk will be a key part of the duties of the site safety officer and fire marshals.

5.3 Climate

The following measures (as outlined in chapter 17: Climate of the EIAR) will be implemented by the Contractor to avoid/minimise CO₂ emissions during the construction phase:

- Reducing the idle times by providing an efficient material handling plan that minimizes the waiting time for loads and unloads. Reducing idle times could save 10% of total emissions during construction phase;
- Turning off vehicular engines when not in use for more than five minutes. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and
- Regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they will perform the most efficiently.

The Contractor will be required to implement energy management measures for the duration of the works as outlined in section 5.1.7.

Materials with a reduced environmental impact will be incorporated into the construction design through re-use of materials or incorporation of recycled materials in place of conventional building materials. The following materials will be considered for the construction phase:

- Ground Granulated Blast Furnace Slag (GGBS) and Pulverised Fuel Ash – Used as replacements for Portland cements to increase sustainability and carbon footprint of civil and structural works; and
- Steel – The recovery rates associated with using recycled steel are high and research exists which shows that 99% of structural steel arising from demolition sites is recycled or re-used. The carbon emissions emitted during the production of virgin steel can be higher than some other structural materials on a tonne-by-tonne basis, and recycled steel should be used where possible.

The Contractor will also be required to measure and record all activity data (fuel use, material use, transport, etc.) to allow for the development of a carbon footprint for the construction phase of the Project.

5.4 Population and human health

The following measure (as outlined in chapter 18: Population and Human Health of the EIAR) will be implemented by the Contractor to reduce the potential for impacts on population and human health during the construction phase:

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- Implementation of the Construction Traffic Management Plan (CTMP) (see appendix 5-9: Construction Traffic Management Plan). This outlines measures to be followed in order to avoid, minimise or mitigate disruption to traffic in the surrounding area during the construction phase, specifically;
- In order to enhance the public health benefits of increased education and training and good quality employment, training and employment opportunities will be offered through a workforce management plan.

5.5 Biodiversity

The following measures (as outlined in chapter 19: Onshore Biodiversity of the EIAR) will be implemented by the Contractor to reduce the potential for impacts on biodiversity during the construction phase:

- Section 5.1 of this CEMP outlines measures to be followed in order to avoid, minimise or mitigate disruption to the environment and surrounding area during the construction phase, specifically;
- An Ecological Management Plan will be produced and implemented;
- A suitably qualified and experienced ecologist ('the ecologist') will be utilised in the implementation of the measures and survey requirements;
- For revegetation within the proposed Natural Heritage Area (pNHA), the profile of the sea cliffs will be reinstated. Existing vegetation will be retained before reprofiling and will be reinstated and allowed to regenerate after construction;
- A 10 m buffer zone from Dunany Point pNHA will be implemented on the landward side within the planning application boundary. The buffer zone will be physically demarcated using post and rail/post and rope/bunting, or equivalent, and be signposted to identify an ecological sensitivity. The ecologist will assess and verify the demarcation and signage before works commence. See EIAR appendix 19-1: Onshore Biodiversity – Supporting Information (section 19.4) for specific detailed measures;
- Timing of the works at the landfall location to avoid the peak season for intertidal birds (October to April, inclusive). Timing of vegetation removal works to avoid the bird nesting season (March to August, inclusive). Avoidance of light spill during night-time hours, and badger buffer zones between 30 m and 150 m depending on works type and season. See EIAR appendix 19-1: Onshore Biodiversity – Supporting Information, (section 19.4) for specific detailed measures; and
- Pre-construction surveys (complete protected and invasive species survey, including breeding bird assessment). See EIAR appendix 19-1: Onshore Biodiversity – Supporting Information (section 19.4) for specific detailed measures.

Disturbance measures

- Timing of landfall works (i.e. installation of the cable in the intertidal and shingle banks) will avoid peak season for intertidal birds (October to April, inclusive);
- Timing of HDD works will avoid the peak movements of fish (i.e. fish migration into rivers for spawning, and smolt emigration from the river to the sea) between March-May (smolt emigration) and June-August (return for spawning);
- Timing of works in the intertidal area (i.e. cable repair and reburial) will avoid peak season for intertidal birds (October to April, inclusive);
- The removal of existing hedgerow will avoid the bird nesting season (March to August, inclusive). See volume 2C appendix 19-1: Onshore Biodiversity – Supporting Information, section 19.4 for specific detailed measures;
- Any external lighting utilised to facilitate night-time working or security (i.e. at the onshore substation site, onshore cable route and landfall location) will be directional and cowled to avoid the light spill (above 1 LUX) to all relevant Important Ecological Features (IEFs);
- In the unlikely event that roosting or stranded bats are encountered on the Project, works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted. If present, bats will only be removed under licence from the NPWS; and
- All works within the disturbance range of identified badger setts will implement the following:

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- Prior to works commencing within the vicinity of any sett, all site personnel will be given a Toolbox talk where operatives will be briefed on the presence of the sett and the legal protection and exclusion buffer zones that badgers and setts are afforded;
- Any piling will take place at a distance greater than 150 m from identified badger setts;
- An exclusion buffer zone of 30 m will be maintained around the setts in the summer season (July to October, inclusive), extended to 50 m during the badger breeding season (November to June, inclusive);
- All overburden mounds will be sited at a minimum distance of 50 m from any identified sett;
- The buffer zones will be physically demarked using post and rail/post and rope/bunting, or equivalent, and be signposted to identify an ecological sensitivity. The sensitive protected species (e.g. badger) will not be identified in any signage. The ecologist will assess and verify the demarcation and signage before works commence; and
- In the event that previously unidentified badger setts are detected, the recommendations set out in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2007) will be applied, and the ecologist will formally agree any proposed additional mitigation measures with the local NPWS Conservation Ranger. Further consultation and wildlife derogation licences may be required.

Surface water measures

See also measures listed in section 5.1.13.

- Prior to construction, all Methods Statements for watercourse crossings will be issued to IFI for agreement;
- All instream works will avoid the IFI recommended ‘closed season’ (October to May, inclusive);
- All works will be undertaken in accordance with IFI Guidance on the protection of fisheries during construction works in and adjacent to waters (IFI, 2016);
- All construction works will be undertaken in accordance with CIRIA Guidance (CIRIA, 2001; CIRIA 2006a; CIRIA 2006b) titled “Control of water pollution from construction sites (C532)” and “Control of water pollution from linear construction projects (C648 and C649)”; and
- For the general protection of watercourses, the following measures will be employed:
 - Stockpiling of construction materials will be strictly prohibited within 5 m of any ditch or water-laden channel;
 - Hazardous materials including diesel, fuel oils, solvents, paints and/or lubricants stored on site will be stored within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container;
 - Re-fuelling of plant will not occur within 20 m of any watercourse or surface water/groundwater feature. Drip trays will be used, and spill kits will be kept available and used if necessary;
 - Fuel will be transported in a mobile, double skinned tank;
 - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
 - Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be readily available at strategic site locations and relevant all will be familiar with emergency procedures; and
 - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, with an appropriate emergent response put in place. Any contaminated soil will be removed from the site and properly disposed of.
- For the protection of watercourses associated with the onshore substation site, the following measures will be employed:
 - All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of

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alkaline waste waters to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite;

- Ensure run-off generated from dewatering activities for discharge to surface waters is treated utilizing temporary settlement pond/tanks(s) in accordance with CIRIA Report No.113 titled “Control of groundwater for temporary works” (CIRIA, 1986).
- Concrete will be contained and managed appropriately to prevent pollution of watercourses. Concrete pouring will be prevented during periods of heavy rainfall, and quick setting mixes will be used; and
- Waste materials will be stored in designated areas that are isolated from surface water drains. Skips will be closed or covered to prevent materials being blown or washed away.
- For the protection of watercourses associated with the trenchless works (i.e. HDD and tunnelling) at the M1 motorway/railway, River Dee (Richardstown and Drumcar), Ardballan/Port streams (Togher) and Salterstown stream, the following measures will be employed:
 - A buffer zone of at least 10 m will be established from the River Dee, Ardballan/Port streams and Salterstown stream crossings. The buffer zones will be physically demarked using post and rail/post and rope/bunting, or equivalent, and be signposted to identify an ecological sensitivity. The ecologist will assess and verify the demarcation and signage before works commence;
 - Silt fencing will consist of a maintainable geotextile membrane (equivalent to Terrastop™ Premium; 250 micron; 45 l/m²/sec). Installation, maintenance, and removal will follow the manufacturers’ specifications. The geotextile membrane will be inspected at least once a week and following any period of heavy rainfall; and
 - HDD crossing design will ensure no hydraulic connection or interference with the watercourses.
- Additionally, for the protection of watercourses associated with the use of bentonite during HDD operations:
 - At pre-construction, detailed site investigations will be undertaken to inform the final design of the HDD route. The results of the site investigations will significantly reduce the risk of a bentonite break out;
 - An aquatic ecologist will be required onsite to observe the HDD drill operations to ensure that no bentonite leaks or escapes into nearby surface waters;
 - Bentonite batching locations will be located at least 10 m from watercourses in order to minimise bentonite leaks and spills;
 - Earth banks and sand bag barriers will be used alongside silt fencing around bentonite batching areas in order to minimise bentonite leaks and spills;
 - The pressure of bentonite pumping will be strictly monitored, and lowered if necessary to mitigate against a bentonite breakout;
 - Monitoring of watercourses will be undertaken while works are in progress using hand-held water probes to measure pH, alongside visual observations for water quality characteristics including colour and turbidity;
 - Bentonite will be recycled through the HDD process but must be disposed of as controlled waste at the end of construction;
 - Should any inadvertent bentonite release occur, containment and clean-up operations will be in place, and works will cease immediately;
 - For releases on land, the Contractor will make immediately available (and the resources to deploy them) silt fences, sand bags and earth berms to prevent fluid from migrating or flowing from the immediate area of the discharge. Clean up operation will include removal equipment such as vacuum trucks and small pumps;
 - Should any inadvertent bentonite release occur, containment and clean-up operations will be in place, and works will cease immediately;
 - For releases on land, the Contractor will make immediately available (and the resources to deploy them) - silt fences, sand bags and earth berms to prevent fluid from migrating or flowing from the immediate area of the discharge. Clean up operation will include removal equipment such as vacuum trucks and small pumps.

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- For the protection of watercourses associated with the onshore cable route, the following measures will be employed:
 - Waste materials will be stored in designated areas that are isolated from surface water drains. Skips will be closed or covered to prevent materials being blown or washed away.
- For all works associated with joint bays 10-29, and the TJB, inclusive, the following measures will be employed:
 - All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline waste waters to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite;
 - Ensure run-off generated from dewatering activities for discharge to surface waters is treated utilizing temporary settlement pond/tanks(s) in accordance with CIRIA Report No.113 titled “Control of groundwater for temporary works” (CIRIA, 1986);
 - Concrete will be contained and managed appropriately to prevent pollution of watercourses. Concrete pouring will not occur during periods of heavy rainfall, and quick setting mixes will be used; and
 - Waste materials will be stored in designated areas that are isolated from surface water drains. Skips will be closed or covered to prevent materials being blown or washed away.
 - Open trench crossings at the Newhall stream and the Port stream at Clonmore will be achieved by fluming the existing stream flow through one or more pipes depending on the size of the flows in the stream. The flume pipe(s) will be approx. 10 m long and the diameter suitable to accommodate the existing flows. Where applicable, under the supervision of the ecologist, spawning gravels will be removed at the stream crossing areas where construction will take place. The extent of spawning gravel removal will be agreed for each site with IFI prior to construction commencing. Following the installation of the cable ducts, the stream bed (and associated riparian habitat) will be reinstated with original or similar material and the spawning gravels replaced under the supervision of the aquatic ecologist.

Removal and/or fragmentation measures

- The removal of existing hedgerow will avoid the bird nesting season (March to August, inclusive);
- Replacement at all hedgerow removal locations will be undertaken and the following measures will be employed:
 - All replacement planting will be of native tree/shrub species of Irish provenance (i.e. from within the island of Ireland);
 - Replacement planting at each location will be dominated by native species identified for those locations within the baseline. Where ash was the dominant hedgerow species removed, hawthorn or blackthorn will be planted as dominant instead;
 - The dominant tree species in the planting will be feathered whips, while sub-dominant species will be greater than 40 cm in height;
 - All replacement hedgerow planting will contain, at a minimum, four native tree/shrub species;
 - Planting will follow a double-row format of zig-zag pattern, with row spacing at 50 cm and tree spacing at 40 to 45 cm; and
 - All replacement hedgerows will be maintained for eight years, with seasonal checks by a suitably qualified arboriculturalist/ecologist for the first two years and yearly checks for the subsequent six years. A rate of 90% living individuals after four years and 80% living individuals at eight years will be retained, with replacement planting as required. Any gaps greater than 1 m will be replanted with native tree/shrub species of similar size to those adjacent.
 - Depending on the progression of hedgerow/tree replanting and restoration, maintenance of vegetation may extend beyond an eight year period. This will be determined by a suitably qualified ecologist.
- Replacement of hedgerow associated with joint bay 20 will also include 20 to 40% replanting with spindle. Maintenance, as outlined above, will also be completed;

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- Several mature trees, identified as having low and moderate suitability for roosting bats (BT2, BT3, BT6, BT7, BT24, BT25) will be retained; and
- Several mature trees, identified as having low suitability for roosting bats (BT4, BT5, BT14-18) are assessed to be removed. These trees will be 'soft' felled. Soft felling will include the following measures:
 - Felling to be undertaken under the supervision of the ecologist;
 - Felling of entire tree from base, allowing the tree to fall (i.e. no introduced force);
 - The ecologist will inspect the felled tree for further evidence of bat roosting. If evidence is found, all works on that tree will be halted and the local NPWS Conservation Ranger will be contacted. No further works on that tree will be permitted without agreement from the NPWS; and
 - Tree to be left in place (uncut) for 24 hrs, after which, sectioning, chipping, and removal can take place.

Invasive alien species measures

- Before construction begins, avoidance and management measures for Invasive Alien Plant Species (IAPS) listed in the third schedule for the EC birds and Natural Habitats Regulations, 2011 (as amended) will be implemented by the ecologist or a suitably qualified and experienced invasive species specialist. These measures will include the following information and management protocols for dealing with occurrences of scheduled invasive species:
 - Pre-construction field surveys for IAPS within the planning application boundary of the Project will be completed by the Ecologist;
 - A buffer zone of 10 m will be put in place around all known location of IAPS. The buffer zone will be physically demarcated using post and rail/post and rope/bunting, or equivalent, and be signposted to identify an ecological sensitivity. The ecologist will assess and verify the demarcation and signage before works commence;
 - Prior to works commencing within the vicinity of any IAPS, all site personnel will be given a Toolbox talk where operatives will be briefed on the presence of the IAPS and the legal protection that badgers and setts are afforded;
 - All excavated material within 7 m of the IAPS locations will be considered to be contaminated with material (roots, stem fragments, or seeds) suitable to cause the spread of IAPS (see Transport Infrastructure Ireland (TII), 2020) and be disposed of at an appropriately licensed waste facility; and
 - No disturbance of IAPS will take place during the works, apart from essential works within the 7 m buffer zone for construction of the Project.
- The materials which are introduced to the site during the construction will be free from scheduled invasive species, with certification of such;
- Where a scheduled invasive species is accidentally introduced or becomes established within the Project site during pre-construction surveys and/or the construction phase, works will be immediately halted and an effective exclusion zone will be erected (minimum 10 m) until such time that the ecologist/invasive species specialist can assess the site(s), and implement the required management protocol (as set out in the measures above);

5.6 Land and agriculture

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on land and agriculture during the construction phase:

- Existing access to property, including homes, agricultural fields and farm facilities will, where practicable, be maintained during construction. Otherwise, reasonable temporary access will be provided;
- Any disruption to water supply will be reinstated immediately by the Contractor or an alternative source supplied until the source is reinstated, unless otherwise agreed with the landowner;
- All drainage likely to be affected or disturbed during the construction phase will be identified and reinstated; and

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- All land hedgerows, fencing and access, where required temporarily during the construction will be reinstated.

5.7 Soil, geology and hydrogeology

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on soil, geology and hydrogeology during the construction phase:

- Excavated materials will be carefully managed in accordance with industry best practice during construction, to prevent any potential negative impact on the receiving environment and the excess material will be considered for reuse or be taken directly to an appropriately licenced facility avoiding contact with any open surface water drains;
- Excavated material will not be left uncovered to avoid run-off of silty water and excavations will be backfilled at the earliest convenience to avoid leaving stockpiles exposed;
- During the earthworks phase of construction, all lands including those temporarily acquired, will be reinstated to pre-construction conditions unless otherwise agreed with the landowner. The construction of the substation, TJB, onshore cable joint bays will require lands permanently. The lands for construction compounds, passing bays and access routes will require lands temporarily and as such may be potentially damaged due to the construction activities and need re-instatement. The structure of soils within temporary construction and access areas will be potentially affected from being trafficked by construction vehicles. The potential to damage soil structures will become more pronounced when construction activities occur during wet periods;
- All drainage likely to be affected or disturbed during the construction phase will be identified and reinstated. Field drainage systems currently in-situ may be disturbed and in places disabled during construction. This disturbance may lead to wet or flooded fields during spells of wet weather and farm productivity could be reduced;
- Management of topsoil and subsoil will be managed in accordance with industry best practices such as the Department of Environment, Food and Rural Affairs (UK) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites and the EPA's Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects;
- For all trenching along the road, all excavated material will be taken off-site in trucks and managed, under licence from the appropriate authority, thus preventing any contaminated run-off to roadside drains during heavy rainfall. In off-road areas where the top 400 to 500 mm of topsoil will be set aside within the wayleave for later reinstatement, these stockpiles will be stored at least 10 m back from drains and watercourses on level ground with a silt fence inserted at the base;
- Imported materials to the site will be sourced from a reputable supplier (who will provide certification of materials where required) to ensure that only clean material is brought to site;
- Dewatering all groundwater from the trench, joint bays, etc. will be managed in line with industry best practices;
- Groundwater and surface water accumulating in the base of trenches will not be pumped directly to roadside drains or watercourses unless it is clean and free from solids. Solids-contaminated water will be discharged to a designated percolation area designated by a competent person if the soil is not waterlogged. In the case of heavy contamination, the water will either be removed off-site for disposal in a licensed facility by tank truck or pumped to a portable on-site settlement tank for treatment. These operations will be monitored by a designated competent member of the construction team on a regular basis to ensure that they are working effectively;
- Temporary storage of Cement Bound Material (CBM) will be carefully managed. This will be stored on hardstanding areas only where there is no direct drainage to surface waters and where the area has been bunded. Measures will be applied by using sandbags and geotextile sheeting or silt fencing to contain any solids in run-off.

The Project includes designed-in measures such as emptying of employed bunds, provision of spill-kits and routine maintenance of equipment. The following measures will also be implemented to reduce the potential of adverse effects on groundwater:

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- The storage and handling of oils, fuel, chemicals and hydraulic fluids will be in secure areas within the site compounds and will not occur within a minimum of 10 m from watercourses; and
- Storage of fuels, chemicals and lubricants at the Contractor’s compound must be fenced off and have a lockable gate to prevent unauthorised access or vandalism. The principal control measures are as follows:
 - Protection measures will be put in place to ensure that all hydrocarbons used during the construction phase are appropriately handled, stored and disposed of in accordance with the TII/NRA document “Guidelines for the crossing of watercourses during the construction of National Road Schemes”. All chemical and fuel filling locations will be protected from potential spillages through the provision of appropriate protection measures including bunded areas and double skinned bowser units with spill kits;
 - Storage tanks shall have secondary containment provided by means of an above ground bund to capture any oil leakage. Storage tanks and associated provision, including bunds, will conform to the current best practice for oil storage and will be undertaken in accordance with Best Practice Guide BPGCS005 – Oil Storage Guidelines (Enterprise Ireland);
 - Where required, the pouring of concrete, sealing of joints, application of water-proofing paint or protective systems and curing agents will be completed in the dry and allowed to cure for 48 hours in order to avoid pollution of watercourses;
 - The use and management of concrete will be carefully controlled to avoid spillage;
 - The EIERP will be undertaken in the event of a spillage of chemical, fuel or other hazardous wastes (e.g. concrete) to be in place prior to commencement of construction;
 - Plant and equipment will be maintained in place and in working order for the duration of the works;
 - Temporary construction compounds (include storage facilities) will be located at a minimum of 10 m away from surface waters. In addition, measures will be implemented to ensure that silt laden or contaminated surface water run-off from the compound does not discharge directly to the surface waters. Temporary construction compounds will not be constructed in lands at risk of flooding;
 - All soiled construction run-off water will be passed through settlement ponds/silt traps and/or bunds prior to outfall to the receiving surface water where appropriate;
 - Management of material deposition areas to prevent siltation of watercourse systems through run-off during rainstorms through construction of collector ditches surrounding material stockpiles to contain run-off and direct it to the settlement ponds / silt traps before discharge to an adjacent watercourse;
 - Wheel wash facilities or similar facilities to be appropriately located to ensure wash waters are intercepted, contained and directed to settlement ponds / silt traps prior to discharge to surface waters; and
 - Any contaminated soils will be removed. The contaminated soil will then require to be quarantined, removed, and disposed of at an appropriate licensed facility.

The following GSI recommendations are also included within the proposed works:

- Access to the site is to be provided for GSI staff during construction to record the exposures of glacial till within the works; and
- GSI are to be provided sufficient notification of the commencement of works to allow GSI staff the opportunity to schedule resources to inspect the site.

5.8 Hydrology and flood risk

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on hydrology and flood risk during the construction phase:

- Following the installation of the cable ducts within watercourse crossings, in the case of an open trench construction method, the stream bed will be reinstated with original or similar material under the supervision of an aquatic ecologist;
- Section 5.1.13 outlines measures to be implemented by the Contractor related to surface water management; and

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- Section 5.1.14 outlines measures to be implemented by the Contractor related to accidental spills.
- Water quality sampling will be undertaken prior to construction in order to update the baseline, and on bimonthly basis at the onshore substation and cable crossing locations when rainfall results in any discharge from the site or from a control structure. If oils and grease are visually evident, a sample will be forwarded to an accredited laboratory for analysis. Monthly sampling will be adequate during times when there is no rainfall/site discharge. Water Quality Sampling to be undertaken using hand-held water probes to measure the following: pH, turbidity, dissolved oxygen, Total Dissolved Solids (TDS), and temperature. Biological water quality sampling will also be paired with daily visual/sensory observations for water quality characteristics including: algae growth, presence of foam, turbidity, colour, presence of oil, and odour.

5.9 Air quality

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on air quality during the construction phase:

- Implementation of the CTMP (see EIAR appendix 5-9: Construction Traffic Management Plan);
- Temporary site roads will be regularly cleaned and maintained as appropriate. Hard surface roads (public and site) will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only;
- Any temporary site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions (also applies to vehicles delivering material with dust potential);
- All vehicles exiting the works will make use of a wheel wash facility (or similar) prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Wheel washes will be self-contained systems that do not require discharge of the wastewater to water bodies;
- Public roads outside the works will be regularly inspected for cleanliness, and cleaned as necessary;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- All vehicles which present a risk of spillage of materials, while either delivering or removing materials, will be loaded in such a way as to prevent spillage on to the public road;
- The Contractor will be required to ensure that all vehicles are suitably maintained to ensure that emissions of engine generated pollutants is kept to a minimum; and
- Section 5.1.12 outlines measures to be implemented by the Contractor related to dust control.

5.10 Noise and vibration

Section 5.1.11 outlines the measures to be implemented by the Contractor to reduce the potential for impacts on noise and vibration during the construction phase.

5.11 Cultural heritage

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on cultural heritage during the construction phase:

- The construction team will be made aware of the locations of those upstanding structures that are designated Record of Protected Structures (RPS) / National Inventory of Architectural Heritage (NIAH) sites and the Cultural Heritage sites situated in the immediate vicinity of the onshore cable route (see EIAR appendix 26-1: Cultural Heritage Report, Tables 1-2, 1-3 and 1-5);
- (CH6) A photographic and written record of the impacted section of the rubble stone wall at Drumcar will be made. The impacted section of the wall will be rebuilt using traditional methods and the same

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materials subject to agreement and any other requirements as may be agreed with the planning authority prior to the commencement of construction;

- A section of woodland shelterbelt associated with the former Drumcar Demesne (GS ID: GS2) will be impacted. Replanting to restore any breach in the wooded shelterbelt with similar trees will be undertaken where feasible;
- The location of the boulder known as the 'Mad Chair of Dunany' on Dunany beach (located outside the planning application boundary at approximately ITM 715647, 791296) will be made known to the construction team;
- An exclusion zone (i.e. where no construction or earthmoving works will take place) of >5 m from the southern walled/hedgerow boundary of Dunany Demesne will be maintained during construction; and
- No works will be carried out that will damage the boundary wall of Dunany Demesne. The proposed permanent access track to TJB (Option 2) will be installed 5 m away from the Dunany Demesne wall to ensure no impact on this feature.

AAP1 – Dunany Demesne and Beach; AAP2 – Port/Boycetown

The following mitigation measures are required for the protection of unidentified subsurface archaeological sites or features or additional stray finds at and within the vicinity of AAP1 and AAP2:

- A programme of archaeological monitoring will take place at the pre-construction and early phases of construction, during the stripping of topsoil, site preparation and earthmoving works, and where any preparatory ground reduction works are required;
- The archaeological monitoring will be carried out by a suitably qualified archaeologist under Licence to the Department of Housing, Local Government and Heritage (DHLGH). This will ensure the full recognition of, and the proper excavation and recording of all archaeological soils, features, finds and deposits which may be disturbed below the ground surface;
- In the event of the discovery of archaeological finds or remains, the National Monuments Service (NMS) and the National Museum of Ireland (NMI) will be notified immediately. If features are revealed, the immediate area will need to be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or alternatively avoided (by rerouting the onshore cable) to the satisfaction of the statutory authorities. This possibility will be accounted for in the Project programme and budget, and will be undertaken at the earliest phases of the Project to allow the archaeologists sufficient time to record/excavate as required;
- Provision will be made to allow for, and fund any, archaeological work that may be needed if any remains are noted. In accordance with legislative requirements the funding provision will include the production of written reports on the findings, with post-excavation analyses and publications of the results of the works, where appropriate; and
- A report detailing the results of the monitoring will be submitted to the DHLGH upon completion of the works in accordance with the terms and conditions of the archaeological licence; and
- A 5 m buffer zone from the southern boundary of Dunany Demesne will be maintained to ensure no accidental damage to the demesne boundary wall during construction works.

AAP3 – Clonmore

The following mitigation measures are required for the protection of subsurface archaeological features, soils or finds (including the potential to reveal burials), related to the settlement at Clonmore and within the vicinity of AAP3:

- All earthmoving works associated with the cable installation in the area adjacent to the recorded archaeological sites in Clonmore (AAP3), including any temporary/enabling works associated with the Project will require archaeological monitoring under license issued by the DHLGH. The purpose of monitoring is to identify any archaeological material or features that are uncovered during ground disturbance works;
- In the event of the discovery of archaeological finds or remains, the National Monuments Service (NMS) and the National Museum of Ireland (NMI) will be notified immediately. If features are revealed, the immediate area will be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or alternatively avoided (by rerouting the cable) to the satisfaction of

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the statutory authorities. This possibility will be accounted for in the Project programme and budget, and will be undertaken at the earliest phases of the Project to allow the archaeologists sufficient time to record/excavate as required; and

- Provision will be made to allow for, and fund any, archaeological work that may be needed if any remains are noted. In accordance with legislative requirements the funding provision will include the production of written reports on the findings, with post-excavation analyses and publications of the results of the works, where appropriate.

AAP4 – Drumcar

The following mitigation measures are required for the protection of known archaeological features either side of the River Dee crossing at and within the vicinity of AAP4:

- It is recommended that the onshore cable route and associated wayleave be subject to full licenced excavation of the archaeological features identified on either side of the River Dee (ring ditch, field system and habitation activity) within the construction area well in advance of construction. This will allow time for any archaeological remains within the wayleave to be archaeologically excavated and preserved by record under licence to the NMS; and
- Provision will be made to allow for, and fund any, archaeological work that may be needed if any remains are noted. In accordance with legislative requirements the funding provision will include the production of written reports on the findings, with post-excavation analyses and publications of the results of the works, where appropriate.

The following mitigation measure is required to ensure the wooded shelterbelt within the former demesne of Drumcar House (NIAH Garden LH0026), in the southernmost part of the demesne, is returned to its former function:

- The disturbed area will be replanted where possible noting restrictions over onshore cable route (see chapter 5: Project Description).

AAP5 – Greenfield

The following mitigation measures are required for the protection of subsurface isolated remains/features at and within the vicinity of AAP5.

It is unlikely that geophysical survey and testing in this area will capture isolated features similar to those identified on the N33 within the onshore cable route. Such sites are usually found during the topsoil stripping phase of the Project. Given the proven potential for the discovery of previously unknown and isolated sites in the vicinity of the Project:

- Archaeological monitoring of the earthmoving works will be carried out under license from DHLGH. The purpose of monitoring is to determine if any archaeological material or features are uncovered during ground disturbance works;
- In the event of the discovery of archaeological finds or remains, the NMS and the NMI will be notified. Provision will be made to allow for, and fund any, archaeological work that may be needed if any remains are noted;
- If features are revealed, the immediate area will be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or alternatively avoided to the satisfaction of the statutory authorities. This possibility will be accounted for in the Project programme and budget; and
- In accordance with legislative requirements the funding provision will include the production of written reports on the findings, with post-excavation analyses and publications of the results of the works, where appropriate.

AAP6 – Stickillin Substation

The following mitigation measures are required for the protection of archaeological features identified within the footprint of the onshore substation site at and within the vicinity of AAP6:

- It is recommended that two areas each measuring 20 m x 20 m be opened for full excavation and preservation by record in the areas of the burnt mound remains. This is to be carried out under licence to the NMS; and

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- The area south of the Stickillin field will be stripped of topsoil under archaeological supervision well ahead of commencement of construction on the site to establish if the features identified and indicated on geophysical survey is archaeological, and if so to make provision for its excavation or preservation in situ as appropriate.

AAP7 – Various Locations

The following mitigation measures are required for the protection of greenfield archaeological potential within the vicinity of AAP7:

- Licensed archaeological monitoring of earthmoving works in greenfield areas will be carried out. The purpose of monitoring is to identify any archaeological material or features are uncovered during ground disturbance works;
- In the event of the discovery of archaeological finds or remains, the NMS and the National Museum of Ireland (NMI) will be notified immediately. If features are revealed, the immediate area will be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or alternatively avoided (by rerouting the cable) to the satisfaction of the statutory authorities. This possibility will be accounted for in the Project programme and budget, and will be undertaken at the earliest phases of the development to allow the archaeologists sufficient time to record/excavate as required; and
- As above provision will be made to allow for, and fund any, archaeological work that may be needed if any remains are noted.

5.12 Landscape and seascape

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on landscape and seascape during the construction phase:

- Replacement hedgerow planting at locations along the onshore cable route; shallow rooting species where required over the onshore cable route to prevent disturbance of the cable by roots; and
- Restoration and repair of gates and fences that have been removed/damaged during the construction works.

5.13 Traffic and transport

The following measures (as outlined in the EIAR) will be implemented by the Contractor to reduce the potential for impacts on traffic and transport during the construction phase:

- Although onshore cable works will only have a temporary and limited traffic impact during the construction phase, there will still be a requirement for localised traffic management (see EIAR appendix 5-9: Construction Traffic Management Plan) to facilitate the installation of joint bays, and the trenching/ ducting for the cable. It is confirmed that local access to all dwellings, businesses and schools will be retained throughout the entire works through the provision of passing bays which have been designed into the Project. Please see chapter 5: Project Description for further information on passing bays;
- Implement sightlines In accordance with TII Publication DN-GEO—03060 (TII, 2017) are provided for the substation access and temporary access to the site compounds; and
- It is recommended that discussions will be had with St Finian’s National School and the St Colmcille National School schools to determine if there is any impact on bus routes/access. The sequencing of the works could be altered to ensure that works take place during school holidays.

5.14 Material assets

The following measures (as outlined in chapter 29: Material Assets the EIAR) will be implemented by the Contractor to reduce the potential for impacts on material assets during the construction phase:

- Any disruption to built services will be reinstated as soon as practicable, unless otherwise agreed with the asset owner, and where practicable by the Contractor;

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- Where required, ducting will be provided to allow for the provision of services (electrical/water) across severed areas unless otherwise agreed with the asset owner and where practicable;
- Any disruption to water supply will be reinstated immediately by the Contractor or an alternative source supplied until the source is reinstated, unless otherwise agreed with the landowner or Uisce Éireann as appropriate;
- Prior to commencement of construction works the Contractor will be required to engage with all built services providers. The Contractor will continue liaison with providers as required throughout the construction phase;
- Prior to any mechanical excavation taking place, there will be consultation with ESB Networks to establish and verify the exact locations of all underground electricity cables. Gas Networks Ireland (GNI) will also be consulted, and the exact position of the two gas transmission gas pipelines will be verified prior to works commencing; and
- All work being conducted in the vicinity of underground services will be completed in accordance with the current Health and Safety Authority (HSA) 'Code of Practice for Avoiding Danger from Underground Services'. Furthermore, the ESB Code of Practice and HSA guidance, including the 'Code of Practice for Avoiding Danger from Overhead Electricity Lines', regarding exclusion and safe operating distances around electricity infrastructure will be adhered to. Height restriction barriers and equipment will be used to demark electrical infrastructure.

5.15 Waste

The following measures (as outlined in chapter 20: Resource and Waste Management of the EIAR) will be implemented by the Contractor to reduce the potential for impacts on waste and coastal litter during the construction phase:

- Any waste and/or coastal litter arising from the construction, operation and maintenance, and decommissioning phases of the Project will be managed in accordance with the current national waste policy. Any waste and/or coastal litter that cannot be prevented or reused will be deposited at an appropriate facility;
- If any unforeseen waste or hazardous material is encountered during the course of the Project, the EPA will be notified, and the material will be deposited at an appropriate waste facility;
- A Waste Manager will be nominated who will have overall responsibility for the implementation of all waste and coastal litter processes. In conjunction with this, a clear responsibility structure will be introduced in the Project team to ensure issues encountered are raised at an appropriate level and acted upon;
- Records will be kept on the quantity nature/type and quality of all waste/ coastal litter leaving the site;
- The management of waste generated by the Project will reflect the waste management hierarchy, with waste prevention and minimisation being the priority succeeded by reuse and recycling. Where there are opportunities for the beneficial reuse and recycling of materials, these will be considered;
- Excess material will be made available for reuse off-site. It is anticipated that the available material will be a clean and valuable resource capable of meeting the specifications of a typical Class 1 material. This material can be reused in local projects under development, assuming by-product classification can be achieved. Alternatively, the material can be recovered at quarries in the local area and beyond. The availability of the material and the scheduling of local construction projects will be kept under review as the project develops. If reuse of surplus material is not possible, it will be sent for appropriate recovery. Any site identified for recovery of soil and stone will require the appropriate planning permission and waste authorisation in place to accept the material on-site;
- Sustainable practices will be implemented when choosing materials to be used in the construction of the Project, including the use of cement containing high levels of GGBS or recycled steel (see volume 2C, chapter 17: Climate for further detail relating to sustainable materials);
- All Contractors (and their Sub-Contractors) will produce a Waste Management Plan (WMP), providing details of all waste management procedures for their activities and details of expected waste arisings and proposed procedures for waste management. The Contractor's Environmental Manager will be

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responsible for the compilation of this document. The WMP will include the following aspects as a minimum:

- Analysis of the waste arisings/material surpluses;
 - Specific waste management objectives for the Project;
 - Methods proposed for prevention, reuse and recycling of wastes;
 - Material handling procedures; and
 - Proposals for education of workforce and plan dissemination programme.
- The WMP will be prepared in accordance with the EPA Best Practice Guidelines for the Preparation of Resources & Waste Management Plans for Construction and Demolition Projects; and
 - All contractors will be obliged to implement and maintain the following measures and actions as part of the WMP (where relevant):
 - Meet all relevant legislative and EIAR requirements and obtain whatever additional permits and licences are necessary in relation to waste management;
 - Communicate the requirements of the WMP to all personnel during their induction and ensure all operatives on site attend waste reduction toolbox talks to increase awareness of recycling/waste reduction;
 - Transfer of waste or refuse will only be conducted by licensed waste carriers and waste treatment and waste disposal will be conducted by licensed and permitted waste management companies, in compliance with applicable waste legislation and current national waste policy. This is necessary so that all waste is disposed of to the best possible facility type to adhere to the circular economy and resource opportunity strategies;
 - Be compliant with and use the current version of Transfrontier Shipment of Waste Regulations where waste is being exported by Contractors (or their subcontractors). Export of waste will also be in line with the principles of the Basel Convention of 1989, which was agreed internationally to avoid hazardous waste being unfairly exported to developing countries;
 - If unforeseen waste or hazardous material is encountered during the Project, the appropriate authorities will be notified, and the material will be deposited at an appropriate waste facility;
 - Appropriate measures will be employed to identify unexpected, contaminated soil and stone material. These measures will include early identification of locations where contamination is more likely. Staff will be trained in how to identify contamination and how to manage it if encountered. Identification will include visual checks for unusual discolouration, oil sheens, anthropogenic materials, and checks for olfactory clues such as hydrocarbon or other odours. Suspect contaminated material will be sampled and appropriately analysed at laboratory;
 - Records will be kept on the quantity nature/type and quality of all waste leaving the site. Good record keeping being conducted by the contractor including quantities (tonnes) and type of waste and materials leaving the site. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material, which is recovered, and which is disposed;
 - Source separating wastes into dry mixed recyclables, biodegradable, and residual wastes. Clear labelling of waste bins, containers, skip containers and storage areas, including waste stream colour coding and photographs as appropriate;
 - Appropriate Storage: Waste fuels/oils will be generated from equipment used on-site during construction and will be classified as hazardous waste. Paints, sealants, and hazardous chemicals etc. will be stored in secure, bunded locations. All hazardous waste will be separately stored and labelled, in appropriate lockable containers, prior to removal from site by an appropriately permitted waste collection service provider; and
 - Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.

References

CIRIA (1986). Report 113. Control of groundwater for temporary works.

CIRIA, 2001. CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites. Item Detail (ciria.org).

CIRIA (2006a). Control of water pollution from linear construction projects. Technical guidance (C648).

CIRIA (2006b). Control of water pollution from linear construction projects. Site guide (C649).

Enterprise Ireland (nd). Best Practice Guide BPGCS005 – Oil Storage Guidelines.

IFI, 2016. Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters
Guidelines on protection of fisheries during construction works in and adjacent to waters | Inland Fisheries Ireland.

NRA (2007). Guidelines for the Treatment of Badgers during the Construction of National Road Schemes.

NRA (2008). Guidelines for the crossing of watercourses during the construction of National Road Schemes. 80359 wetlands (tii.ie).

TII (2017). Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions). DN-GEO—03060

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A.1 Required contractor's information


The information listed in the table below will be provided by the Contractor to the *Employer* according to the provisions of the contract, as indicated.

To be updated post-consent in accordance with planning permission

Documents / Information (and updates thereof) required	Pre-start of works	During and after construction
Consents, licences, and permissions for activities as required by current legislation governing the protection of the environment		
Completed / Updated Contacts Sheet		
Pollution Prevention Plan		
Fuel Management Plan		
Drainage Maintenance Register		
Weekly Environmental Risk Log		
Geotechnical Risk Register		
Environmental Risk Map		
Toolbox Talk Schedule		
Environmental Inspection Schedule		
Risks register, Risk Assessment and Method Statements		
Construction Waste Management Plan and related information		
Excavation / Reinstatement records and plans		
Inspection and Audit Reports		
Water monitoring records		
Environmental Incident and Emergency Response Plan		

Note: The above list only relates to requirements of this CEMP and is not exhaustive. As part of the Contract, other information provisions will also be required from the Contractor.

A.2 Environmental Policy

	HSSE Policy			
	Document ID	PWD-HSSE-POL-0001		
	Scope	Department	Revision	Status
	Parkwind	HSSE	5.0	Final
			Date	26/01/2021

As a leading company in the development and generation of green and sustainable energy, Parkwind strives to be an industry leader in the management of Health, Safety, Security and Environmental risks, and the optimization of improvement opportunities throughout everything it does.

The Parkwind HSSE philosophy is based on the following principle:

“No one gets hurt, nothing gets damaged and all risks are controlled and managed”




Health, Safety, Security and Environmental protection is a prime business objective, and it is the responsibility of top management and supervision to ensure the principles and the commitments stated within this Policy, are consistently achieved throughout.

To ensure common understanding, approach, and achievement of HSSE goals, Parkwind will actively encourage all partners, contractors, and subcontractors to adopt all HSSE Policy principles and commitments throughout their engagement.

To enable the HSSE principles to be achieved, Parkwind shall commit to ensuring:

- a HSSE Management System is established, implemented and maintained with the purpose of eliminating hazards and reducing HSSE risks;
- the provision of safe and healthy working conditions for the prevention of work-related injury and ill-health and to avoid security breaches, damage and/or pollution to the environment;
- HSSE objectives and targets are set, monitored, and reviewed to ensure compliance is being maintained;
- As a minimum, compliance with all applicable legal and other requirements and obligations;
- implementing known and approved industry standards and leading the way if such standards are not available;
- consult and ensure the active participation of all employees and contractor personnel on all HSSE related arrangements and issues and empower them to take action to stop the works if they feel the risks involved to be unacceptable;
- provide suitable and sufficient HSSE information, instruction and training to enable all personnel to carry out their job competently;
- continuous monitoring, review, and improvement of HSSE performance and the effectiveness of this HSSE Policy and HSSE Management System

The Executive Management of Parkwind underwrites this Policy, commits to provide adequate and appropriate resources and will ensure this Policy is properly communicated and understood by all.

	François Van Leeuw (co-CEO)	Eric Antoons (co-CEO)
		

A.3 Commitments Register

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation		
No.	Topic	EIAR Chapter	Aspect	Commitment (please read in conjunction with the EIAR chapter)	Related Planning Condition	Relevant document for Implementation	Responsible Party
1	Climate	Chapter 17	Materials with reduced environmental impact	Materials with a reduced environmental impact will be incorporated into the construction design through re-use of materials or incorporation of recycled materials in place of conventional building materials. The following materials shall be considered for the construction phase:- •Ground Granulated Blast Furnace Slag (GGBS) & Pulverised Fuel Ash - Used as replacements for Portland cements to increase sustainability and carbon footprint of civil and structural works; and •Steel - The recovery rates associated with using recycled steel are high and research exists which shows that 99% of structural steel arising from demolition sites is recycled or re-used. The carbon emissions emitted during the production of virgin steel can be higher than some other structural materials on a tonne by tonne basis, and recycled steel should be used where possible.	To be updated.	CEMP	Applicant/ Contractor
2	Climate	Chapter 17	Measures to minimise CO2 during construction	The following measures will be implemented by the Contractor to avoid/minimise CO ₂ emissions during the construction phase: •Reducing the idle times by providing an efficient material handling plan that minimizes the waiting time for loads and unloads. Reducing idle times could save 10% of total emissions during construction phase; •Turning off vehicular engines when not in use for more than five minutes. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and •Regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they will perform the most efficiently.	To be updated.	CEMP	Applicant/ Contractor
3	Climate	Chapter 17	Energy management measures during construction	The Contractor will be required to implement energy management measures for the duration of the works such as: •The use of thermostatic controls on all space heating systems in site buildings to maintain optimum comfort at minimum energy use; •The use of sensors on light fittings in all site buildings and low energy lighting systems; •The use of adequately insulated temporary building structures for construction compounds fitted with suitable vents; •The use of low energy equipment and 'power saving' functions on all PCs and monitors in the site offices; •The use of low flow showers and tap fittings; and •The use of solar/thermal power to heat water for the on-site welfare facilities and contamination unit (sinks and showers).	To be updated.	CEMP	Applicant/ Contractor
4	Climate	Chapter 17	Carbon footprint	The Contractor will be required to measure and record all activity data (fuel use, material use, transport, etc.) to allow for the development of a carbon footprint for the construction phase of the Project.	To be updated.	CEMP	Applicant/ Contractor
5	Population and Human Health	Chapter 18	CEMP CTMP	Implement Construction Transport Management Plan (CTMP)	To be updated.	CEMP; CTMP	Applicant/ Contractor
6	Population and Human Health	Chapter 19	CEMP	Training and employment opportunities will be offered through a workforce management plan.	To be updated.	-	Applicant/ Contractor
7	Biodiversity	Chapter 19	EMP	For overall Onshore Biodiversity management a an Ecological Management Plan will be produced and implemented. This will include all measures included in section 5.5 of the CEMP.	To be updated.	CEMP	Applicant/ Contractor
8			Buffer Zone	A 10 m buffer zone from Dunany Point pNHA will be implemented on the landward side within the planning application boundary. The buffer zone will be physically demarked using post and rail/post and rope/bunting, or equivalent, and be signposted to identify an ecological sensitivity. The ecologist will assess and verify the demarcation and signage before works commence. See EIAR appendix 19-1: Onshore Biodiversity – Supporting Information, section 19.4 for specific detailed measures;	To be updated.	CEMP	Applicant/ Contractor
9			Pre-construction surveys	Pre-construction surveys (complete protected and invasive species survey, including breeding bird assessment). See appendix 19-1, section 19.4 for specific detailed measures.	To be updated.	CEMP	Applicant/ Contractor
10			Timing of works	Timing of the works at the landfall to avoid the peak season for intertidal birds (October to April, inclusive). Timing of vegetation removal works to avoid the bird nesting season (March to August, inclusive). Avoidance of light spill during night-time hours, and badger buffer zones between 30 m and 150 m depending on works type and season. See appendix 19-1, section 19.4 for specific detailed measures.	To be updated.	CEMP	Applicant/ Contractor
11			Timing of works	Timing of the works to avoid the bird nesting season (March to August, inclusive), replacement of all removed hedgerows, retention of trees with moderate suitability to roosting bats, and soft felling of trees with low suitability for roosting bats. See appendix 19-1, section 19.4 for specific detailed measures.	To be updated.	CEMP	Applicant/ Contractor
12			Timing of works	Timing of the instream works to avoid the IFI recommended 'closed season' (October to May, inclusive), and protection of watercourses from siltation, hydrocarbons and other pollutants using suitably material storage, procedures, buffer zones, and sediments control measures. See appendix 19-1, section 19.4 for specific detailed measures.	To be updated.	CEMP	Applicant/ Contractor
13			Land and Agriculture	Chapter 20	Access to property	Existing access to property, including homes, agricultural fields and farm facilities will, where practicable, be maintained during construction, otherwise reasonable temporary access will be provided.	To be updated.
14	Disruption to water supply	Any disruption to water supply will be reinstated immediately by the Contractor or an alternative source supplied until the source is reinstated, unless otherwise agreed with the landowner			To be updated.	CEMP	Applicant/ Contractor
15	Drainage	All drainage likely to be affected or disturbed during the construction phase will be identified and reinstated.			To be updated.	CEMP	Applicant/ Contractor
16	Subsoiling of agricultural lands	All agricultural lands temporarily acquired for the construction will, before return to the landowner, be subsoiled to alleviate compaction and minimise risk of impeded crop growth and will be re-instated to pre-construction conditions unless otherwise agreed with the landowner.			To be updated.	CEMP	Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation				
No.	Topic	EIAR Chapter	Aspect	Commitment (please read in conjunction with the EIAR chapter)	Related Planning Condition	Relevant document for Implementation	Responsible Party		
17	Soil, Geology and Hydrogeology	Chapter 21	Excavated material	Excavated materials will be carefully managed in accordance with industry best practice during construction, to prevent any potential negative impact on the receiving environment and the excess material will be taken directly to an appropriately licenced facility avoiding contact with any open surface water drains. Excavated material will not be left uncovered to avoid run-off of silty water and trial pits will be backfilled at the earliest convenience to avoid leaving stockpiles exposed.	To be updated.	CEMP	Applicant/ Contractor		
18			Re-instatement of earthworks	During the earthworks stage of construction, all lands including those temporarily acquired, will be re-instated to pre-construction conditions unless otherwise agreed with the landowner.		CEMP	Applicant/ Contractor		
19			Management of topsoil and subsoil	Management of topsoil and subsoil will be managed in accordance with industry best practices. For all trenching along the road, all excavated material will be taken off-site in trucks and disposed of, under licence from the appropriate authority, thus preventing any contaminated run-off to roadside drains during heavy rainfall. In off-road areas where the top 400-500 mm of topsoil will be set aside within the wayleave for later reinstatement, these stockpiles will be stored at least 15 m back from drains and watercourses on level ground with a silt fence inserted at the base.	To be updated.	CEMP	Applicant/ Contractor		
20			Imported materials	Imported materials to the site shall be sourced from a reputable supplier to ensure that only clean material is brought to site.	To be updated.	CEMP	Applicant/ Contractor		
21			Dewatering all groundwater	Dewatering all groundwater from the trench and joint bays will be managed in line with industry best practices. Groundwater and surface water accumulating in the base of trenches will not be pumped directly to roadside drains or watercourses unless it is clean and free from solids. Solids-contaminated water will be discharged to a designated percolation area designated by a competent person if the soil is not waterlogged. In the case of heavy contamination, the water will either be removed off-site for disposal in a licensed facility by tank truck or pumped to a portable on-site settlement tank for treatment. These operations will be monitored by a designated competent member of the construction team on a regular basis to ensure that they are working effectively.	To be updated.	CEMP	Applicant/ Contractor		
22			Temporary storage of CBM 4	Temporary storage of CBM 4 will be carefully managed. This will be stored on hardstanding areas only where there is no direct drainage to surface waters and where the area has been bunded. Will be applied by using sandbags and geotextile sheeting or silt fencing to contain any solids in run-off.	To be updated.	CEMP	Applicant/ Contractor		
23			County Geological Site	The cable route and TJB has been developed to minimise impact on the County Geological Sites along the coast.	To be updated.	CEMP	Applicant/ Contractor		
24			Imported crush rock	Imported crushed rock which is imported to the site shall be sourced from a reputable supplier to ensure that only clean material is brought to site.	To be updated.	CEMP	Applicant/ Contractor		
25			Drainage	All drainage likely to be affected or disturbed during the construction phase will be identified and reinstated.	To be updated.	CEMP	Applicant/ Contractor		
26			Storage and handling of oils, fuels, chemicals and hydraulic fluids	<ul style="list-style-type: none"> •The storage and handling of oils, fuel, chemicals and hydraulic fluids will be in secure areas within the site compounds and will not occur within a minimum of 10 m from watercourses; •Storage of fuels, chemicals and lubricants at the Contractor's compound must be fenced off and have a lockable gate to prevent unauthorised access or vandalism. •The principal control measures are as outlined in section 5.7 of the CEMP. 	To be updated.	CEMP	Applicant/ Contractor		
27			GSI Recommendations	The following GSI recommendations are also included within the proposed works: <ul style="list-style-type: none"> •Access to the site is to be provided for GSI staff during construction to record the exposures of glacial till within the works; and •GSI are to be provided sufficient notification of the commencement of works to allow GSI staff the opportunity to schedule resources to inspect the site. 			Applicant/ Contractor		
28			Hydrology and Flood Risk	Chapter 22	Reinstatement of stream beds	Following the installation of the cable ducts within watercourse crossings, in the case of an open trench construction method, the stream bed will be reinstated with original or similar material under the supervision of an aquatic ecologist.	To be updated.	CEMP	Applicant/ Contractor
29					Surface water Management	The contractor will be required to implement the following surface water management measures prior to commencing construction and decommissioning works on site, in accordance with Best Practice Guidance for the storage of oil BPGCS005 – Oil Storage Guidelines (Enterprise Ireland, nd), and CIRIA guidance (Report No.113 titled "Control of groundwater for temporary works" (CIRIA, 1986)). The mitigation measures will include and are not limited to those set out in 5.1.13 of the CEMP:	To be updated.	CEMP	Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation		
No.	Topic	EIAR Chapter	Aspect	Commitment (please read in conjunction with the EIAR chapter)	Related Planning Condition	Relevant document for Implementation	Responsible Party
30	Air Quality	Chapter 23	Traffic Management Plan	Implement Construction Traffic Management Plan (CTMP)	To be updated.	CEMP, CTMP	Applicant/ Contractor
31			Site roads	<ul style="list-style-type: none"> •Site roads shall be regularly cleaned and maintained as appropriate. Hard surface roads shall be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only; •Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions (also applies to vehicles delivering material with dust potential); •All vehicles exiting the site shall make use of a wheel wash facility prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads; •Wheel will be self-contained systems that do not require discharge of the wastewater to water bodies; •Public roads outside the site shall be regularly inspected for cleanliness, and cleaned as necessary; •Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind; •Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods; •All vehicles which present a risk of spillage of materials, while either delivering or removing materials, will be loaded in such a way as to prevent spillage on to the public road; •The Contractor will be required to ensure that all vehicles are suitably maintained to ensure that emissions of engine generated pollutants is kept to a minimum; and •The Contractor will be required to monitor monthly dust deposition levels each month for the duration of construction for comparison with the guideline of 350 mg/m²/day (for non-hazardous dusts). This monitoring should be carried out at a minimum of four locations at sensitive receptors around the Project works. Where dust levels are measured to be above this guideline the mitigation measures in the area will be reviewed as part of the CEMP. 	To be updated.	CEMP	Applicant/ Contractor
32	Noise and Vibration	Chapter 25	Competent professional	Contractor to engage a competent acoustician for the duration of construction.	To be updated.	CEMP	Applicant/ Contractor
33			Monthly noise and vibration report	Implement noise control measures as outlined in section 5.1.11 of CEMP.	To be updated.	CEMP	Applicant/ Contractor
35	Cultural Heritage	Chapter 26	Cultural Heritage Sites	The construction team will be made aware of the locations of those upstanding structures that are designated RPS / NIAH sites and the Cultural Heritage sites situated in the immediate vicinity of the onshore cable corridor (Figure 26-4, Appendix 26-1-4, Tables 26-2, 26-3 and 26-5). This will be incorporated into the EMP.	To be updated.	CEMP	Applicant/ Contractor
36			CH6 impacted section	(CH6) A photographic and written record of the impacted section of the rubble stone wall at Drumcar will be made. The impacted section of the wall will be rebuilt using traditional methods and the same materials subject to agreement and any other requirements as may be agreed with the planning authority prior to the commencement of construction	To be updated.	CEMP	Applicant/ Contractor
37			GS2 impacted section	A section of woodland shelterbelt associated with the former Drumcar Demesne (GS2) will be impacted. Replanting to restore any breach in the wooded shelterbelt with similar trees will be undertaken.	To be updated.	CEMP	Applicant/ Contractor
38			Mad chair	The location of the boulder known as the 'Mad Chair of Dunany' on Dunany beach (located outside the planning application boundary at approximately ITM 715647, 791296) will be made known to the construction team;	To be updated.	CEMP	Applicant/ Contractor
39			Dunany Demense wall	An exclusion zone (i.e. where no construction or earthmoving works will take place) of >5 m from the southern walled/hedgerow boundary of Dunany Demesne will be maintained during construction; and	To be updated.	CEMP	Applicant/ Contractor
40			Dunany Demense wall	No works will be carried out that will damage the boundary wall of Dunany Demesne. The proposed permanent access track to TJB (Option 2) will be installed 5 m away from the Dunany Demesne wall to ensure no impact on this feature.	To be updated.	CEMP	Applicant/ Contractor
41			AAP1 – AAP7	See measure for protection in section 5.11 of CEMP	To be updated.	CEMP	Applicant/ Contractor
42	Landscape and Seascape	Chapter 27	Onshore cable route	Replacement hedgerow planting at locations along the onshore cable route; shallow rooting species where required over the onshore cable route to prevent disturbance of the cable by roots.	To be updated.	CEMP	Applicant/ Contractor
43			Onshore cable route	Restoration and repair of gates and fences that have been removed/damaged during the construction works; and	To be updated.	CEMP	Applicant/ Contractor
44	Traffic and Transport	Chapter 28	Traffic management	Implement CTMP	To be updated.	CTMP	Applicant/ Contractor
45			Visibility splays	Implement sightlines In accordance with TII Publication DN-GEO—03060 (TII, 2017) are provided for the substation access and temporary access to the site compounds; and	To be updated.	CTMP	Applicant/ Contractor
46			Traffic management	It is recommended that discussions will be had with St Finian's National School and the St Colmcille National School schools to determine if there is any impact on bus routes/access. The sequencing of the works could be altered to ensure that works take place during school holidays.	To be updated.	CEMP	Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation		
No.	Topic	EIAR Chapter	Aspect	Commitment (please read in conjunction with the EIAR chapter)	Related Planning Condition	Relevant document for Implementation	Responsible Party
47	Material Assets	Chapter 29	Disruption to built services	Any disruption to built services will be reinstated as soon as practicable, unless otherwise agreed with the asset owner, and where practicable by the Contractor;	To be updated.	CEMP	Applicant/ Contractor
48			Liaison and planning	Where required, ducting will be provided to allow for the provision of services (electrical/water) across severed areas unless otherwise agreed with the asset owner and where practicable;	To be updated.	CEMP	Applicant/ Contractor
49			Ducting	Any disruption to water supply will be reinstated immediately by the Contractor or an alternative source supplied until the source is reinstated, unless otherwise agreed with the landowner or Uisce Éireann as appropriate;	To be updated.	CEMP	Applicant/ Contractor
50			Liaison and planning	Prior to commencement of construction works the Contractor will be required to engage with all built services providers. The Contractor will continue liaison with providers as required throughout the construction phase;	To be updated.	CEMP	Applicant/ Contractor
51				Prior to any mechanical excavation taking place, there will be consultation with ESB Networks to establish and verify the exact locations of all underground electricity cables. Gas Networks Ireland (GNI) will also be consulted, and the exact position of the two gas transmission gas pipelines will be verified prior to works commencing; and	To be updated.	CEMP	Applicant/ Contractor
52				All work being conducted in the vicinity of underground services will be completed in accordance with the current Health and Safety Authority (HSA) 'Code of Practice for Avoiding Danger from Underground Services'. Furthermore, the ESB Code of Practice and HSA guidance, including the 'Code of Practice for Avoiding Danger from Overhead Electricity Lines', regarding exclusion and safe operating distances around electricity infrastructure will be adhered to. Height restriction barriers and equipment will be used to demark electrical infrastructure.	To be updated.	CEMP	Applicant/ Contractor
53	Resource and Waste Management	Chapter 30	Waste management	Any waste and/or coastal litter arising from the construction, operation and maintenance, and decommissioning phases of the Project will be managed in accordance with the current national waste policy. Any waste and/or coastal litter that cannot be prevented or reused will be deposited at an appropriate facility;	To be updated.	CEMP	Applicant/ Contractor
54			Notification of waste or hazardous material	If any unforeseen waste or hazardous material is encountered during the course of the Project, the EPA will be notified, and the material will be deposited at an appropriate waste facility	To be updated.	CEMP	Applicant/ Contractor
55			Waste manager	A Waste Manager will be nominated who will have overall responsibility for the implementation of all waste processes. In conjunction with this, a clear responsibility structure will be introduced in the Project team to ensure difficulties encountered are raised at an appropriate level and acted upon.	To be updated.	CEMP	Applicant/ Contractor
56			Records of waste	Records will be kept on the quantity nature/type and quality of all waste leaving the site.	To be updated.	CEMP	Applicant/ Contractor
57			Waste management	<ul style="list-style-type: none"> •The management of waste generated by the Project will reflect the waste management hierarchy, with waste prevention and minimisation being the priority succeeded by reuse and recycling. Where there are opportunities for the beneficial reuse and recycling of materials, these will be considered; •Excess material will be made available for reuse off-site. It is anticipated that the available material will be a clean and valuable resource capable of meeting the specifications of a typical Class 1 material. This material can be reused in local projects under development, assuming by-product classification can be achieved. Alternatively, the material can be recovered at quarries in the local area and beyond. The availability of the material and the scheduling of local construction projects will be kept under review as the project develops. If reuse of surplus material is not possible, it will be sent for appropriate recovery. Any site identified for recovery of soil and stone will require the appropriate planning permission and waste authorisation in place to accept the material on-site; •Sustainable practices will be implemented when choosing materials to be used in the construction of the Project, including the use of cement containing high levels of GGBS or recycled steel (see volume 2C, chapter 17: Climate for further detail relating to sustainable materials); 	To be updated.	CEMP	Applicant/ Contractor
58			Waste management plan	All Contractors (and their Sub-Contractors) will produce a Waste Management Plan (WMP), providing details of all waste management procedures for their activities and details of expected waste arisings and proposed procedures for waste management. The Contractor's Environmental Manager will be responsible for the compilation of this document which will implement all the measures outlined in section 5.15 of the CEMP.	To be updated.	CEMP	Applicant/ Contractor



ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Appendix 5-2: Environmental Management Plan

MDR1520B
EIAR – Appendix 5-2
A1 C01
March 2024

ORIEL WIND FARM PROJECT – ENVIRONMENTAL MANAGEMENT PLAN

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Acronyms

Term	Meaning
ADD	Acoustic Deterrent Device
AEZ	Archaeological Exclusion Zone
CLM	Community Liaison Manager
CV	Curriculum Vitae
ECoW	Environmental Clerk of Works
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
FLO	Fisheries Liaison Officer
HWM	High Water Mark
IEMA	Institute for Environmental Management and Assessment
IFI	Inland Fisheries Ireland
MAC	Maritime Area Consent
MARPOL	International Convention for the Prevention of Pollution from Ships
MMO	Marine Mammal Observer
MPCP	Marine Pollution Contingency Plan
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OFLO	Offshore Fisheries Liaison Officer
OSS	Offshore Substation
OWL	Oriel Wind Limited
PAM	Passive Acoustic Monitoring
RAMS	Risk Assessment Method Statements
SEAR	Safety and Environmental Awareness Report
TII	Transport Infrastructure Ireland
WMP	Waste Management Plan

ORIEL WIND FARM PROJECT- ENVIRONMENTAL MANAGEMENT PLAN

1 INTRODUCTION

1.1 Purpose

This Environmental Management Plan (EMP) has been prepared by RPS and Oriel Windfarm Limited (OWL) (the Applicant) to support the Environmental Impact Assessment Report (EIAR) for the Oriel Wind Farm Project (hereafter referred to as “the Project”).

The EMP will form part of the Oriel Offshore Works Contract. The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by the Contractor in developing construction method statements and other plans relating to environmental management as required by the Contract.

This version of the EMP (Version 1.0) presents minimum environmental management requirements to be adhered to by the Contractor. This EMP will be further developed and updated following receipt of planning consent to incorporate relevant planning conditions and further details on environmental management measures to be applied during the construction phase. The EMP will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented.

The EMP will be submitted and agreed with the relevant consenting bodies prior to construction commencing. The Contractor will submit all relevant information as detailed in this document to the Employer for acceptance in accordance with the contract provisions. No construction works will commence prior to the Employer’s acceptance.

The EMP will provide:

- A practical tool for managing the potential environmental impacts of the Project;
- Guidance on how to prevent and/or mitigate potential environmental impacts; and
- A Framework for measuring and improving environmental performance.

The EMP will form the minimum standard for all relevant OWL personnel, contractors and subcontractors to comply with. Contractors and subcontractors must take account of the requirements contained within this EMP when developing their task-specific Risk Assessment Method Statements (RAMS).

This EMP has been prepared in accordance with industry good practice guidance including:

- Institute for Environmental Management and Assessment (IEMA) Guidance on Environmental Management Plans (IEMA, 2008); and
- Transport Infrastructure Ireland’s (TII) Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (2007).

1.2 Scope

The remit of the EMP is for the Project activities taking place seaward of the High-Water Mark (HWM). The EMP is applicable to all OWL personnel, contractors and subcontractors carrying out construction and operational and maintenance activities associated with the Project.

The EMP does not apply to the Oriel Wind Farm Project onshore infrastructure (i.e. landward of the HWM). a separate CEMP has been developed for these elements of the Project (see appendix 5-1: Construction Environmental Management Plan in volume 2A of the EIAR).

ORIEL WIND FARM PROJECT- ENVIRONMENTAL MANAGEMENT PLAN

1.3 Aims and objectives

The EMP will be a key construction contract document, which will ensure that all mitigation measures and commitments made within the EIAR and Natura Impact Statement (NIS), which are considered necessary to protect the environment, during the construction and operation and maintenance of the Project, are implemented.

The principal objective of this document is to provide information on the Project and to detail appropriate measures for the avoidance, minimisation and control of adverse environmental impacts associated with the Project as identified in the EIAR.

The EMP will form part of the Offshore Works Contract (hereafter, the Contract) for the construction phase of the Project. Likewise, the relevant details included in the EMP will also be adopted during the operational and maintenance phase of the Project. The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by both OWL and Contractor personnel in developing and refining the detailed design, construction method statements and other plans relating to environmental management as required throughout construction and operation.

This version of the EMP presents minimum environmental management requirements to be adhered to by the Project.

This EMP will be updated prior to construction, during construction, and prior to commencement of the operational and maintenance phase to focus and detail key aspects of the relevant stage of the Project life cycle. Updates will incorporate any further environmental requirements and details on environmental management measures to be applied during the construction and operational and maintenance phases of the Project.

This document should be read and implemented in conjunction with the EIAR and industry good practice, published guidance documents, and other documents, referred to within the EMP.

1.4 Document structure

The EMP is divided into three parts:

- Part I – Management, Implementation and Communication: provides information on the management and implementation of the EMP, including roles and responsibilities, and lines of communication (see section 2);
- Part II – Environmental Impacts and Control Measures: provides a register of potential environmental impacts identified within the EIAR and associated control measures (see section 3); and
- Part III – Annexes: provides relevant supporting information, including the OWL Environmental Policy, reporting proformas and procedures (see section 4).

1.5 Other relevant documents

The EMP is supported by a number of management plans which focus on key aspects of the environmental management of the Project. Some of these documents are included in the EMP as an annex while other stand-alone documents and are appended separately to the EIAR. The other relevant documents are listed below:

- Marine Pollution Contingency Plan (see Annex 2);
- Marine Invasive Non-native Species Management Plan (see EIAR, volume 2A, appendix 5-3);
- Marine Megafauna Mitigation Plan (see EIAR, volume 2A, appendix 5-4);
- Marine Megafauna: Vessel Code of Conduct (see EIAR, volume 2A, appendix 5-5);

ORIEL WIND FARM PROJECT- ENVIRONMENTAL MANAGEMENT PLAN

- Fisheries Management and Mitigation Strategy (see EIAR, volume 2A, appendix 5-6);
- Emergency Response Co-operation Plan (see EIAR, volume 2A, appendix 5-7); and
- Lighting and Marking Plan (see EIAR, volume 2A, appendix 5-8).

It is important to note that the EMP and the other relevant documents listed above will be developed further in preparation for construction once the detailed project design for the Project is available and any post-consent requirements become available.

At this stage, the documents are intended to capture the requirements of the EIAR to ensure that the associated environmental management measures are built into these plans, procedures and strategies from an early stage and brought forward into the further phases of construction and operation and maintenance. These documents will continuously evolve and will be reviewed at regular intervals throughout the Project, including the operational and maintenance phase. However, the commitments made in the EIAR and any associated conditions of consent or requirements agreed with the relevant authorities will always form the basis of these documents.

1.6 Description of the Project

The Project is an offshore wind farm project situated off the coast of County Louth to the east of Dundalk Bay approximately 22 km east of Dundalk town centre, 18 km east of Blackrock, 5 km south of the Cooley Peninsula and 10 km northeast of Dunany Point. It comprises 25 wind turbine generators (WTGs), one offshore substation (OSS), a single offshore cable which will extend from the offshore wind farm area to a landfall approximately 700 m to the south of Dunany Point, and a network of inter-array cabling. The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore wind farm area covers approximately 27.7 km² and is broadly hexagonal in shape with a length of approximately 5.3 km west to east and 6.7 km north to south (see Figure 1-1).

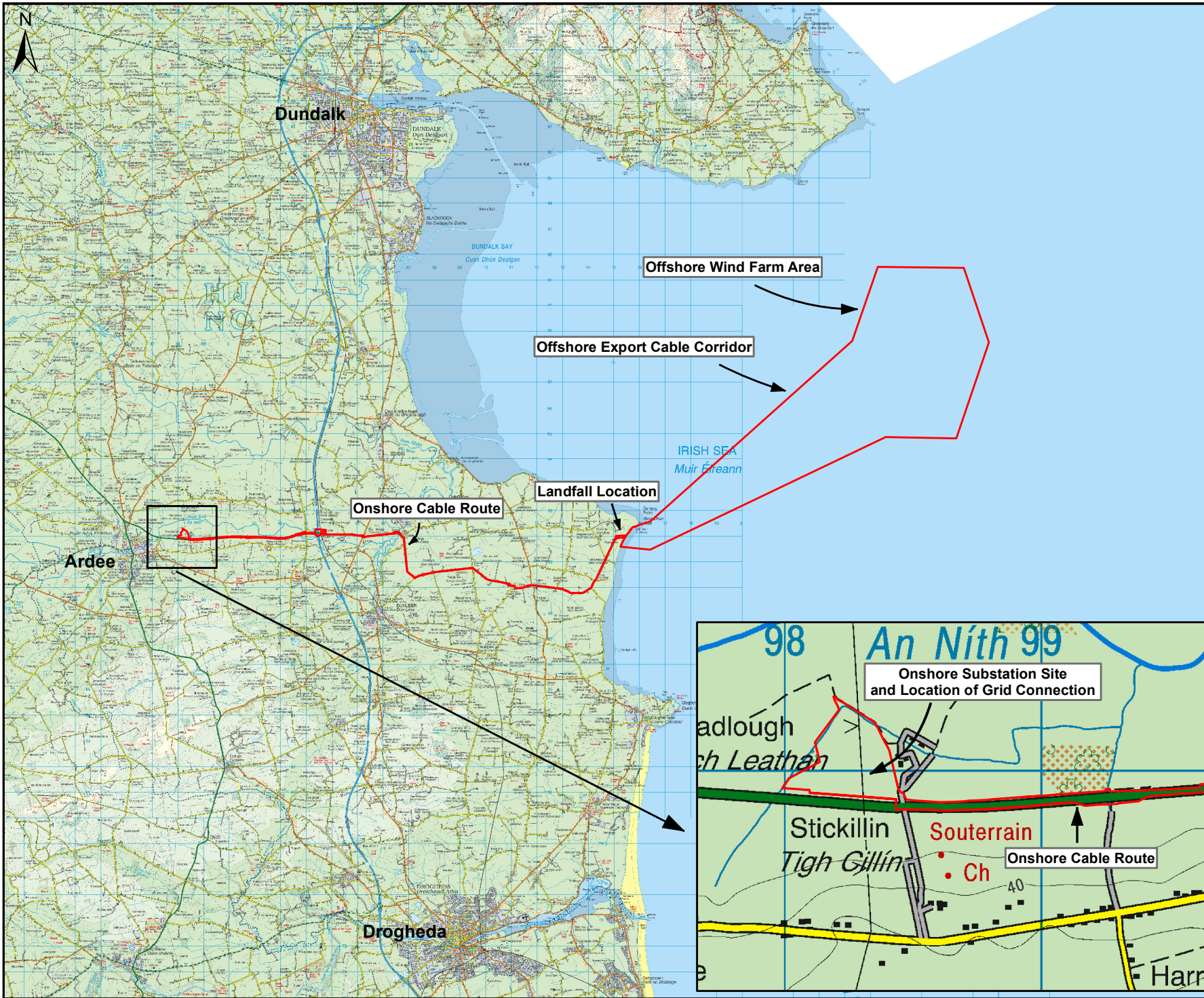
1.7 Consents

To develop the Project, OWL require a consent for the Project under the Planning and Development Act 2000, as amended.

OWL also hold a Maritime Area Consent (MAC).

A Dumping at Sea Permit will also be required for the construction of the offshore infrastructure.

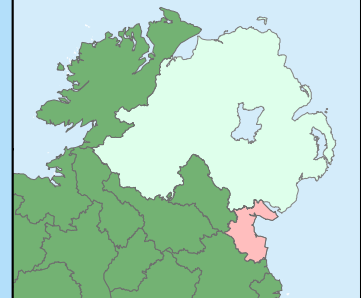
[Hold: Other consents that may be required prior to construction to be outlined here].



Legend

— Planning Application Boundary

Data Sources: OWL, OSI.



Client



Project

Oriel Wind Farm Project

**Figure 1-1:
Overview of Oriel Wind Farm Project**

rps West Pier Business Campus,
Dun Laoghaire,
Co Dublin,
Ireland.
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Issue Details

Drawn By: MV	Project No. MDR1520b
Checked By: CC	File Ref:
Approved By: CC	MDR1520bArc3072P01
Scale: 1:200,000 @ A4	Projection: ITM (IRENET95)
Date: 19/04/2023	Geographic Co-ordinates: ETRS89

NOTE: 1. This drawing is the property of RPS Group Ltd. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. All levels are referred to Ordnance Datum, Malin Head.
3. Ordnance Survey Ireland Licence CYAL50319610
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2 PART I: MANAGEMENT, IMPLEMENTATION AND COMMUNICATION

2.1 Roles and responsibilities

2.1.1 Overview

This section of the EMP outlines the roles and responsibilities of all relevant OWL personnel, Contractors and Subcontractors in relation to the EMP.

All OWL personnel, contractors and subcontractors will have a responsibility to comply with the requirements of the EMP and all relevant supporting documents. The key roles relevant to the delivery and implementation of the EMP are:

- OWL Project Manager;
- OWL Environmental Manager;
- OWL Environmental Clerk of Works (ECoW);
- OWL Community Engagement Manager;
- Contractors and Subcontractors (including Contractor Environmental Manager and Contractor Community Liaison Officer); and
- Supporting Environmental Roles.

These roles are outlined in section 2.1.2 below and will be further developed in the EMP to be submitted for approval to the competent authority post-consent. A table providing a summary of all tasks and responsibilities of OWL personnel, contractors and subcontractors will be prepared to support Part 1 prior to construction.

2.1.2 Key OWL management roles relating to environmental management

OWL Project Manager

A Project Manager for the construction phase of the Project will have overall responsibility for ensuring ongoing compliance with the EMP and all supporting documents, including the EIAR and the consents management plans listed in section 1.5, during this phase of the development. The Project Manager for the construction phase will be supported by Package Managers who will lead and manage the delivery of engineering work packages covering marine installation, turbines and transmission systems during construction. The Package Managers have similar responsibilities to the Project Manager for the construction phase, but in relation to their specific packages of work.

Similarly, the Project Manager for the operational and maintenance phase of the Project (or Operation and Maintenance Manager) will have day to day responsibility for ensuring ongoing compliance with the EMP and all supporting documents, including the EIAR and the consents Management Plans listed in section 1.5, during this phase of the Project. The Project Manager for the Operation and Maintenance phase will be supported by a Management and Supervisory Team who will lead and manage the tasks and activities associated with the operation and maintenance of the Project. This team will have similar responsibilities to the Project Manager for the Operation and Maintenance phase, but in relation to their specific areas of work.

The Project Manager is responsible for the appointment of an OWL Environmental Manager and a Community Engagement Manager to the Project.

The key responsibilities of the Project Manager relating to the environmental management of the Project are outlined below.

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- Ensuring that their environmental responsibilities, as described in the EMP and supporting documents such as the consent management plans, are fulfilled for the duration of the Project;
- Establishing contractual obligations for Contractors/Subcontractors in relation to EMP;
- Responsible for ensuring that sufficient resources and processes are in place to deliver/comply with the EMP and to manage potential environmental impacts;
- Ensuring that environmental management issues are dealt with as a priority in project progress meetings and project inductions and training for the Project;
- Ensuring that all project personnel and Contractors/Subcontractors assist and support the OWL Environmental Manager (and supporting roles) where required;
- Ensuring that any corrective actions arising from environmental audits are addressed;
- Reporting to the OWL senior management; and
- Addressing Contractor and Subcontractor non-compliance.

A more detailed breakdown of the OWL Senior Management Team for the construction phase and operational and maintenance phase will be included in the EMP when the document is refined prior to commencement of construction.

OWL Environmental Manager

The OWL Environmental Manager will appoint an appropriately qualified and competent environmentalist or ecologist as the OWL ECoW to assist in the day to day environmental management and compliance of the construction phase of the Project with the EIAR, EMP and supporting environmental documentation.

The key responsibilities of the OWL Environmental Manager in relation to the EMP include the following:

- Ensuring that their environmental responsibilities, as described in the EMP and supporting documents such as the consent management plans, are fulfilled for the duration of the Project;
- Review and final approval of any revisions to the EMP and supporting documentation provided by the Contractor during construction and the continued refinement of the EMP during the operational and maintenance phase;
- Conducting environmental inspections and audits to ensure works and operations are carried out in compliance with the EIAR, EMP and supporting environmental documentation;
- Review and approval of an environmental compliance monitoring programme compiled by the Contractor prior to commencement of construction, and ensuring monitoring is taking place and environmental reports and records are generated and maintained;
- Ensuring the environmental compliance monitoring programme is expanded and carried through to the operational and maintenance phase of the Project. The OWL Environmental Manager will also ensure that any operational environmental compliance monitoring and reporting requirements are fulfilled;
- Promoting a positive environmental culture and increasing environmental awareness throughout the construction and operational and maintenance phases of the Project;
- Ensuring that, during construction, the Contractor is communicating statutory requirements and good environmental practices outlined in the EMP, principally via a schedule of toolbox talks informed by site activities and recorded non-compliance. The OWL Environmental Manager will ensure this task is also undertaken during the operational and maintenance phase of the Project;
- Attendance at project meetings, providing environmental input where required;

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- Reviewing Contractor and Subcontractor documentation (including RAMS and reports) to ensure compliance with the EIAR, EMP and supporting environmental documentation; and
- Liaising with the competent authority and relevant stakeholders on matters relating to the environment, as required.

OWL Environmental Clerk of Works (ECoW)

The ECoW will be primarily a construction related position but will be called upon when necessary during the operational and maintenance phase of the Project.

The ECoW will report to the OWL Environmental Manager and will work closely with all project personnel, including the Contractor Environmental Manager on matters relating to the environment and will alert them of any environmental issues arising.

General responsibilities for the ECoW include, but are not limited to, the following:

- Ensuring that their environmental responsibilities, as described in the EMP and supporting documents such as the consent management plans, are fulfilled for the duration of the Project;
- Maintain an environmental presence during construction to ensure the Contractor and Subcontractors are fulfilling their responsibilities relating to the EIAR, EMP and supporting environmental documentation;
- Review and Quality Assurance of the EMP (and all Consents Management Plans and Programmes) provided by the Contractor;
- Provision of advice to the Project on compliance with consent conditions, where required;
- Attendance at project meetings, providing environmental input where required;
- Provide support to the OWL Environmental Manager when liaising with stakeholders as required;
- Reviewing Contractor documentation (e.g. Method Statements and Risk Assessments) to ensure compliance with the EMP and associated Annexes; and
- Carry out on-site environmental audits to monitor Contractor compliance with the requirements of the EIAR, EMP and supporting environmental documentation.

OWL Community Engagement Manager

This dedicated role is in place right through the pre-construction and construction phases of the Project to facilitate engagement with the community. The Community Engagement Manager will work closely with the Community Liaison Manager appointed by the Contractor during construction.

2.1.3 Contractors and subcontractors

OWL personnel will oversee all work carried out by Contractor and Subcontractor staff. The Contractor and all Subcontractors will adhere to the requirements of the EIAR and EMP and ensure their work is carried out in line with good environmental practice.

The Contractor will refine the EMP as required throughout the Construction phase of the Project.

During the construction phase of the Project, the Contractor will employ a Contractor's Environmental Manager with appropriate experience and expertise for the duration of the Construction phase. The Contractor's Environmental Manager will ensure that all the environmental design, control, management and mitigation measures outlined in the EIAR, EMP and supporting consent documentation are implemented on the Project. Competency of the Contractor's Environmental Manager will include a minimum of 5 years site experience which is demonstrated via submission of relevant information (e.g. CV, training records,

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membership records) for acceptance by the OWL Environmental Manager prior to commencement of construction works.

The Contractor will also employ a Contractors Community Liaison Manager (CLM) to engage with the local community throughout the construction phase of the Project.

All contractors to OWL (and their subcontractors) will ensure that their own procedures comply with the requirements of the EIAR and EMP. Key responsibilities in relation to the EMP include the following:

- Ensuring that their environmental responsibilities, as described in the EMP and supporting documents such as the consent management plans, are fulfilled for the duration of the Project;
- Ensuring that sufficient resources and processes are in place to comply with the EMP and to manage the potential environmental impacts of their activities;
- Prepare and provide RAMS for all works and tasks prior to these being undertaken. These documents take into account and address all of the environmental aspects of any planned works and will include proposed mitigation measures. RAMS will be provided to the OWL Environment Manager at least one week in advance of such works starting;
- Implementing the required environmental control measures outlined in the EIAR, EMP and supporting environmental documentation;
- Read, understand and comply with any consent condition in relation to their activities;
- Maintain regular dialogue with the OWL Environmental Manager/OWL ECoW and inform them of any environmental risk or incident or environmental queries without delay;
- Undertake environmental monitoring, inspection and reporting, including collecting and collating all required data, as required by the OWL Environmental Manager;
- Ensure that all personnel under their control are competent and carry out their tasks in compliance with the EMP;
- Adhere to relevant environmental legislation and carry out their duties in compliance with project environmental policies, plans, procedures and rules for the Project; and
- Ensure their staff receive suitable environmental induction and training prior to undertaking any work on the Project.

This EMP will form the minimum standard for all contractors and subcontractors to comply with. Additional control measures may be identified by contractors during review of their own activities and these must be specified in their RAMS.

Contractor's Environmental Manager

The Contractor's Environmental Manager will have a minimum of 5 years of relevant site experience and will be a full-time role from the start of project contract award to ensure compliant set-up of site activities.

The Contractor's Environmental Manager will be responsible for:

- Ensuring that their environmental responsibilities, as described in the EMP and supporting documents such as the consent management plans, are fulfilled for the duration of the Project;
- The EMP and supporting environmental documentation and ensuring these documents are reviewed and refined at regular intervals throughout the construction phase of the Project. The Contractor's Environmental Manager will ensure these documents remain consistent with the EIAR and include any environmental requirements introduced through the consents process. Any revisions to the EMP and

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supporting environmental documentation must be circulated to the OWL Environmental Manager for review and approval;

- Carrying out environmental audits, inspections and associated reporting to ensure construction works are carried out in compliance with the EIAR, EMP and any supporting environmental documentation;
- Compilation of an environmental compliance monitoring programme, conducting environmental compliance monitoring as required and compilation of relevant environmental reports and records. The environmental compliance monitoring programme and any environmental reports and records must be circulated to the OWL Environmental Manager for review and final approval;
- Developing a positive environmental culture via training and engagement with site management and, importantly, site operatives to increase awareness and promote timeous remediation/reporting;
- Communicating statutory requirements and good environmental practices outlined in the EMP, principally via a schedule of toolbox talks informed by site activities and recorded non-compliance;
- Communicating the requirements of the EMP to contractors and subcontractors;
- Monitoring and tracking the implementation of the EMP and ongoing compliance;
- Provision of advice contractors and subcontractors on compliance with the EMP; and
- Inducting site personnel on the site/works environmental policy and procedures and the requirements of the EMP.

Contractor's Community Liaison Manager (CLM)

The Community Liaison Manager will be appointed by the Contractor and will be responsible for managing tasks such as the following:

- Alerting neighbouring residents of the works or particular activities commencing in their area;
- Briefing neighbours on progress and issues likely to affect them, such as piling works resulting in noise, as necessary;
- Liaison with Louth County Council and emergency services as appropriate; and
- Liaison with local Gardaí, where necessary.

The Contractors CLM will liaise closely with the OWL Community Engagement Manger and seek their prior approval before engagement with the local community.

2.1.4 Supporting environmental roles

Retained archaeologist

The retained archaeologist will be responsible for advising on all archaeological matters relating to the Project that might impact on archaeological and cultural heritage resources. The archaeologist will be the initial point of contact for the OWL Environmental Manager on matters relating to archaeology.

The archaeologist will:

- Oversee the implementation of the Marine Archaeology Management Plan (see EIAR appendix 5-10);
- Brief the OWL Environmental Manager on the nature of any archaeological finds and features and appropriate measures for interim conservation and safe storage;

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- Advise on the identification of finds and features of interest and, if possible, the character of their seabed locations;
- Advise on material conservation of any recovered finds;
- Agree appropriate actions to be taken; and
- Where appropriate, pass on all details and records associated with any discoveries to the NMS.

Marine Mammal Observer (MMO)

A qualified and experienced Lead MMO (supported by other MMOs as required) will be appointed to monitor for the presence of marine mammals in advance of and during piling activities (see also appendix 5-4: Marine Megafauna Mitigation Plan).

During daylight hours at least two dedicated and qualified MMOs will be used to search a defined mitigation zone and conduct the pre-start searches from a survey vessel prior to the start of the piling. Visual monitoring for marine mammals will be conducted from a suitable platform on the vessel such as the ship's bridge, that allows visualisation for 360-degrees, and full coverage of the mitigation zone. MMOs must concentrate their efforts on the measures to be taken in advance of and during commencement, breaks in and resumption of the sound-producing activity (NPWS, 2014).

The MMO will be equipped with reticule binoculars and marine mammal reporting forms and will be capable of determining the extent of the mitigation zone in relation to their viewing platform. A range stick may be used to aid the estimation of distance of the sighting from the survey vessel. The MMO will be responsible for recording all marine mammal sightings in the appropriate format, along with other environmental data. Together with the PAM Operator, the MMO will be responsible for compiling all data on marine mammal observations and mitigation activities for reporting to NPWS.

The MMO must be experienced and familiar with the Irish regulatory procedures and be provided with full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement, in order to ensure compliance. The MMO will have the necessary authority (or support by Works Superintendent) to implement the protocol and stop works if necessary.

Passive Acoustic Monitoring (PAM) Operator

PAM will be undertaken during pre-start, ramp-up and piling activities. A vertical PAM system will be used, as opposed to a towed system as the vessels are likely to use dynamic positioning rather than transiting during the pre-start monitoring phase.

Two dedicated and qualified PAM Operators will be responsible for deployment, maintenance and operation of the PAM hydrophone, including spares. Both PAM Operators will be suitably trained in passive acoustic monitoring and the use of PAMGuard, with training having been provided by an appropriate organisation (e.g. Seiche). PAM Operators will also have an appropriate level of field experience (i.e. a minimum of one-year PAM experience on offshore projects).

PAM Operators will be based on the vessel together with the MMO. PAM Operators will be responsible for recording all acoustic marine mammal detections in the appropriate format, and together with the MMO, will be responsible for compiling all data on marine mammal observations and mitigation activities for reporting to NPWS.

PAM Operators must be experienced and familiar with the Irish regulatory procedures and be provided with full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement, in order to ensure compliance. PAM Operators will have the necessary authority (or support) to implement the protocol and stop works if necessary.

Acoustic Deterrent Device (ADD) Operator

A trained and dedicated ADD operator will be responsible for ADD maintenance, operation and reporting. The ADD Operator will be responsible for deploying the ADD from the installation vessel, verifying the

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operation of the ADD before deployment, operating the ADD, ensuring that batteries are fully charged and that spare equipment is available. The ADD Operator should also record and report on all ADD and piling activity so the details of any Acoustic Deterrent Devices used and any relevant observations on their efficacy can be reported as a part of the Operational/Marine Mammal Observer/Passive Acoustic Monitoring Report.

Fisheries Liaison Officer (FLO)

The primary responsibilities of the FLO include the following:

- To be the key point of contact for fisheries stakeholders;
- To identify individual commercial vessels and skippers operating in areas relevant to the Project;
- To establish and maintain a strong working relationship with the fishing industry;
- To identify potential interactions of the Project and its associated activities on fishing operations; and
- To communicate clearly and accurately with the fishing industry on behalf of the Applicant.

In addition, the FLO will be expected to undertake the following duties:

- To maintain a fisheries stakeholder database including vessel descriptions, information on fishing methods deployed, skipper's concerns and contact details;
- To organise meetings with fisheries stakeholders and maintain regular liaison with local fisheries stakeholders as required;
- To prepare and distribute information and notices with regard to the Project and related activities that could potentially interact with fisheries stakeholders;
- To gather information on the fishing activities that take place within and around the Project;
- To identify and communicate to the Applicant relevant fishermen's concerns and sensitivities in respect of the various activities associated with the Project; and
- To act as an OFLO, where appropriate.

Offshore Fisheries Liaison Officer (OFLO)

OFLOs are placed onboard main survey and construction vessels to act as the point of communication with fisheries stakeholders at sea.

The primary responsibilities of OFLOs will include:

- To maintain regular contact with the FLO and the Applicant and/or their contractors, as appropriate, concerning fishing vessel activity around the Project;
- To keep the masters and watch officers of survey and construction vessels informed of fishing vessels operating in the vicinity of their vessel's working areas, and the gears and modes of operation of such vessels;
- To communicate with the vessel master in respect of providing relevant information to fishing vessels, such as vessel locations, operations, schedule of works and advisory safety zones;
- To liaise with fishermen who may have static gear deployed in the proximity of the Project, around advisory safety zones and vessel transit routes; and
- To work with the vessel master to ensure adherence to relevant aspects of the Fisheries Management and Mitigation Strategy.

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Marine Coordinator

Prior to commencement of construction, a Marine Coordinator will be appointed to the Project Team. The main responsibility of the Marine Coordinator will be to coordinate the day-to-day vessel activity on the Project. In addition, the Marine Coordinator will also provide a supporting role in fulfilling the requirements of the EMP and relevant consent management plans. Their key responsibilities relating to these documents include the following:

- In the event that an archaeological find is thought to have been discovered in a particular area, the Marine Coordinator will advise/inform other vessels working in proximity to this area of the potential find; and
- In the event of a pollution incident originating from a vessel or vessel related activity, the Marine Coordinator will assist with the coordination and execution of the ongoing response maintaining close communication with OWL (including the OWL Project Manager and OWL Environmental Manager/OWL ECoW) and relevant Contractors/subcontractors. Where a spill is from a project installation, the Marine Coordinator will oversee the spill response and any clean-up operations.

2.1.5 Contact details

Prior to commencement of construction, a project Contacts Sheet will be compiled which will provide a list of all OWL, Contractor/Subcontractor and relevant third-party contact details. The Contacts sheet will be made available to the Project Team and will be updated regularly throughout construction and operation. The Project Contacts sheet will include the following details as a minimum:

- Company / Organisation;
- Position;
- Name;
- Tel / Mobile No.;
- Email; and
- Office Location.

2.2 Communications and reporting

Prior to and during construction and operational and maintenance activities, OWL will hold regular progress meetings, involving the OWL Environmental Manager (and ECoW where required) and relevant Contractors and Subcontractors, including the Contractor's Environmental Manager where required. The agenda for progress meetings will include a section on environmental management and consents compliance, to be presented by the OWL Environment Manager and/or the Contractor's Environmental Manager.

Contractor risk assessment and method statements will be reviewed by the OWL Environment Manager/OWL ECoW. Contractors and/or subcontractors will be provided with copies of the relevant consents by the OWL Environmental Manager and made aware of the consent obligations associated with a particular activity.

All OWL personnel, contractors and subcontractors will be encouraged to report any environmental concerns or issues to the OWL Environment Manager/OWL ECoW immediately. A Safety and Environmental Awareness Report (SEAR) will be completed for all potential (near miss) or actual environmental incidents or emergencies which occur on site.

2.3 External communications

OWL will carry out external communications, notifications and reporting in relation to Project activities in line with the commitments made in the EIAR and in compliance with the requirements of the consent conditions.

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2.3.1 Incident reporting

Environmental incidents

For spill/pollution reporting procedures, refer to the Marine Pollution Contingency Plan (MPCP) provided in Annex 2.

The procedure to be followed in the event of an environmental incident (excluding marine pollution incidents) is provided in Annex 3: Environmental Incident Reporting Procedure (excluding oil spills).

2.3.2 Dropped objects

All dropped objects will be recorded and reported to the competent authority using a Dropped Object Procedure Form. An indicative form is included in Annex 4 of the EMP. The final form format will be agreed prior to commencement of construction activities.

2.4 Training, auditing and change management

2.4.1 Competence, training and change management

OWL will ensure that contractors and subcontractors have appropriate environmental management resources and procedures in place. The OWL Environmental Manager will evaluate Contractor compliance with environment and consents requirements and will review appointed contractor documentation (e.g. RAMS) to ensure compliance with the EMP.

During construction, the Contractor's Environmental Manager is responsible for delivering environmental training and promoting awareness in relation to environmental management through various means including;

- Inductions;
- Toolbox talks; and
- Awareness materials.

Further details on the information to be included in these methods are shown in Table 2-1.

The Contractor's Environmental Manager will ensure that a dedicated section is included within wider contractor project inductions for the Project to cover environment and consents issues, highlighting the key environmental sensitivities and considerations. All OWL personnel, contractors and subcontractors will receive a project induction.

The Contractor's Environmental Manager will also deliver specific training on the purpose, requirements and procedures of the EMP and associated Annexes, through a series of toolbox talks. Toolbox talks will be designed to convey key points to project personnel in a clear and concise manner (IEMA, 2008). Toolbox talks will also be scheduled in advance of specific construction or operational and maintenance activities (for example, piling activities), identifying specific control measures and mitigation requirements.

In addition to presentations and talks, the Contractor's Environmental Manager will prepare a series of awareness materials, which may include training packs, posters, signs and newsletters.

Training will take place regularly throughout the lifetime of the Project in order that project personnel (including any new personnel) are kept up to date with any changes to requirements or procedures. A record of the training will be maintained by the Contractor's Environmental Manager.

The OWL Environmental Manager will assume responsibility for the provision of environmental training and promoting awareness to project personnel during the operational and maintenance phase of Project. The OWL Environmental Manger may delegate these responsibilities to a Contractor, if appropriate, during the operational and maintenance phase of the Project.

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Table 2-1: Methods of environmental training and promoting environmental awareness.

Tools to deliver environmental training and promote environmental awareness

1 Inductions	<p>To ensure that OWL personnel and all contractor employees, sub-contractors, suppliers, and other visitors to the site are made aware of the content of the EMP that is applicable to them. Accordingly, environmental specific induction training will be prepared and presented to all categories of personnel working and visiting the site.</p> <p>As a minimum, the following information will be provided to all inductees:</p> <ul style="list-style-type: none"> • Identification of specific environmental risks associated with the work to be undertaken onsite by the inductee; • Summary of the main environmental aspects of concern at the site; • Species and/or habitat protection requirements; • Archaeological safeguarding measures, e.g. Archaeological Exclusion Zones (AEZs), contact details for the retained archaeologist; • Pollution prevention measures; • Waste management (including littering); and • Plant service and repair procedures, including the disposal of waste oils and service components. <p>Based on survey data and verification survey data collected throughout the planning and pre-commencement phases, OWL will provide an Environmental Constraints Map illustrating constraints by environmental sensitivities (e.g. archaeological exclusion zones). OWL will update the map as required, prior to commencement of the Project and will provide these maps to the Contractor.</p> <p>Informed by the Environmental Constraints Maps, the Contractor will generate an Environmental Risk Map illustrating environmentally sensitive areas and potential sources of pollution. The Environmental Risk Map will be used during the induction and prominently displayed in the relevant areas. In consultation with the OWL Environmental Manager, the Contractor will update the map as required. Any update will trigger a toolbox talk to clearly communicate the change and offer opportunity for any necessary clarifications.</p>
2 Toolbox Talks	<p>In order to provide on-going reinforcement and environmental awareness training, the above topics (see Inductions), along with any other environmental issues which arise onsite, will be discussed at regular toolbox talks.</p> <p>Toolbox talks and training will be delivered by specialist personnel onsite (e.g. Contractor's Environmental Manager) as required.</p> <p>A schedule for toolbox talks will be provided at least one week prior to commencement of works. The proposed schedule – to be considered as a live document – shall be consistent with the programme of works or operational tasks and activities. Additional toolbox talks shall be added as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc.</p> <p>Specifically, as a minimum, the following environmental training will be provided by competent staff/contractors:</p> <ul style="list-style-type: none"> • Training on the use of spill kits (onboard vessels and in water), to be provided on a regular basis (to account for staff/subcontractor changes etc). <p>Other toolbox talk topics will include but are not necessarily limited to the following:</p> <ul style="list-style-type: none"> • Waste management, including waste storage, waste segregation and littering; • Control of fuel and refuelling, and fuel handling procedures; and • Ecologically and archaeologically sensitive areas. <p>A record of all toolbox talks and training will be maintained by the Contractor. All records will be made available to OWL Environmental Manager if requested.</p>
3 Awareness materials	<p>Environmental notice board(s) will be maintained and will be positioned to ensure that all operatives have the opportunity to review a notice board on a daily basis. As a minimum this will include one notice board in each vessel congregation area.</p>

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Tools to deliver environmental training and promote environmental awareness

During construction, the environmental notice boards will be maintained by the Contractor and shall be updated at least monthly. As a minimum, the notice boards will contain:

- Description of the key environmental risks and intended risk mitigation measures, together with accompanying Environmental Constraints/Risk Map illustrating the location of the key risks and required exclusion zones/buffer zones and location of emergency response equipment; and
- Key contact numbers and responsible personnel.

Environmental labelling and signage will also be used onsite to inform project personnel of any key environmental requirements or restrictions, including information to assist good environmental practice across the site.

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2.4.2 Monitoring and audits

The primary monitoring tool available for the Project will be the Commitments Register (see Annex 5). The Commitments Register will provide a log of all commitments made within the EIAR, planning conditions and post consent consultations to be adhered to throughout the lifetime of the Project. The purpose of the register is to provide a tool intended for use by both OWL Environment Manager and any Contractors/Subcontractors working on the Project to track compliance with commitments and to provide a record and audit trail of compliance across the construction and operational and maintenance phases of the Project. The Contractor's Environmental Manager is responsible for compiling and updating the Commitments Register prior to commencement of construction and will circulate to the OWL Environmental Manager for review and approval. The Contractor's Environmental Manager will maintain the commitments register throughout the construction phase of the Project. The OWL Environmental Manager will review and update the register prior to the operational and maintenance phase and is responsible for the maintenance of the register throughout this period.

Compliance with the EMP will be monitored through a series of audits carried out by the OWL Environment Manager and Contractor's Environmental Manager (where appropriate) throughout the construction and operational and maintenance phases. This will include a scheduled audit following the delivery of a toolbox talk, to ensure that the requirements and procedures have been understood. This may involve site visits and conversations with project personnel to monitor awareness. The OWL Environment Manager and Contractor's Environmental Manager (where appropriate) will develop specific checklists, informed by review of this EMP and Contractor RAMS, to facilitate the audit process.

The following environmental audits may be completed:

- OWL may carry out audits at any time, but at least once per quarter;
- During construction, the Contractor's Environmental Manager will undertake environmental audits on a monthly basis and will maintain a record of all completed audit forms, and records of corrective action and close outs;
- The Contractor's Environmental Manager will also undertake audits of sub-contractors, on a quarterly basis and provide an audit report to the OWL Environmental Manager within 2 weeks of the audit being undertaken; and
- The Contractor's Environmental Manager will also undertake environmental inspections on a weekly basis during construction and provide all relevant records to OWL when and as requested.

Details and findings of all monitoring and audit activities will be recorded. Any observations or corrective actions arising from audits and inspections will be addressed, with procedures updated in this EMP as required.

2.4.3 Review and change management

This EMP will be regularly reviewed over the lifetime of the Project. The Contractor's Environmental Manager will assume responsibility for the EMP during construction. Any refinement to the EMP, made by the Contractor, must be circulated to the OWL Environmental Manager for review and approval. The OWL Environment Manager will assume responsibility for the refinement of the EMP during the operational and maintenance phase of the Project. The EMP will be reviewed every six months or when any significant new information, methods, procedures or good practice becomes available. The EMP will also be updated in response to any findings or lessons learned during the construction and/or operational and maintenance phases.

A change management procedure will be followed by the Contractor's Environmental Manager in the event of a new environmental sensitivity being identified (e.g. which may be highlighted by ongoing monitoring surveys or in the event of a new environmentally designated area being proposed) during construction. Such a procedure is recommended in the IEMA Practitioner Guide (IEMA, 2008). Following notification of a change, the Contractor's Environmental Manager will initiate a process of assessment of potential impacts and, if necessary, update the EMP. The Contractor's Environmental Manager will maintain a record of

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changes and the review process. The updated EMP will be submitted to the competent authority for approval.

The OWL Environmental Manger will assume these responsibilities during the operational and maintenance phase of the Project.

3 PART II: ENVIRONMENTAL IMPACTS AND CONTROL MEASURES

3.1 Environmental impacts and control measures

This section of the EMP translates the commitments made in the EIAR into a format which can be developed into practical implementation by contractors and subcontractors. This is in accordance with the IEMA Practitioner Guide, which states that “the overall objective of an EMP is to provide a continuous link or ‘bridge’ between the design phase of a Project, conditions attached to consents, Project construction, and into the operational phase” (IEMA, 2008).

An outline Commitments Register is included in Annex 5 of the document. This includes designed in and management measures (controls) (i.e. the measures included in the Project), mitigation measures and monitoring commitments specified as specified in the EIAR relating to the offshore infrastructure (see volume 2B and volume 2C: chapter 25: Noise and vibration, chapter 27: Seascape and Landscape and Visual Impact Assessment; and chapter 30: Resource and Waste Management). This commitment register (version 01) will be updated in accordance with relevant consent conditions should consent be granted. The Commitments Register will form part of OWL and Contractor compliance checks throughout the project phases of the Project.

3.2 Management of key environmental aspects and compliance obligations

3.2.1 Marine species

A Mammal and Megafauna Mitigation Plan (see appendix 5-4) and Marine Mammal and Megafauna Protocol: Code of Conduct (see appendix 5-5) will be implemented.

In the unlikely event that a wildlife incident occurs, such as injury to a marine mammal, or an observed fish or bird mortality, the Contractor or responsible member of staff will notify the OWL Environmental Manager or ECoW as soon as practicable, with details of the activity taking place, photographs, and weather conditions present as a minimum. The OWL Environment Manager or OWL ECoW will follow up with the relevant regulatory authority, where appropriate.

Measures for minimising disturbance to rafting seabirds from construction vessels. Measures will include:

- Use of existing navigation approaches to port;
- Avoid over-revving engines to minimise noise; and
- Avoidance of rafting seabirds en-route between work areas and port, or within the offshore wind farm area and offshore cable corridor, achieved through briefing (e.g. toolbox talks) of vessel crew about the purpose and implications of the vessel management practices.

3.2.2 Marine archaeology

The procedures to be followed on discovering any marine archaeology during the construction and operational and maintenance phases of the Project are set out in EIAR appendix 5-10: Marine Archaeology Management Plan. This includes a Written Scheme of Investigation and a Protocol for Archaeological Discoveries similar to that set out by The Crown Estate in 2014 in the UK.

3.2.3 Other marine users

The approach to management and mitigation of potential impacts on other marine users are set out in the Commitments Register of in the following EIAR appendices;

- Lighting and Marking Plan (appendix 5-8); and

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- Fisheries Management and Mitigation Strategy (appendix 5-6).

Specifically measures covered by these plans include:

- The adoption of advisory safety zones;
- Appropriate notification of activities to other marine users;
- A clear process of marine coordination of all vessels and vessel activity;
- Appropriate marking and lighting of vessels;
- Appropriate marking and lighting of the Project; and
- Vessel transit planning, commercial fisheries relations and management of commercial fisheries interactions.

3.2.4 Marine pollution prevention and contingency planning

Measures will be adopted to ensure that the potential for release of pollutants from construction, operational and maintenance and decommissioning plant is minimised. These will include as a minimum:

- Designated areas for refuelling where spillages can be easily contained;
- Storage of chemicals in secure designated areas in line with appropriate regulations and guidelines;
- Double skinning of pipes and tanks containing hazardous substances; and
- Storage of these substances in impenetrable bunds.

In the event of a pollution incident, construction personnel should refer immediately to the Marine Pollution Contingency Plan included in Annex 2 of the EMP for details on appropriate response procedures.

3.2.5 Marine invasive non-native species

The procedure to be followed for the management of marine invasive non-native species during the construction and operational and maintenance phases of the Project is set out in the Marine Invasive Non-native Species Management Plan (see appendix 5-3 of the EIAR).

3.2.6 Resource and waste management

During construction, OWL require that all Contractors (and their Sub-Contractors) produce a Waste Management Plan (WMP), providing details of all waste management procedures for their activities and details of expected waste arisings (including marine litter) and proposed procedures for waste management. The Contractor's Environmental Manager will be responsible for the compilation of this document. The WMP(s) will include the following aspects as a minimum:

- Analysis of the waste arisings/material (including marine litter) surpluses;
- Specific waste/marine litter management objectives for the Project;
- Methods proposed for prevention, reuse and recycling of wastes and marine litter;
- Material handling procedures; and
- Proposals for education of workforce and plan dissemination programme.

The following Contractor requirements will be addressed in the WMP (s);

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- Meet all relevant legislative and EIAR requirements and obtain whatever additional permits and licences are necessary in relation to waste management and marine litter;
- Communicate the requirements of the WMP(s) to all personnel during their induction and ensure all operatives on site attend waste and marine litter reduction toolbox talks to increase awareness of recycling/waste reduction;
- Handle waste materials, marine litter and refuse so that it causes the least practicable damage and disturbance;
- Place all waste in suitably labelled secure containers;
- Check the contents of the site waste and recycling containers on a weekly basis. Non-compliance will be included in site environmental meetings and appropriate actions taken (e.g. a toolbox talk to all site operatives);
- Reduce waste and marine litter through waste elimination, reduction and recycling measures where feasible;
- Contain, recover and bring all relevant waste and/or marine litter back to shore and dispose of such waste in accordance with the legal waste management framework;
- Transfer of waste, marine litter or refuse will only be conducted by licensed waste carriers and waste treatment and waste disposal will be conducted by licensed and permitted waste management companies, in compliance with applicable waste legislation;
- Be compliant with and use the current version of Transfrontier Shipment of Waste Regulations where waste is being exported by Contractors (or their subcontractors). Export of waste will also be in line with the principles of the Basel Convention of 1989, which was agreed internationally to avoid hazardous waste being unfairly exported to developing countries; and
- All qualifying vessels must demonstrate compliance with MARPOL Annex V (and equivalent current Irish merchant shipping regulations) for waste management generally and MARPOL Annex IV (and equivalent current Irish merchant shipping regulations) for sewage waste specifically.

The Contractor's Environmental Manager will provide the WMP(s) to the OWL Environmental Manager for acceptance prior to the commencement of works.


The OWL Environmental Manager will be responsible for revising this document in preparation for the operational and maintenance phase of the Project.

4 PART III: ANNEXES

The following documents are included in Annexes 1-5 of this EMP:

- Annex 1: Environmental Policy;
- Annex 2: Marine Pollution Contingency Plan (MPCP);
- Annex 3: Environmental Incident Reporting Procedure;
- Annex 4: Dropped Objects Procedure Form; and
- Annex 5: Commitments Register.

ANNEX 1: ENVIRONMENTAL POLICY

	HSSE Policy			
	Document ID	PWD-HSSE-POL-0001		
	Scope	Department	Revision	Status
	Parkwind	HSSE	5.0	Final
			Date	26/01/2021

As a leading company in the development and generation of green and sustainable energy, Parkwind strives to be an industry leader in the management of Health, Safety, Security and Environmental risks, and the optimization of improvement opportunities throughout everything it does.

The Parkwind HSSE philosophy is based on the following principle:

“No one gets hurt, nothing gets damaged and all risks are controlled and managed”



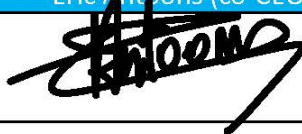
Health, Safety, Security and Environmental protection is a prime business objective, and it is the responsibility of top management and supervision to ensure the principles and the commitments stated within this Policy, are consistently achieved throughout.

To ensure common understanding, approach, and achievement of HSSE goals, Parkwind will actively encourage all partners, contractors, and subcontractors to adopt all HSSE Policy principles and commitments throughout their engagement.

To enable the HSSE principles to be achieved, Parkwind shall commit to ensuring:

- a HSSE Management System is established, implemented and maintained with the purpose of eliminating hazards and reducing HSSE risks;
- the provision of safe and healthy working conditions for the prevention of work-related injury and ill-health and to avoid security breaches, damage and/or pollution to the environment;
- HSSE objectives and targets are set, monitored, and reviewed to ensure compliance is being maintained;
- As a minimum, compliance with all applicable legal and other requirements and obligations;
- implementing known and approved industry standards and leading the way if such standards are not available;
- consult and ensure the active participation of all employees and contractor personnel on all HSSE related arrangements and issues and empower them to take action to stop the works if they feel the risks involved to be unacceptable;
- provide suitable and sufficient HSSE information, instruction and training to enable all personnel to carry out their job competently;
- continuous monitoring, review, and improvement of HSSE performance and the effectiveness of this HSSE Policy and HSSE Management System

The Executive Management of Parkwind underwrites this Policy, commits to provide adequate and appropriate resources and will ensure this Policy is properly communicated and understood by all.

	Fr�an�ois Van Leeuw (co-CEO)	Eric Antoons (co-CEO)
		

ANNEX 2: MARINE POLLUTION CONTINGENCY PLAN



ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Annex 2: Marine Pollution Contingency Plan (MPCP)

MDR1520B
EIAR – App. 5-2: Annex 2
A1 C01
March 2024

ORIEL WIND FARM PROJECT- MARINE POLLUTION CONTINGENCY PLAN

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Acronyms

Term	Meaning
COSHH	Control of Substances Hazardous to Health
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ERCoP	Emergency Response Cooperation Plan
HNS	Hazardous and Noxious Substances
IFO	Intermediate Fuel Oil
IRCG	Irish Coast Guard
ITOPF	International Tanker Owners Pollution Federation
MGO	Marine Gas Oil
MPCP	Marine Pollution Contingency Plan
NCP	National Contingency Plan
OSS	Offshore Substation
OWL	Oriel Windfarm Limited
POLREP	Initial Pollution Report
SOPEP	Ship-board Oil Pollution Contingency Plan
SDS	Safety Data Standard
WTG	Wind Turbine Generator

ORIEL WIND FARM PROJECT - MARINE POLLUTION CONTINGENCY PLAN

1 INTRODUCTION

1.1 Purpose

This Marine Pollution Contingency Plan (MPCP) provides the pollution response arrangements for the Oriel Wind Farm Project (hereafter referred to as the “Project”) during both the construction and operational and maintenance, and decommissioning phases of the offshore infrastructure. The overall objective of the MPCP is to outline procedures to safeguard the marine environment and respond to an accidental pollution event during the construction and operation of the Project.

1.2 Scope

This MPCP has been prepared to supplement the Environmental Management Plan (EMP) (appendix 5-2: Environmental Management Plan) and applies to relevant marine works undertaken on the Project.

The MPCP outlines procedures to protect project personnel and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to the Project.

The MPCP presents the following information and guidelines to aid a response in the event that there is an accidental release of pollutants into the marine environment resulting from works related to the Project:

- A risk assessment of the potential sources and likelihood of a pollution incident (section 4.2); and
- Oil spill response procedures and actions (see section 5.1).

It should be noted that the information and guidelines presented will be reviewed in consultation with the Irish Coast Guard (IRCG) and resubmitted for approval prior to commencement of the construction.

All Oriel Windfarm Limited (OWL) personnel and Contractors (including their Sub-Contractors) involved in the Project must comply with the OWL MPCP.

1.3 Document revision

OWL will refine the MPCP prior to commencement of construction and review this plan on a six-monthly basis thereafter.

The OWL MPCP will be further refined in preparation for the operational and maintenance phase of the Project.

The Department of Transport have prepared guidance on navigation risk and emergency response assessments and is currently in draft and undergoing consultation with the relevant stakeholders (as of February 2024). The Applicant will consider the final guidance once published and ensure that the MPCP complies with the guidance and in particular with regard Oil/HNS Spill Contingency Plans.

2 SUMMARY OF MEASURES, MITIGATION AND MONITORING INCLUDED IN THE EIAR

The measures included in the Project as identified in the EIAR relevant to the MPCP are summarised in Table 2-1.

Table 2-1: Measures included in the Project relevant to the MPCP.

Measures	Justification
<p>An Environmental Management Plan (EMP) will be implemented during the construction, operational and maintenance and decommissioning phases of the Project. The EMP will include mitigation/monitoring measures and commitments made within the EIAR and a MPCP which will include key emergency contact details (e.g. Environmental Protection Agency (EPA)). The EMP is included in appendix 5-2: Environmental Management Plan.</p>	<p>Measures will be included to ensure that the potential for release of pollutants from construction, operational and maintenance and decommissioning phases are minimised. These will likely include:</p> <ul style="list-style-type: none"> • Designated areas for refuelling where spillages can be easily contained; • Storage of chemicals in secure designated areas in line with appropriate regulations and guidelines; • Double skinning of pipes and tanks containing hazardous substances; and • Storage of these substances in impenetrable bunds. <p>In this manner, accidental release of contaminants from vessels will be strictly controlled, thus providing protection for marine life across all phases of the Project.</p> <p>Any accidental pollution of the marine environment will be immediately reported to the IRCG and to any other local authorities who are likely to be affected by such pollution.</p>

3 ROLES AND RESPONSIBILITIES

3.1 Oriel Windfarm Limited

OWL has overall operational and financial responsibility for any oil or chemical spill originating from the Project.

3.1.1 OWL Project Manager

The relevant OWL Project Manager (for each phase of the Project) is responsible for the overall implementation of the MPCP. Their main duties include:

- Developing and maintaining the OWL MPCP;
- Ensuring the development of relevant Contractor MPCPs, which will include adequate pollution prevention and spill response procedures, and the review and implementation of same;
- Managing ongoing Contractor spill response and ensuring Contractor compliance with the OWL MPCP;
- Liaising with statutory bodies in the event of a spill such as the IRCG and any local authorities who are likely to be affected; and
- Requiring that sufficient resources and processes are in place to deliver/comply with the OWL MPCP.

Following completion of construction, the OWL Project Manager will ensure the OWL MPCP is reviewed and amended as necessary for the operational and maintenance phase of the Project.

The OWL Project Manager may call upon the OWL Environmental Manager/OWL ECoW to support in the fulfilment of OWL duties relating to the OWL MPCP at any time.

OWL will review and update the OWL MPCP as necessary during the construction phase of the Project (e.g. to take into account any new information, as outlined in section 1.3). In the event of any oil or chemical spill to the marine environment, no matter how small, an internal meeting will be held following the close out of the incident to review lessons learned, with the OWL MPCP and Contractor MPCP updated as required.

OWL will ensure the appointment of a Marine Coordinator and a dedicated Spill Response Contractor for the Project.

3.1.2 Marine Coordinator

Prior to commencement of construction, a Marine Coordinator will be appointed to the Project Team. In addition to coordinating day-to-day vessel activity on the Project, the Marine Coordinator will be the main point of contact in the event of emergency and pollution incidents.

In the event of a pollution incident originating from a vessel or vessel related activity, the Marine Coordinator will assist with the coordination and execution of the ongoing response maintaining close communication with OWL (including the OWL Project Manager and OWL Environmental Manager/OWL ECoW) and relevant Contractors/subcontractors. Where a spill is from a project installation, the Marine Coordinator will oversee the spill response and any clean-up operations.

3.2 Contractor and subcontractors

Offshore construction and operation and maintenance work will be primarily conducted by Contractors. OWL require that all relevant Contractors/Subcontractors are familiar with the OWL MPCP.

OWL also require that relevant Contractors/Subcontractors identified by the OWL Project Manager prepare their own Contractor MPCP prior to commencement of any activities onsite. The Contractor MPCP will be submitted to OWL for review and approval and will be reviewed on a six-monthly basis thereafter. Any

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updates to the Contractor MPCP must be submitted to OWL for review and approval prior to implementation onsite.

The Contractor MPCP will be maintained in line with the OWL MPCP and revised accordingly.

The Contractor MPCP will comply with the OWL MPCP (which applies within the Project site boundary) and include their own spill response arrangements.

All Contractors/Subcontractors will be required to be familiar with the OWL MPCP and the Contractor MPCP and develop their own pollution prevention and contingency plans for approval by OWL; each must be compliant with the information as set out in the OWL MPCP.

All contractors will be responsible for ensuring relevant personnel are trained in pollution prevention and response and that appropriate pollution response equipment is available on-board vessels.

Relevant Contractors/Subcontractors will ensure that each vessel under their control has a Ship-board Oil Pollution Contingency Plan (SOPEP) (MARPOL 73/78 Annex I, reg. 26) or equivalent vessel-specific spill plan (for spills that originate from a vessel, or from operations taking place on a vessel related to the activity that they are contracted to carry out).

In the event of an incident onsite, the relevant Contractor/Subcontractor will ensure that the Marine Coordinator is made aware of all details associated with the incident and any proposed response procedures.

3.3 Spill response contractor

OWL require that Contractors engage an oil spill response contractor prior to construction commencing.

Oil spill response contractors should be capable of providing response capabilities commensurate with the potential worst-case scenario associated with the Contractor's scope of works.

During the operational and maintenance phase, an oil spill response contractor will be engaged for the offshore maintenance operations being undertaken.

4 POTENTIAL SPILL SOURCES AND CONTROL MEASURES

4.1 Potential spill sources

An inventory of the types of pollutants (and particularly hydrocarbons – oils and lubricants) that will be used during the construction and/or operation of the Project, together with relevant preventative measures will be set out in the relevant Contractors MPCP. This inventory of potential pollutants will inform the consideration of spill response strategies in the Contractor MPCP.

The Contractor MPCP will include detail on the volumes, types and sources of each of these pollutants (again with the focus on hydrocarbons) that are expected to be used based on the known requirements, as a basis for a more detailed risk assessment of potential pollution events and spill response strategies.

During construction and operation, the Marine Coordinator will develop and keep up to date a register of all vessels involved in offshore operations. This register will document the types and quantities of hydrocarbons carried on board (i.e. bunkers, lubrication oils and hydraulic oils).

Construction and operational works will be conducted in such a manner as to minimise the risk of spillage and pollution. Potential risks and control measures, based on the hydrocarbon and chemical inventories on the vessels and offshore installations, will be identified through the use of planning tools such as:

- Programme review meetings (involving all relevant contractors);
- Pre-job meetings to review the final work programme(s) in detail; and
- Hazard and risk identification to test the work programme for likelihood and severity of all identified risks and to identify appropriate control measures.

The risk assessment and management measures are set out in section 4.2 of the OWL MPCP and will include consideration of vessel refuelling at sea with due regard to industry standards and relevant legislation. Vessel refuelling will take place in port or under permit from the IRCG at sea.

4.2 Pollution sources and risk assessment

4.2.1 Tier classification

The strategy that will be adopted in the event of an oil spill will depend upon several factors:

- The size and characteristics of the spilled oil or pollutant;
- It's probable and predicted behaviour in the sea;
- Consideration of the environmental sensitivities in the path of the spill; and
- Consideration of the consequences of the different response options on the environment as a whole if they were to be adopted.

The severity of a spill depends on its size, the complexity of the response and the potential consequences for people, environment, assets, reputation, and for the economy.

By adopting a tiered approach and identifying the tier level, the appropriate resources can be mobilised to combat the pollution event.

For general oil spill response, it is common to divide levels of response into three tiers, according to the severity of the spill and the resources required to combat it. The three tiers are commonly defined as follows (Figure 4-1):

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- **Tier 1:** response is that which is immediately available on site, geared for the most frequently anticipated oil spill;
- **Tier 2:** spills are generally those beyond the capability of an authority or operator acting alone. The response is led by a harbour or local authority, depending on the extent of on-water and shoreline pollution, and may involve joint marine and coastal operations; and
- **Tier 3:** spills are generally more complex, of longer duration and higher impact, and beyond the response capability of the affected or threatened local authorities, harbour authority or facility operator. The response is nationally led and may involve a range of government departments. Coordination and oversight are by the IRCG, who may call on national resources and request international support. The National Contingency Plan (NCP) provides the framework for all Tiers but focuses on contingencies for Tier 3.

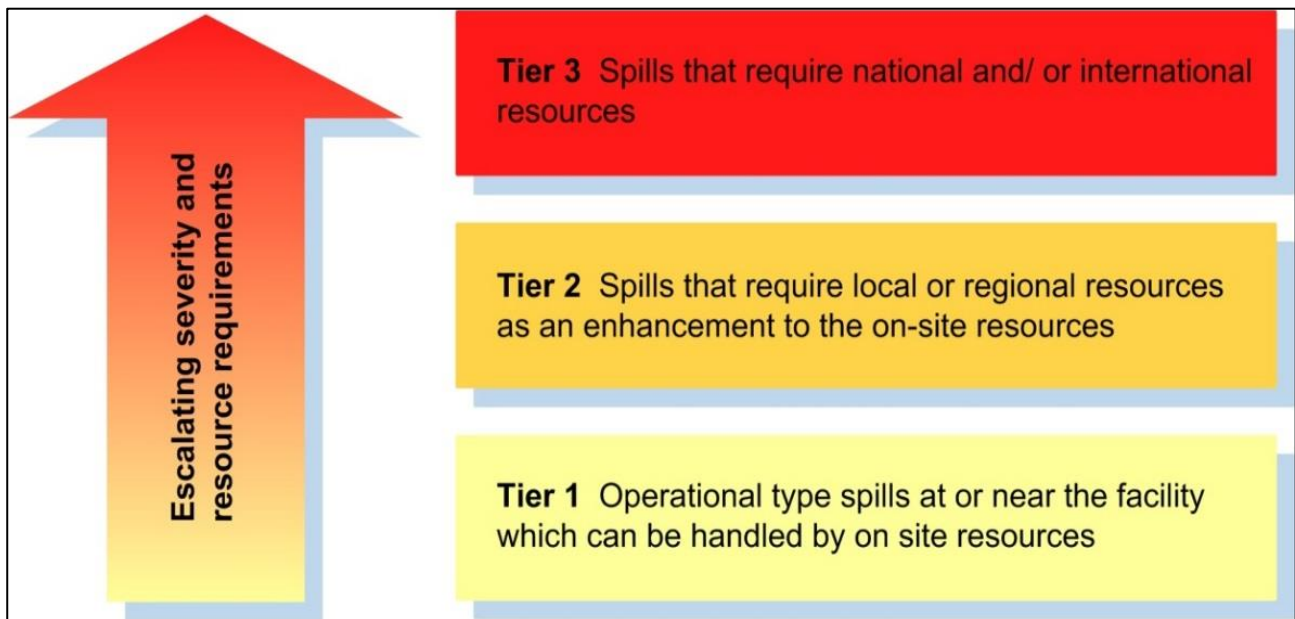


Figure 4-1: Tier definition.

The conventional view of a Tier 3 scenario is one involving an exceptionally large volume of spilled oil, for example, from a major ship-sourced accident, an oil well blowout, or other such rare but highly significant event. However, a Tier 3 response may also be required for more modest volumes, perhaps where Tier 2 arrangements may be largely absent or overwhelmed, highly sensitive areas threatened, or highly-specialised strategies being required that are not available locally.

The NCP does not define rigid criteria for initiating a national (Tier 3) response. It is the responsibility of the Ship Casualty and Pollution Manager (or authorised officer in their absence) to assess the situation and take the necessary action. However, as guidance, a Tier 3 incident may be initiated if:

- A shipping casualty gives rise to the risk of significant pollution requiring a salvage operation;
- A ship-source spill of oil or hazardous and noxious substance (HNS) at sea requires the deployment of sea borne or air-borne equipment to contain, disperse or neutralise it;
- An offshore unit spills oil or HNS at sea requiring the deployment of sea borne or airborne equipment to contain, disperse or neutralise it, which the operator of the unit does not have the capacity to deploy;

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- A spill of oil or HNS within the area of a harbour authority requires the deployment of national resources under national control to contain, disperse or neutralise it, or other action beyond the capacity of the harbour authority and local authority concerned; or
- A local authority requests the deployment of national shoreline equipment under national control because the action is beyond the capacity of the local authority after allowing for any mutual support arrangements with neighbouring authorities.

If it is not considered necessary to mount a national (Tier 3) response, the IRCG may in any case assist by deploying resources from the national stockpile to support the responder.

It is not possible to predict with certainty the Tier level outcome of any spill, and under a worst case spill scenario, it is possible (although considered highly unlikely) that a Tier 2 or Tier 3 response could be required.

The specific risk assessment for the Project is provided in Table 4-1 and shows that small operational type spills (e.g. Tier 1 category) are the most likely. However, the risk assessment cannot predict with certainty the Tier level outcome of any spill, and under a worst-case spill scenario, it is possible (although considered highly unlikely) that a Tier 2 or Tier 3 response could be required.

The main source of hydrocarbons associated with the Project will be Marine Gas Oil (MGO) or Intermediate Fuel Oil (IFO) used to fuel construction and operation/maintenance vessels. The quantities of MGO and IFO will be limited to the bunkering capabilities of the vessels. The potential worst-case spill scenario associated with the Project would be a complete loss of fuel inventory from two large vessels as a result of collision, or where a passing vessel collides with a wind farm vessel or structure. It must be noted that for larger vessels, even following a significant collision, it is unlikely that all fuel onboard would enter the water due to location of bunker tanks.

Once spilled in the marine environment, oil immediately begins to undergo weathering, a term used to describe many natural, physical, chemical and biological changes. The changes that the oil undergoes will often influence the effectiveness of response options. Prevailing meteorological and oceanographic conditions, as well as the type of oil spilled, will determine its ultimate fate.

4.2.2 Potential spill scenarios and control measures

Table 4-1 below sets out a risk assessment for potential spill scenarios and control measures to minimise or eliminate the risks for the Project (construction and operational and maintenance phase as appropriate). The table will be further refined prior to commencement of construction and adapted accordingly into the relevant Contractors MPCP. The risk assessment will also be reviewed and, if necessary, updated following completion of the construction phase, to ensure that it remains relevant for the operational and maintenance phase of the Project.

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Table 4-1: Potential spill scenarios and control measures for the Project.

Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
Hydrocarbons Intermediate Fuel Oil (IFO) Marine Gas Oil (MGO) (Diesel)	Vessel refuelling Loss of fuel during vessel to vessel refuelling at sea or refuelling at port.	Contractors will undertake operationally necessary refuelling at sea as required, to fuel vessels that are extremely restricted in their capability to leave station to take on fuel, such as jack ups. Preparation and review of task-specific risk assessments, method statements and fuel transfer planning tools and checklists. Refuelling of vessels or equipment offshore will, where practicable, only commence during daylight and in good weather conditions. Refuelling operations will be planned in advance.	Low	Tier 2
	Equipment refuelling Loss of fuel during refuelling of equipment (on vessel or on turbine/offshore substation site (OSS)).	Fuel transfer operations will be carefully conducted under the supervision by an appointed responsible person on board (e.g. Chief Engineer) and in accordance with each vessel's stipulated procedure and checklist. A bunker plan will be developed and posted on the Bridge and in the Machinery Control Room. Before fuel transfer starts a meeting will be held with all ship staff involved in the operation and the following subjects should be discussed, as a minimum: <ul style="list-style-type: none"> • Bunker plan, including any anticipating changes; • Risk assessment; • Individual roles and responsibilities in the process; • Emergency situations; and • Bunkering checklists. Only hoses fitted with non-return valves will be used for the offshore transfer of fuel or other fluids. Comply with all relevant legislation, permits and guidance relating to the environment they are working in and the activity they are engaged in. Appropriate training of personnel and supervision of activity. A visual lookout will be made at all times during fuel transfer operations to verify hose integrity throughout the transfer and in order to spot any leaks immediately. All storage tanks and/or areas will be banded to at least 110% of the total oil storage inventory volume. Personnel will be trained in spill prevention awareness, and in the use of spill kits. Spill kits will be readily available for mopping up any minor spills. Regular inspection and maintenance of equipment. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc. special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1

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Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	Vessel to vessel collision Loss of fuel from collision between two vessels.	All vessels will comply with project specific navigational requirements to prevent vessel to vessel collision and vessel to structure allision which will be set out in advance of construction and available prior to any Contractor activity onsite. Vessels and Marine Coordinators will also comply with all marine coordination measures to prevent collisions which will also be set out prior to commencement of activities onsite.	Very low	Tier 2
	Vessel to structure allision Loss of fuel from allision between vessel and structure (e.g. wind turbine).		Very low	Tier 2
	Vessel stranding/grounding Loss of fuel due to vessel stranding/grounding.	All vessels will comply with project specific navigational requirements to prevent vessel stranding/grounding which will be set out in advance of construction and available prior to any Contractor activity onsite.	Very low	Tier 2
	Failure of plant or equipment Release of fuel due to failure of plant or equipment.	All equipment will be operated and maintained in good order and in accordance with legal requirements. All plant and equipment will only be operated by adequately trained and competent personnel. All storage tanks and/or areas will be bunded to at least 110% of the total oil storage inventory volume. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc. special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
	Spillage during use of equipment Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel will be trained in spill prevention awareness, and in the use of spill kits. Spill kits will be readily available for mopping up any minor spills. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc. special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
Lubricating Oil	Incident Loss of lubricating oil from collision between two vessels, or allision between	All vessels will comply with project specific navigational requirements to prevent vessel to vessel collision, vessel to structure allision and vessel stranding/grounding which will be set out in advance of construction and available prior to any Contractor activity onsite. Vessels and Marine Coordinators will also comply all marine coordination measures to prevent collisions which will also be set out prior to commencement of activities onsite.	Very low	Tier 2

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Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	vessel and structure, or stranding/grounding of vessel.			
	Leakage within WTGs Leakage of lubricating gear oil or grease within nacelle.	All equipment will be operated and maintained in good order and in accordance with legal requirements. WTG nacelle frame typically will be designed and manufactured with a bund incorporated which can hold the full oil content of the gearbox in the event of a catastrophic failure. Turbine sensors will enable early detection of loss of fluid and leaks. There is a banded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Gear oil seals will be routinely checked during planned maintenance programmes.	Low	Tier 1
	Leakage within OSSs Leakage of transformers.	All equipment will be operated and maintained in good order and in accordance with legal requirements. Transformer oil seals will be routinely checked during planned maintenance programmes. Environmental mitigation measures, such as transformer bunding to contain any oil leaks, will be fully operational prior to the OSS transportation stage. The OSSs drainage system will collect waste water as well as connecting banded areas. The drainage system will incorporate an oil separation unit which separates any contamination from the collected water. The collected water is re-circulated through the oil separator with clean water being discharged in accordance to restricted limits and any contaminants securely contained and stored for transportation to shore and controlled processing and/or disposal.	Low	Tier 1
	Spillage during use of equipment Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel will be trained in spill prevention awareness, and in the use of spill kits. Spill kits will be readily available for mopping up any minor spills. Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
	Failure of plant or equipment Release of lubricating oil due to failure of plant or equipment.	All equipment will be operated and maintained in good order and in accordance with legal requirements. All plant and equipment will only be operated by adequately trained and competent personnel.	Low	Tier 1
Hydraulic Oil	Incident Loss of hydraulic oil from collision between two vessels, or collision between vessel and structure, or	All vessels will comply with project specific navigational requirements to prevent vessel to vessel collision, vessel to structure collision and vessel stranding/grounding which will be set out in advance of construction and available prior to any Contractor activity onsite. Vessels and Marine Coordinators will also comply all marine coordination measures to prevent collisions which will also be set out prior to commencement of activities onsite.	Very low	Tier 1

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Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	stranding/grounding of vessel.			
	Leakage within WTGs	All equipment will be operated and maintained in good order and in accordance with legal requirements. Turbine sensors will enable early detection of loss of fluid and leaks. There is a banded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Oil seals will be routinely checked during planned maintenance programmes.	Low	Tier 1
	Failure of plant or equipment Release of hydraulic oil due to failure of plant or equipment(e.g. hydraulic hoses).	All equipment will be operated and maintained in good order and in accordance with legal requirements. All plant and equipment will only be operated by adequately trained and competent personnel. All storage tanks and/or areas will be banded to at least 110% of the total oil storage inventory volume.	Low	Tier 1
	Spillage during use of equipment Small spills during operation.	Preparation and review of task-specific risk assessments and method statements. Personnel will be trained in spill prevention awareness, and in the use of spill kits. Spill kits will be readily available for mopping up any minor spills. Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
Chemicals	Incident Loss of chemical load from vessel collision/allision, or stranding/grounding of vessel.	All vessels will comply with project specific navigational requirements to prevent vessel to vessel collision, vessel to structure allision and vessel stranding/grounding which will be set out in advance of construction and available prior to any Contractor activity onsite. Chemicals will, where relevant, be selected, stored and managed in accordance with the relevant regulations and legislation.	Very low	Tier 1
	Leakage within WTG Leakage of coolant or transformer fluid within nacelle.	All equipment will be operated and maintained in good order and in accordance with legal requirements. Turbine sensors will enable early detection of loss of fluid and leaks. There is a banded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Equipment including hoses, pipes and seals will be routinely checked during planned maintenance programmes. Chemicals will, where relevant, be selected, stored and managed in accordance with the relevant regulations and legislation.	Low	Tier 1
	Spillage during use Spillage of paints, paint thinners,	Preparation and review of task-specific risk assessments and method statements. Personnel will be trained in the correct handling and use of chemicals. Personnel will be trained in spill prevention awareness, and in the use of spill kits.	Low	Tier 1

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Potential Pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely Tier
	solvents, cleaning fluids etc during use.	<p>Spill kits will be readily available for mopping up any minor spills.</p> <p>All hazardous substances will have a safety data sheet (SDS) which is intended to provide procedures for handling or working with that substance in a safe manner. The handling and use of chemicals and hazardous substances will be in compliance with the information on the SDS.</p> <p>Control of Substances Hazardous to Health (COSHH) assessments should be conducted for development specific hazardous substances.</p> <p>Segregated storage facilities will be used to control the separation of hazardous substances.</p> <p>Chemicals will, where relevant, be selected, stored and managed in accordance with relevant regulations and legislation.</p>		

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4.3 Estimated oil and chemical inventory

The type of oils and chemicals that may be used during the construction and operational and maintenance phases of the Project are listed in Table 4-2. The different types of oils have been allocated to one of four groups as defined by International Tanker Owners Pollution Federation (ITOPF) classification to indicate their level of persistence in the environment. Group 1 oils are considered to be least persistent (i.e. if spilled, they will dissipate and not form a surface emulsion) whilst Group 4 oils are very persistent (i.e. if spilled, they will not evaporate or disperse).

Information on the volume of these hydrocarbon types involved in the Project activity at any one time will be dependent on the specific vessels available to undertake the activities. Key Contractors will provide vessel data sheets for each of the main construction vessels to OWL. In the event of a pollution incident this information will be made available to the primary responder as required.

Table 4-2: Types of hydrocarbons and chemicals to be used.

Type of oil	ITOPF oil group	Comments
Intermediate Fuel Oil (IFO)	Group 3	Used by vessels involved in construction, operational and maintenance activities and for jack-up vessels.
Marine Gas Oil (MGO) / Diesel	Group 2	Used by vessels involved in construction and operational and maintenance activities.
Lubricating oil	Group 3	Used by vessels involved in construction and operational and maintenance activities.
Hydraulic oil	Group 2/3	Used within plant equipment
Chemicals	N/A	Various chemicals used routinely throughout construction and operational and maintenance activities

5 RESPONSE PROCEDURES AND CHECKLISTS

5.1 Pollution incident response procedure

5.1.1 Introduction

This section sets out the procedures to be adhered to in the event of a marine pollution incident.

The Project requires that any spill (actual or probable) into the marine environment, no matter how small, and no matter whether it arises from Project activities or not, is responded to, following the procedures set out below, whilst a Contractor is working on the Project.

Priority in the event of a spill is to take measures to ensure the safety of personnel and the offshore installations and vessels, and to prevent escalation of the incident.

Where a spillage is part of a wider emergency, such as fire or explosion, reference should also be made to the Emergency Response Co-operation Plan (ERCoP) (see volume 2A, appendix 5-7: ERCoP).

5.1.2 Spills originating from a vessel – response and notification overview

The processes set out below should be followed in the event of a marine pollution (hydrocarbon or chemical) incident where a spill originates from a vessel, from vessel related activity, or from a Contractor owned asset prior to transfer of ownership to the Project, during construction or operation or maintenance of offshore installations.

- When a spill is observed, it will be reported to the Contractor Vessel Master;
- The Contractor Vessel Master will report the spill as soon as it is safe to do so, to the IRCG via phone, and then to the Marine Coordinator (who in turn will notify OWL Project Manager) via phone. Verbal notification should be followed up when practicable with the submission by the vessel master of an Initial Pollution Report (POLREP) via email (or fax) to the IRCG, in accordance with Standard Operating Procedure 01-2020 (IRCG, 2020a), and the Marine Coordinator (who in turn will submit to the OWL Project Manager); and
- The Contractor responsible for the vessel from which the spill has originated will engage the vessel SOPEP or equivalent vessel-specific spill plan and assume primacy for the incident ensuring ongoing reporting on spill status, as necessary, and initiating response or clean-up operations as required. The relevant Contractor, as the primary responder, will request support from a specialist spill response contractor as required. The Marine Coordinator will provide a supporting role and assist with communication throughout an incident.

In the very unlikely event that a regional or national (Tier 2 or 3) response is required, the IRCG may take charge of the situation and implement the National Maritime Oil/Hazardous and Noxious Substances (HNS) Spill Contingency Plan (IRCG, 2020b).

[Hold: detailed procedures on actions to be taken by vessels contracted to the wind farm, OWL and contractors to be developed in agreement between the contractor and OWL.]

5.1.3 Spills originating from an installation associated with the Project – response and notification overview

When a spill is observed, it will be reported to the Marine Coordinator.

The Marine Coordinator will then report the spill to the IRCG via phone and the OWL Project Manager by phone. Verbal notification should be followed up when practicable with the submission of a POLREP via email (or fax) to the IRCG by the Marine Coordinator.

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The Marine Coordinator will engage the MPCP and assume primacy of the incident. The Marine Coordinator will be responsible for ongoing reporting on spill status and will coordinate an initial response with the spill observer who may utilise spill kits on the offshore installation. The primary responder will request support from a specialist spill response contractor as required.

As set out in Table 4-1, the type and volume of hydrocarbons and chemicals on the wind turbines and OSSs are not considered sufficient to warrant a Tier 2 or Tier 3 response. It is therefore not anticipated that the implementation of the National Maritime Oil/HNS Spill Contingency Plan (Irish Coast Guard, 2020b) or for the IRCG to take command of an incident from an offshore installation. However, the IRCG will be kept informed by verbal communications and through ongoing submission of the POLREP.

[Hold: detailed procedures on actions to be taken by vessels contracted to the wind farm, OWL and contractors to be developed in agreement between the contractor and OWL.]

5.1.4 Spills within port

For Port/Harbour Spills the Contractor will contact the relevant Port/Harbour Authority in the first instance and follow all port processes as advised. The Contractor MPCP will include details of all ports/harbour authorities of relevance. In advance of commencement of any works onsite, the Contractor will provide details of the main ports/harbour authorities anticipated to be used whilst working on the Project. All incidents that occur whether in the Project working area or not, must be notified to OWL Project Manager and Marine Coordinator.

5.2 Reporting requirements

It is required that all employees, contractors and subcontractors will report all accidents, incidents and hazards to the OWL Project Manager and Marine Coordinator.

Significant or potentially significant incidents (including marine incidents) are required to be immediately reported and escalated through the business management chain within 30 minutes of their occurrence or when safe to do so.

Various information will be requested by the IRCG when receiving reports of marine pollution. This will support the incident appraisal process and help determine potential response actions at the national level.

Those reporting should endeavour to have as much information as possible available but should not delay reporting if some information is absent or unknown. The initial pollution report (POLREP) form is provided in Annex 1 of the Emergency Response Cooperation Plan (ERCoP) (see appendix 5-7: ERCoP).

References

Irish Coast Guard (IRCG) (2020a) Assessment and notification of a pollution incident, Standard operating procedure 01-2020, Available at: <https://www.gov.ie/en/publication/79e5d-national-maritime-oilhns-spill-contingency-plan-nmoscp/> [Accessed 21/03/2021].

Irish Coast Guard (IRCG) (2020b) National Maritime Oil/HNS Spill Contingency Plan, 2020, Available at: <https://www.gov.ie/en/publication/79e5d-national-maritime-oilhns-spill-contingency-plan-nmoscp/> [Accessed 21/03/2021].

ANNEX 3: ENVIRONMENTAL INCIDENT REPORTING PROCEDURE

In the event that OWL personnel, contractors and/or subcontractors identify an environmental incident, they will notify the OWL Environmental Manager/OWL ECoW as soon as practical via telephone. The Contractor's Environmental Manager will obtain full details of the incident and subsequently prepare an incident report. They will assess if the incident results in a non-compliance event and inform the OWL Environmental Manager and OWL ECoW.

The OWL Environmental Manager will inform the competent authority of any relevant incidents of non-compliance with the EMP, providing the incident report when available, and liaising with the competent authority on actions to be taken.

OWL personnel, contractors and subcontractors will work together to review and update procedures to prevent similar incidents from reoccurring.

Depending on the nature of the incident, the following stakeholders may be informed:

- Environmental Protection Agency (EPA) and EPA 24-hour emergency incident line 0818 33 55 99;
- Inland Fisheries Ireland (IFI) and IFI 24-hour pollution line 0818 34 74 24;
- Emergency Services;
- Local Authority Environmental Officers;
- An Garda Síochána;
- National Parks and Wildlife Services; and
- The Irish Coast Guard.

The Contractor will complete a Safety and Environmental Awareness Report (SEAR) for all potential (near miss) or actual environmental incidents or emergencies which occur on site.

Significant or potentially significant incidents (including marine incidents) are required to be immediately reported and escalated through the business management chain within 30 minutes of their occurrence or when safe to do so.

ANNEX 4: PROPOSED DROPPED OBJECTS REPORTING FORM

Identity of Reporter	
Full Name:	Date of Report:
Company:	Position/Title:
Contact Telephone No:	Contact E-Mail:
Operator/Organisation/Company Responsible for Incident:	
Name of Installation or Vessel responsible for the loss or dumping of the material	
Location/position of the installation/vessel at the time of the loss or dumping:	
Latitude:	Longitude:
Date of Loss:	Time (24hours):
Weather conditions at time of loss/dumping:	Depth of Water (m):
Wind Direction (0-360 degree):	Wind Speed (knots):
Beaufort Scale:	Wave Height (metres):
Tide Rate:	Tide Direction:
Number of hours before/after High Water item was lost:	
4.1.1.1 Materials lost or dumped – provide as full a description as possible –i.e. clearly highlight if synthetic materials involved, are there wires involved, dimensions of materials etc. – If photo's available please attach separately. Specify the purpose of the function of the materials	
Dimensions of the object:	
Estimated clearance over object (including calculation methodology):	
If the materials are resting on the seabed are they lying wholly within a Safety Zone? Yes or No:	
Are the materials likely to float on sea surface or in water column? Yes or No	
If the answer to question above is YES - are materials likely to reach shore or cross a median line? - please specify	

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Reasons the loss or dumping (if Force Majeure is invoked please clearly state this):-

Are there plans to recover the materials? – if yes, specify details including anticipated timescales for the recovery operation. If there are no plans to recover the materials the reason for this must be clearly specified. Please detail if any further consent is required to undertake remediation action.

Please provide details of any interim mitigation measures put in place to deal with immediate risks to navigation:

Details of any radio Navigational Warnings and/or Notices to Mariners:

What are considered to be the risks and dangers to other users of the sea as a result of the lost or dumped materials not being recovered?

Any further information that may be useful:

ANNEX 5: COMMITMENTS REGISTER

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
1	Marine Process	Chapter 7	Scour protection	In the absence of scour protection, there is potential for scour pits to develop around foundations. This may result in the release of sediment into the water column and a change to seabed habitat in the vicinity of the foundation. Where required, scour protection will be installed as described in volume 2A, chapter 5: Project Description.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
2			Cables	The cables will be buried below the seabed wherever possible, to a minimum burial depth of 0.5 m and a maximum burial depth of up to 3 m. The appointed contractor will be required prior to the construction phase to submit details on the cable specification and installation methodology. This will include details on the cable laying, including geotechnical data, cable laying techniques and a cable burial risk assessment. Also, in advance of any cable repair, the contractor will be required to submit details on the parameters of the repair or reburial activities and the proposed methodology.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Cable specification and installation methodology	Applicant/ Contractor
3			Cables	The offshore cable will be installed through the intertidal zone using open cut trenching methods. The material will be excavated and reinstated on a layer-by-layer basis to minimise impacts on sediment structure and profile.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
4			EMP MPCP	An Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan) will be implemented during the construction, operation and maintenance and decommissioning phases of the Project. The EMP includes Project specific measures and commitments and a Marine Pollution Contingency Plan (MPCP (see volume 2A, appendix 5-2 (Annex 2)). Measures also include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds within the Project Infrastructure, i.e. WTG and offshore sub-station to ensure that the potential for release of pollutants from construction, operational and maintenance, and decommissioning is minimised. In this manner, accidental release of contaminants from vessels and Project infrastructure will be strictly controlled, thus providing protection for marine life across all phases of the Project development.	To be updated	Construction Operation & Maintenance Decommissioning	EMP, MPCP	Applicant/ Contractor
			ERCoP	This plan describes the actions to be taken in an emergency during both construction and operation, details the resources available to support those actions, and provides emergency contact details.	To be updated	Construction Operation & Maintenance Decommissioning	ERCoP	Applicant/ Contractor
5			MINNSMP	A Marine Invasive Non-Native Species Management Plan (volume 2A, appendix 5-3 Marine Invasive Non-Native Species Management Plan) will be implemented. The plan outline measures to ensure vessels comply with the International Maritime Organisation (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as measures to be adopted in the event that a high alert species is recorded.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	MINNSMP	Applicant/ Contractor
6	Benthic and Intertidal Ecology	Chapter 8	EMP MPCP	An Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan) will be implemented during the construction, operation and maintenance and decommissioning phases of the Project. The EMP includes Project specific measures and commitments and a Marine Pollution Contingency Plan (MPCP (see volume 2A, appendix 5-2 (Annex 2)). Measures also include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds.	To be updated	Construction Operation & Maintenance Decommissioning	EMP, MPCP	Applicant/ Contractor
7			Pre-Construction Survey	A pre-construction survey will be undertaken within the Project offshore wind farm area and offshore cable corridor to identify any areas of reef habitat (particularly Modiolus beds and S. spinulosa reef habitats). This will include a drop-down video survey to determine the extent, distribution and quality/condition of any reef. Should reef areas be identified during pre-construction surveys, appropriate measures will be agreed with regulatory and nature conservation bodies to avoid direct impact on these features. Where possible, features will be avoided by layout refinement of foundations and cables.	To be updated	Pre-Construction Construction		Applicant/ Contractor
8			MINNSMP	A Marine Invasive Non-Native Species Management Plan (volume 2A, appendix 5-3 Marine Invasive Non-Native Species Management Plan) will be implemented. The plan outline measures to ensure vessels comply with the International Maritime Organisation (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as measures to be adopted in the event that a high alert species is recorded.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	MINNSMP	Applicant/ Contractor
9			Re-Instatement of Rock	Reinstatement of rock in the intertidal zone following cable installation. Any cut rock will be placed back on top of the cable to backfill the trench.	To be updated	Construction		Applicant/ Contractor
10	Fish and Shellfish	Chapter 9	EMP	An Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan) will be implemented during the construction, operational and maintenance and decommissioning phases of the Project. The EMP includes project specific measures and commitments and a Marine Pollution Contingency Plan (MPCP). Measures also include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds.	To be updated	Construction Operation & Maintenance Decommissioning	EMP, MPCP	Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
11			Cables	<p>The cables will be buried below the seabed wherever possible, to a minimum burial depth of 0.5 m and a maximum burial depth of up to 3 m. The final selected installation method and target burial depth will be defined prior to construction based on a detailed cable burial risk assessment.</p> <p>The appointed contractor will be required prior to the construction phase to submit details on the cable specification and installation methodology. This will include a detailed cable laying plan, including geotechnical data, cable laying techniques and a cable burial risk assessment.</p> <p>In advance of any cable repair, the contractor will prepare details on the cable repair methodology repair or reburial activities setting out the parameters of the repair or reburial activities and the proposed methodology.</p>	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Cable specification and installation methodology	Applicant/ Contractor
12			Piling Operations	During piling operations, soft starts will be used (in accordance with international best practices for underwater noise, which includes the 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (NPWS, 2014)). This will involve the implementation of lower hammer energies (i.e. approximately 10-15% of the maximum hammer energy) at the beginning of the piling sequence before energy input is 'ramped up' (increased) over time to required higher levels.	To be updated	Construction	'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (NPWS, 2014)	Applicant/ Contractor
13	Marine Mammals and Megafauna (including Subsea Noise)	Chapter 10	EMP MPCP	<p>An Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan) will be implemented during the construction, operational and maintenance, and decommissioning phases of the Project. The EMP includes Project mitigation/monitoring measures and commitments and a Marine Pollution Contingency Plan (MPCP) which includes key emergency contact details (e.g. Environmental Protection Agency (EPA)).</p> <p>The EMP includes mitigation such as designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds. In this manner, accidental release of contaminants from vessels will be strictly controlled, thus providing protection for marine life across all phases of the Project.</p>	To be updated	Construction Operation & Maintenance Decommissioning	EMP, MPCP	Applicant/ Contractor
14			MMMP	<p>A Marine Megafauna Mitigation Plan (MMMP) (see volume 2A, appendix 5-4: Marine Megafauna Mitigation Plan) will be implemented prior to construction.</p> <p>The MMMP sets out the measures to apply in advance of and during piling activity, including the implementation of a mitigation zone, and monitoring by MMOs and Passive Acoustic Monitoring (PAM).</p>	To be updated	Pre-Construction Construction	MMMP	Applicant/ Contractor
15			Piling Operations	<p>During piling operations, soft starts will be used, following NPWS (2014) guidelines. This will involve the implementation of lower hammer energies (i.e. approximately 10-15% of the maximum hammer energy) at the beginning of the piling sequence before energy input is 'ramped up' (increased) over time to required higher levels (also known as a soft-start).</p> <p>The Applicant commits to implementing phased piling alongside other adjacent offshore wind farms in the western Irish Sea as part of a Piling Strategy. This strategy will be prepared post consent and will set out measures for collaboration with other projects to reduce the potential for an in-combination effect. This will include a stepped strategy which follows the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if phased piling is required a collaborative approach will be explored and information presented to demonstrate how a phased piling approach can contribute to the reduction in underwater sound from piling.</p>	To be updated	Construction	MMMP	Applicant/ Contractor
16			Geophysical Surveys	Geophysical surveys undertaken during the operational and maintenance phase will adopt similar measures as for piling operations, including the implementation of an approved MMMP and Vessel Code of Conduct (see volume 2A, appendix 5-4: Marine Megafauna Mitigation Plan and volume 2A, appendix 5-5: Marine Megafauna: Vessel Code of Conduct). Measures include the use of a mitigation zone around operations, within which MMOs and PAM will ensure that no marine megafauna are present in the vicinity of the geophysical survey vessel, and the use of a soft-start to survey operation, where possible.	To be updated	Operation & Maintenance	MMMP, Marine Megafauna: Vessel Code of Conduct	Applicant/ Contractor
17			Marine Megafauna: Vessel Code of Conduct	<p>A Vessel Code of Conduct (see volume 2A, appendix 5-5: Marine Megafauna: Vessel Code of Conduct) will be issued to all Project vessel operators, requiring them to:</p> <ul style="list-style-type: none"> • Refrain from approaching animals in the water; • Keep vessel speed to a minimum, including near haul-outs; and • Avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride. <p>The Marine Megafauna: Vessel Code of Conduct will be adhered to at all times.</p>	To be updated	Pre-Construction Construction	Marine Megafauna: Vessel Code of Conduct	Applicant/ Contractor
18			Cables	<p>The cables will be buried below the seabed wherever possible, to a minimum burial depth of 0.5 m and a maximum burial depth of 3 m. The appointed contractor will be required prior to the construction phase to submit details on the cable specification and installation methodology. This will include details on the cable laying, including geotechnical data, cable laying techniques and a cable burial risk assessment.</p> <p>Also, in advance of any cable repair, the contractor will be required to submit details on the parameters of the repair or reburial activities and the proposed methodology.</p>	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Cable specification and installation methodology	Applicant/ Contractor
19			ADD	Mitigation will also be applied by use of an Acoustic Deterrent Device (ADD) to minimise impacts arising from injury to marine megafauna from underwater noise during pile-driving by deterring animals to move beyond the predicted injury zone.	To be updated	Construction		Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
20	Offshore Ornithology	Chapter 11	EMP	An Environmental Management Plan (EMP) will be implemented during the construction, operational and maintenance, and decommissioning phases of the Project (see volume 2A, appendix 5-2: Environmental Management Plan). The EMP includes a plan for minimising disturbance to rafting seabirds from construction vessels. Measures include: <ul style="list-style-type: none"> • Use of existing navigation approaches to port; avoid over-revving engines to minimise noise; and • Avoidance of rafting seabirds and seaducks en-route between work areas and port, or within the offshore wind farm area and offshore cable corridor, achieved through briefing (e.g. toolbox talks) of vessel crew about the purpose and implications of the vessel management practices. 	To be updated	Construction Operation & Maintenance Decommissioning	EMP	Applicant/ Contractor
21			EMP MPCP	The EMP includes a Marine Pollution Contingency Plan (MPCP) which will include key emergency contact details (e.g. Environmental Protection Agency (EPA)). Measures for the MPCP include: <ul style="list-style-type: none"> • Designated areas for refuelling where spillages can be easily contained; • Storage of chemicals in secure designated areas in line with appropriate regulations and guidelines; and • Double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds. 	To be updated	Construction Operation & Maintenance Decommissioning	EMP, MPCP	Applicant/ Contractor
22	Commercial Fisheries	Chapter 12	Notification of Construction, Maintenance and Decommissioning Activities	Notification of construction, maintenance and decommissioning activities, including the nature, timing and location of activities, with details of any associated safety zones and advisory clearance distances, via Notices to Mariners.	To be updated	Construction Operation & Maintenance Decommissioning	FMMS	Applicant/ Contractor
23			Liaison with Fishing Fleets	Ongoing liaison with all fishing fleets (including regular Notice to Mariners).	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	FMMS	Applicant/ Contractor
24			Marine Coordination	Appropriate marine coordination to ensure risks associated with construction, maintenance and decommissioning vessels are minimised.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
25			Guard Vessels	Use of guard vessels, where appropriate.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
26			Aid to Navigation LMP	Implementation of Aids to Navigation (marking and lighting) (including temporary Aids to Navigation on any partially constructed turbines) see volume 2A, appendix 5-9: Lighting and Marking Plan (LMP).	To be updated	Construction Operation & Maintenance	LMP	Applicant/ Contractor
27			Marine Safety Zone	The Applicant will seek to maintain Marine Safety Zones of 500 m in radius around individual structures undergoing installation or decommissioning. Advisory Marine Safety Zones of 500 m will be implemented for incomplete structures at which construction activity may be temporarily paused. During the operational and maintenance phase, the Applicant will also seek to maintain Marine Safety Zones of 500 m in radius around infrastructure undergoing major maintenance (for example a blade replacement). The Applicant will implement an advisory clearance distance of 500 m in radius around cable installation vessels and cable repair vessels.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
28			FMMS	Volume 2A, appendix 5-7: Fisheries Management and Mitigation Strategy will be implemented in consultation with local fishing interests (and other interests as appropriate). The FMMS is prepared in accordance with available good practice guidance and with relevant policy set out in the NMPF (DHLGH, 2021). Current best practice guidance with regard to fisheries liaison management and mitigation in respect of offshore wind farm projects is represented by the Seafood/ORE Engagement in Ireland (DHLGH, 2023) and the UK Fishing Liaison with Offshore Wind and Wet Renewables (FLOWW) Group (FLOWW, 2014; 2015). The FMMS includes: <ul style="list-style-type: none"> • Details of roles and responsibilities, including Applicant responsibilities and details of the roles of the Fisheries Liaison Officer, and Fisheries Industry Representative; • Details of protocols for communication and information transfer; and • Measures to encourage co-existence and management measures, including those outlined above. 	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	FMMS	Applicant/ Contractor
29	Shipping and Navigation	Chapter 13	Notice to Mariners	Promulgation of information and warnings through Notice to Mariners and other appropriate Maritime Safety Information (MSI) dissemination methods. Throughout the life of the wind farm, regular liaison meetings to be held between project, sub-contractors and local marine stakeholders such as local harbour authorities, pilots, fishermen, and leisure groups such as yacht clubs. Information and warnings concerning any restrictions to navigation, including the imposition of any safety zones to be promulgated by Radio Navigation Warning Signals (NAVAREA 1 or HYDROLANT), Notice to Mariners, Notice to Airmen Publication.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	EMP	Applicant/ Contractor
30			Multi-Channel VHF	The Project to provide continuous watch by multi-channel VHF, including Digital Selective Calling (DSC).	To be updated	Construction Operation & Maintenance Decommissioning	EMP	Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent				Mechanism for Implementation				
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
31			Safety Zones	The applicant will seek to maintain advisory marine safety zones of 500 m radius to be implemented around WTGs and other offshore infrastructure undergoing construction/decommissioning or major maintenance activities. A rolling advisory clearance distance of 500 m in radius to be implemented around the cable laying vessel.	To be updated	Construction Operation & Maintenance Decommissioning	EMP	Applicant/ Contractor
32			Aid to Navigation LMP	Marker buoys and/or other AtoN will be deployed on a device-specific basis. AtoN Marking and Lighting Plan to be submitted to IRCG/CIL for approval and implementation prior to construction, as detailed in appendix 13-1: Navigation Risk Assessment. The plan will consider the necessary AtoN requirements (including specification, location and maintenance requirements) for the construction, operation and decommissioning phases of the Project. The AtoN management plan will be agreed prior to commencement of construction and should be developed in conjunction with IALA (2021) G1162 The Marking of Man-Made Offshore Structures.	To be updated	Construction Operation & Maintenance Decommissioning	LMP	Applicant/ Contractor
33			Vessel Traffic Monitoring	Project to undertake vessel traffic monitoring by: AIS, VHF, Closed Circuit Television (CCTV) with all Project-related vessels throughout all phases.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
34			Safety documents	The following safety documents will apply: Emergency Response Co-operation Plan (ERCoP): An ERCoP has been prepared and will be agreed with the IRCG and other key stakeholders as detailed in appendix 13-1: Navigation Risk Assessment prior to construction. The ERCoP (see volume 2A, appendix 5-8: Lighting and Marking Plan) details the emergency response planning requirements for the Project (at all stages) as directed by the IRCG and includes: <ul style="list-style-type: none"> Organisational information including roles and responsibilities for emergencies, equipment and facilities and liaison arrangements between the Applicant and IRCG; Search and Rescue information including role and responsibility of SAR coordinators, IRCG, communication requirements, SAR facilities (primary – e.g. SAR helicopters, secondary e.g. RNLI lifeboats), and medical advice / assistance; SAR Exercise requirements; Support Arrangements including shoreside reception arrangements, procedures on informing next of kin, etc. Additional Information including duties and functions of various participants in SAR operations; Project specific information (e.g. size, type and configuration of the infrastructure including support and maintenance vessels, details of proposed project activities for all phases, project SAR equipment and emergency response, etc.); and Emergency Action Card detailing emergency contact details, wind farm summary, WTG specific information, communications, monitoring, shutdown procedures, personal SAR location devices, mass evacuation details – etc. Navigation Safety Management System (NSMS): A NSMS will collate documents for management of navigational safety relevant to the marine activities from multiple sources. This includes documents created by the Project and those in place for third parties such as construction and maintenance contractors. As such the NSMS is not a singular plan but should include documentation related to: <ul style="list-style-type: none"> Navigational safety measures during construction phase; Navigational safety measures during operations and maintenance; Procedures for Project vessels when at the offshore wind farm area and in port; Details on promulgation of information; and Emergency Response procedures (links to ERCoP – see above). 	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	ERCoP, LMP	Applicant/ Contractor
35			Guard Vessels	Provision of a guard vessel to monitor third party vessel traffic and intervene with warnings, as necessary. Guard vessels will be used during the construction/decommissioning phases on a 24-hour basis (including the cable laying), and non-standard or major maintenance during the O&M phase, to patrol the offshore wind farm area and offshore cable corridor, monitor the effectiveness of control measures and advise any passing vessels of the works being conducted.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
36			Cable Burial Risk Assessment	A cable burial risk assessment will be conducted which will ensure cables are adequately buried so as not to become a navigation hazard, based on seabed characteristics and the density and distribution of vessel traffic. Where cable protection is used, this should not exceed a 5% reduction in under keel clearance (UKC). The cable burial risk assessment should be undertaken in line with the Carbon Trust Cable Burial and Risk Assessment Guidance (2015) for commercial shipping, fishing vessels and recreational craft based on: <ul style="list-style-type: none"> Baseline vessel traffic analysis: Geospatial temporal/spatial analysis, shipping intensity, vessel type, size and characterisation; Anchor / gear size / type by vessel usage and map present/future vessel anchorages/anchoring and fishing activity in proximity to the offshore cable corridor (including water depth, bed type ((geology, seabed features, bathymetry, sediments) and relevant MetOcean information); Probabilistic modelling of anchor drag/likelihood/extent for commercial vessels based on historical incident data, recovery time, penetration, drag speed and holding ground; Probabilistic modelling of fishing gear drag/likelihood/extent based on fishing gear type, incident data, recovery time, drag speed and holding ground; Qualitative recreational vessel cable burial risk assessment; and Based on results of the assessment identify the burial depth requirement for the Project cables. 	To be updated	Pre-construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
37			Subsea Cables	Subsea cables to be buried to Marine Survey Office agreed depth which provides sufficient protection without compromising UKC.	To be updated	Construction Operation & Maintenance Decommissioning	Cable specification and installation methodology	Applicant/ Contractor
38			IMO Convention compliance	Compliance with IMO Conventions including the International Regulations for Preventing Collisions at Sea (COLREGs) and SOLAS (IMO, 1974).	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
39			FMMS	Production of a Fisheries Management and Mitigation Strategy (FMMS) (volume 2A, appendix 5-7: Fisheries Management and Mitigation Strategy) in line with best practice guidance with regard to fisheries liaison management and mitigation and in consultation with local fishing interests (see chapter 12: Commercial Fisheries).	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	FMMS	Applicant/ Contractor
40			WTG Blade Air Draught Clearance	WTG blade air draught clearance of at least 22 m above High Water Mark (HWM).	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
41			Charting	Charting of offshore structures, inter-array cables and offshore cable and landfall infrastructure on navigation charts. Inform UKHO and the Kingfisher Information Services Cable Awareness (KISCA) accordingly.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
42			Line of Orientation	Agree lines of orientation with IRCG. WTG and OSS layout plan to be agreed with IRCG/CIL prior to construction.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
43	Aviation, Military and Communications	Chapter 14	Warning Lights	All significant peripheral structures, to the highest point of the structure, will be fitted with high intensity warning lighting. Specific requirements are listed in IAA ASAM No: 018 (IAA, 2015a).	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
44			LMP	Implementation of a Lighting and Marking Plan (LMP) (see appendix 5-10 in volume 2A of the EIAR) setting out specific requirements in terms of aviation lighting to be installed on the turbines. The LMP will be prepared in consultation with the IAA, DoD and IRCG.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	LMP	Applicant/ Contractor
45			Information on Locations, Heights and Lighting Status of the Wind Turbines	The IAA will be informed of the locations, heights and lighting status of the wind turbines, including estimated and actual dates of construction and the maximum heights of any construction equipment to be used, prior to the start of construction, to allow inclusion on Aviation Charts and in the IAA IAIP.	To be updated	Pre-Construction Construction		Applicant/ Contractor
46			Aeronautical Information Circulars	During the operational phase, the Project operator will issue, as necessary, requests to the IAA to submit Aeronautical Information Circulars (AIC) in the event of any failure of aviation lighting. Any light which fails shall be repaired or replaced as soon as is reasonably practicable. An alerting system for light failure will be put in place, such as remote monitoring or other suitable method agreeable to the IAA.	To be updated	Operation & Maintenance		Applicant/ Contractor
47			Aeronautical charts	All structures > 90 m amsl in height will be charted on aeronautical charts and reported to the IAA at least three months prior to construction, for input into the IAA's database of tall structures in Ireland.	To be updated	Pre-Construction		Applicant/ Contractor
48			Consultation of IAA and IRCG on Final Layouts	IAA and IRCG will be consulted on the final layout of the Project to ensure compatibility with SAR helicopter operations in the event of rescue missions within the wind farm.	To be updated	Pre-Construction		Applicant/ Contractor
49			Spacing of Blade Tip	A minimum spacing of 500 m will be maintained between blade tip to blade tip of all surface infrastructure (for OSS, this shall be taken as the outermost point of the infrastructure).	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
50			ERCoP	An Emergency Response and Cooperation Plan (ERCoP) will be in place for the operational and maintenance phase of the Project (see appendix 5-8 in volume 2A of the EIAR). The ERCoP details specific marking and lighting of the wind turbines and will consider helicopters undertaking SAR operations when rendering assistance to vessels and persons in the offshore wind farm area.	To be updated	Operation & Maintenance	ERCoP	Applicant/ Contractor
51			Promulgation of Information	Promulgation of information advising on the nature, timings and location of construction and decommissioning activities at the landfall location. Information and notices will be posted at the landfall location.	To be updated	Construction Decommissioning		Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
52			Consultation with Department of Defence	The Applicant will continue to consult with the DoD to better understand their aviation lighting requirements.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
53	Marine Archaeology	Chapter 15	Marine Archaeological Consultation	Marine archaeologists to be consulted in the preparation of any pre-construction ROV/diver surveys and, if appropriate, in monitoring/checking of data.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Marine Archaeology Management Plan	Applicant/ Contractor
54			Archaeological Exclusion Zone	The identification and implementation of Archaeological Exclusion Zones (AEZs) around sites identified as having a known important archaeological potential.	To be updated	Pre-Construction Construction	Marine Archaeology Management Plan	Applicant/ Contractor
55			Unconfirmed Archaeological Potential	All anomalies of unconfirmed archaeological potential to be taken into account during final design. If they are likely to be impacted, these anomalies would undergo further archaeological investigation. Should these anomalies prove to be of archaeological importance then future AEZs may be implemented following consultation with NMS.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Marine Archaeology Management Plan	Applicant/ Contractor
56			Protocol for Archaeological Discoveries	Provision of a Marine Archaeological Management Plan (see volume 2A, appendix 5-10: Marine Archaeological Management Plan) including an Outline Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) similar to that set out by The Crown Estate 2014 for guidance on the mitigation of marine archaeology receptors and unexpected archaeological discoveries made during the course of the development.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Marine Archaeology Management Plan	Applicant/ Contractor
57			Marine Archaeological Consultation	Marine archaeologists to be consulted in advance of pre-construction site preparation activities (as included in the project description) and, if appropriate, to carry out watching briefs of such work.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Marine Archaeology Management Plan	Applicant/ Contractor
58			Mitigation of Unavoidable Direct Impacts	Mitigation of unavoidable direct impacts on known sites of archaeological importance. Options include i) preservation by record, ii) stabilisation.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning	Marine Archaeology Management Plan	Applicant/ Contractor
59	Infrastructure and Other Users	Chapter 16	Marine Safety Zone	The Applicant will implement advisory Marine Safety Zones of 500 m in radius around individual structures undergoing installation or decommissioning. Advisory Marine Safety Zones of 50 m will be implemented for incomplete structures at which construction activity may be temporarily paused. During the operational and maintenance phase, the Applicant will also apply for advisory Marine Safety Zones of approximately 500 m in radius around infrastructure undergoing major maintenance (for example a blade replacement).	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
60			Clearance distance	The Applicant will implement an advisory clearance distance of 500 m in radius around cable installation vessels and cable repair vessels.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
61			Notice to Mariners	Notice to Mariners will be issued through the Marine Survey Office in advance of construction and maintenance activities to inform all marine users of the location, time period and safety and navigational requirements for the planned activity.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
62			Promulgation of Information	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners. Information and notices will also be posted at the landfall location. The Applicant will directly issue Notices to Mariners.	To be updated	Pre-Construction Construction Operation & Maintenance Decommissioning		Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
63			Navigational Aids and Marine Charting	Provision of suitable Navigational aids and marine charting, to be agreed with the Commissioner of Irish Lights (CIL). To include charting of all structures associated with the Project on relevant nautical and electronic charts and implementation of a buoyed construction/decommissioning area for the offshore wind farm area during each phase.	To be updated	Construction Operation & Maintenance Decommissioning	LMP	Applicant/ Contractor
			LMP	Lighting and marking to be agreed with CIL via a Lighting and Marking Plan (see volume 2A, appendix 5-9: Lighting and Marking Plan). Requirements align with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O-139 (IALA, 2013).				
64			Guard Vessels	The Applicant will use guard vessels during installation and major maintenance activities such as during cable repair activities or during use of jack up vessels.	To be updated	Construction Operation & Maintenance		Applicant/ Contractor
70	Resource and waste management	Chapter 30	EMP	Implementation of the Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan).	To be updated	Construction Operation & Maintenance Decommissioning	EMP	Applicant/ Contractor
73			Management of Waste: Vessels	All vessels will be required to manage waste in accordance with the accepted EU and international standards. These include the Sea Pollution Act, 1991, 1999, 2005 and 2006, the Dumping at Sea Act 1996, the International Convention on the Prevention of Pollution from Ships (MARPOL Convention), the European Communities (Port Reception Facilities for Ship-Generated Waste and Cargo Residues) Regulations 2003 (S.I. No. 117 of 2003), the Sea Pollution (Prevention of Pollution by Garbage from Ships) Regulations 2012 (S.I. No. 372/2012) and Sea Pollution (Prevention of Pollution by Sewage from Ships) (Amendment) Regulations 2012 (S.I. No. 492/2012). Each Port will also have a Port WMP which must be abided by and if waste is taken ashore, the Waste Management Act 1996 (as amended) will apply.	To be updated	Construction Operation & Maintenance Decommissioning		Applicant/ Contractor
74	Seascape, landscape and visual asses	Chapter 27	Turbine Towers and Blades	Turbine towers and blades will be to a uniform colouration. Turbine locations are spaced to reduce visual clutter and avoid overlap with background landscape. Turbines will be of identical rotor diameter.	To be updated	Construction Operation & Maintenance		
75	Bats in the Marine Environment	Chapter 31	Injury and/or Fatality Curtailment - During the First Year of Operation	A set of curtailment criteria will be established based on a combination of conditions (i.e. ideal conditions for bats) to stop or slow down the turbines during peak bat migration periods. These measures will minimise bat barotrauma and collisions. The curtailment will apply when all of the following parameters are met: <ul style="list-style-type: none"> • Peak bat migration periods; mid-March (e.g. 15 March) to end of May (i.e. 31 May); and mid-August (e.g. 15 August) to October (i.e. 31 October); • Between sunset and sunrise; • Sunset temperatures above 10 °C (Collins, 2023); • Wind speeds of < 5.4 m/s (20 km/hr) (Collins, 2023); • Where rainfall is < 4 mm/hr (i.e. low to moderate rainfall levels) occurring for a duration of longer than 30 minutes; and • When one bat call is acoustically detected within the previous thirty minutes. Bat detectors will be evenly placed across fifteen wind turbines within the offshore wind farm area (one at the lowest blade tip height; and one at the nacelle). <p>It is also considered important, whilst still ensuring bat protection during migration periods, that the curtailment criteria do not cause any unnecessary energy losses. To ensure this, bat echolocation detection measures will be put in place which will limit the curtailment criteria to only those times when bats are detected. Such detection measures may include the application of a Detection and Active Response Curtailment (DARC) system, which aims to reduce wind energy's impact on bats while increasing energy production. The bat echolocation detection system will be agreed with the NPWS.</p> <p>Static detector surveys will be undertaken at the lowest blade tip height above LAT of 27 m and at the nacelle/hub height of 145 to 152 m. Thirty bat detectors will be deployed evenly across fifteen turbines within the offshore wind farm area.</p> <p>The results of the mitigation during the first year of operation will be compiled into a report and submitted to the NPWS for review.</p>	To be updated	Operation & Maintenance		Applicant/ Contractor
76			Injury and/or Fatality Curtailment - During the Second Year of Operation	Upon agreement with the NPWS, an adjustment to the curtailment criteria may be made based on the results of bat migration records during the first year of operation, and static detectors will be re-deployed. The results of the mitigation during the second year of operation will be compiled into a report and submitted to the NPWS for review.	To be updated	Operation & Maintenance		Applicant/ Contractor
77			Injury and/or Fatality Curtailment - During the Third Year of Operation	Upon agreement with the NPWS, static detector survey results from year one and year two will be used as an average to update the curtailment criteria. Acoustic surveys will continue for the third year of operation.	To be updated	Operation & Maintenance		Applicant/ Contractor

Environmental Management, Mitigation and Monitoring Measures - to be completed post consent					Mechanism for Implementation			
No.	Topic	EIAR Chapter/ Other	Aspect	Commitment	Related Planning Condition	Project Phase	Relevant document for Implementation	Responsible Party
78			Injury and/or Fatality Curtailment - Operational Years Thereafter	Acoustic surveys will continue for the remaining duration of the operational lifetime of the Project. The curtailment criteria shall be reviewed and updated, as required.	To be updated	Operation & Maintenance		Applicant/ Contractor
79	Fish and Shellfish	Chapter 9	Voluntary Monitoring and Mitigation	Herring spawning grounds have been identified as a feature of a potential MPA and have been raised by An Bord Pleanála as a cause for concern. Therefore, due to the overlap with the Fish and Shellfish Ecology Study Area, the Project will consider voluntary monitoring and mitigation/enhancement opportunities. These include: <ul style="list-style-type: none"> • Baseline, construction and post-construction monitoring of egg/larval activity. Surveys may include either trawl surveys for adult herring (to see if they are spawning) or egg/larvae surveys to detect recent spawning activity. • Potential biodiversity net gain initiatives which could aid herring spawning population, such as oyster beds (shells are used for laying eggs on) within detailed design of cable protection and scour protection. 	To be updated	Pre-Construction Construction		OWL/Contractor
80	Offshore Ornithology	Chapter 11	Monitoring	The Project proposes to continue monitoring the population distribution and abundance of the Offshore Ornithology Study Area. This monitoring is proposed to consist of DAS before construction (Year 0) and Years 1, 3, 5 and 15 following construction, following the same scope, methods and analysis of the baseline surveys. This monitoring will allow the conclusions presented within this EIAR to be confirmed. No additional monitoring of a specific receptor is proposed at this stage. The Applicant is willing to discuss any additional monitoring requirements with the regulator.	To be updated	Pre-Construction Construction Operation & Maintenance		OWL/Contractor
81	Commercial Fisheries	Chapter 12	Monitoring	It is recognised that static gear fisheries can be particularly affected by offshore wind development, due to their strong fidelity to specific sites (Roach et al., 2022). Therefore, on a precautionary basis, a study will be undertaken in collaboration with local fishers to monitor the static (pot) fisheries before and after construction of the Project.	To be updated	Pre-Construction Construction		OWL/Contractor
82	Population and Human Health	Chapter 18	Monitoring	The following monitoring is suggested: <ul style="list-style-type: none"> • Monitoring of the proportion of local people with long-term unemployment, high job instability or low income who enter good quality stable employment with the Project in order to confirm the expected benefit and further tailor the targeting of local vulnerable groups. • Monitoring of the proportion of NEETs taking up, and completing, training opportunities with the Project in order to confirm the expected benefit and further tailor the targeting of local vulnerable groups. 	To be updated	Construction Operation & Maintenance Decommissioning		OWL/Contractor
83	Noise and Vibration	Chapter 25	Monitoring	Prior to the commencement of construction, the contractor will set out and agree a schedule of noise monitoring with the planning authority to include the number and locations at which noise monitoring will be carried out, the frequency and duration of the monitoring and the reporting of results.	To be updated	Construction		OWL/Contractor
84	Bats in the Marine Environment	Chapter 31	Monitoring	A competent and experienced Ecologist will be appointed by the Applicant and will ensure the following monitoring scheme is implemented in full: <ul style="list-style-type: none"> • At pre-construction stage, bat data will be collected using appropriate vessels to provide information on the usage of the offshore wind farm area by migrating bats during at least one spring migration period and at least one autumn migration period. Two bat detectors will be required per vessel and data will be collected weekly during the peak bat migration periods; • During the operational and maintenance phase, thirty static bat detectors will be deployed evenly across fifteen wind turbines within the offshore wind farm area (one at the lowest blade tip height; and one at the nacelle). These static bat detectors will be required to monitor bats during peak migration periods and monitor the success of mitigation measures; • Bat monitoring will be carried out annually, until Project decommissioning; and • The monitoring scheme and success of mitigation measures will be documented annually into a detailed report and submitted to the NPWS for discussion. 	To be updated	Pre-Construction Operation & Maintenance Decommissioning		OWL/Contractor

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ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Appendix 5-3: Marine Invasive Non-Indigenous Species Management Plan

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ORIEL WIND FARM PROJECT – MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

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ORIEL WIND FARM PROJECT – MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

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ORIEL WIND FARM PROJECT – MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

1 INTRODUCTION

1.1 Background

This Marine Invasive Non-Native Species Management Plan (MINNSMP) has been prepared by RPS on behalf of Oriel Windfarm Limited (the Applicant) to support the Environmental Impact Assessment Report (EIAR) for the Oriel Wind Farm Project (hereinafter referred to as ‘the Project’). This MINNSMP considers the installation, operation and maintenance, and decommissioning of the offshore infrastructure within the waters to the east of Dundalk Bay, County Louth (Figure 2-1).

This document will be further developed in advance of the construction phase of the Project and will incorporate relevant consent conditions.

The purpose of the MINNSMP is to set out the approach to invasive species management and mitigation in respect of the Project, providing an outline of the measures proposed to be implemented to facilitate biosecurity control and to minimise potential impacts on the local and wider environment.

Several invasive non-native species (INNS), including the slipper limpet *Crepidula fornicata*, soft shelled clam *Mya arenaria*, oyster thief *Colpomenia peregrina*, Darwin’s barnacle *Austrominius modestus*, and orange-tipped sea squirt *Diadumene lineata* have been recorded in low to very low abundances within a highly conservative 20 km buffer surrounding the offshore wind farm area, although the majority of records were only single individuals sighted in and around Carlingford Lough to the north of the Project (National Biodiversity Network (NBN) Gateway, 2022).

This plan has been drawn up to assess the risk of introduction and spread of INNS associated with the Project and to present appropriate measures to minimise these risks as much as possible following best guidance (Cook *et al.*, 2014, Payne *et al.*, 2015). It should be noted that guidance documents from the UK (e.g. GB INNS, 2008, Cook *et al.*, 2014, Payne *et al.*, 2015) have been referred to, alongside Invasive Species Ireland (ISI, 2021) which were developed for aquaculture applications, in the absence of similar best practice guidance in Ireland for this project type.

1.2 Scope

The remit of the MINNSMP is for the Project activities taking place below the High Water Mark (HWM).

1.3 Purpose

The purpose of this outline MINNSMP is to ensure all procedures pertaining to marine works (including construction, operation and maintenance and decommissioning of subsea structures) and vessel operations follow best practice guidance, preventing and reducing the risk of possible spread or introduction of INNS into the waters of the Project.

The method employed follows the principles of the GB INNS Framework Strategy (GB NNSS, 2008), although consideration has also been given to guidelines from Invasive Species Ireland (ISI, 2021), noting that these were developed for the aquaculture industry. The INNS Framework Strategy involves a three-tier approach:

- Prevention: Prevent all INNS from entering the waterbody in question;
- Rapid response: Detection of INNS as early as possible, monitor and possible eradication of INNS present; and
- Control and containment: Should proliferation of INNS be too great for eradication, control and containment of populations will be required.

This MINNSMP focuses on “Prevention”, in line with the INNS Framework Strategy, with a view to avoiding “rapid response” and “control and containment” methods where possible.

ORIEL WIND FARM PROJECT – MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

1.4 Document structure

The MINNSMP is structured as follows:

- Section 2: Project Description;
- Section 3: Marine Invasive Non-Native Species Management Plan Methodology; and
- Section 4: Oriel Wind Farm Project Marine Invasive Non-Native Species Management Plan.

2 PROJECT DESCRIPTION

2.1 Project characteristics

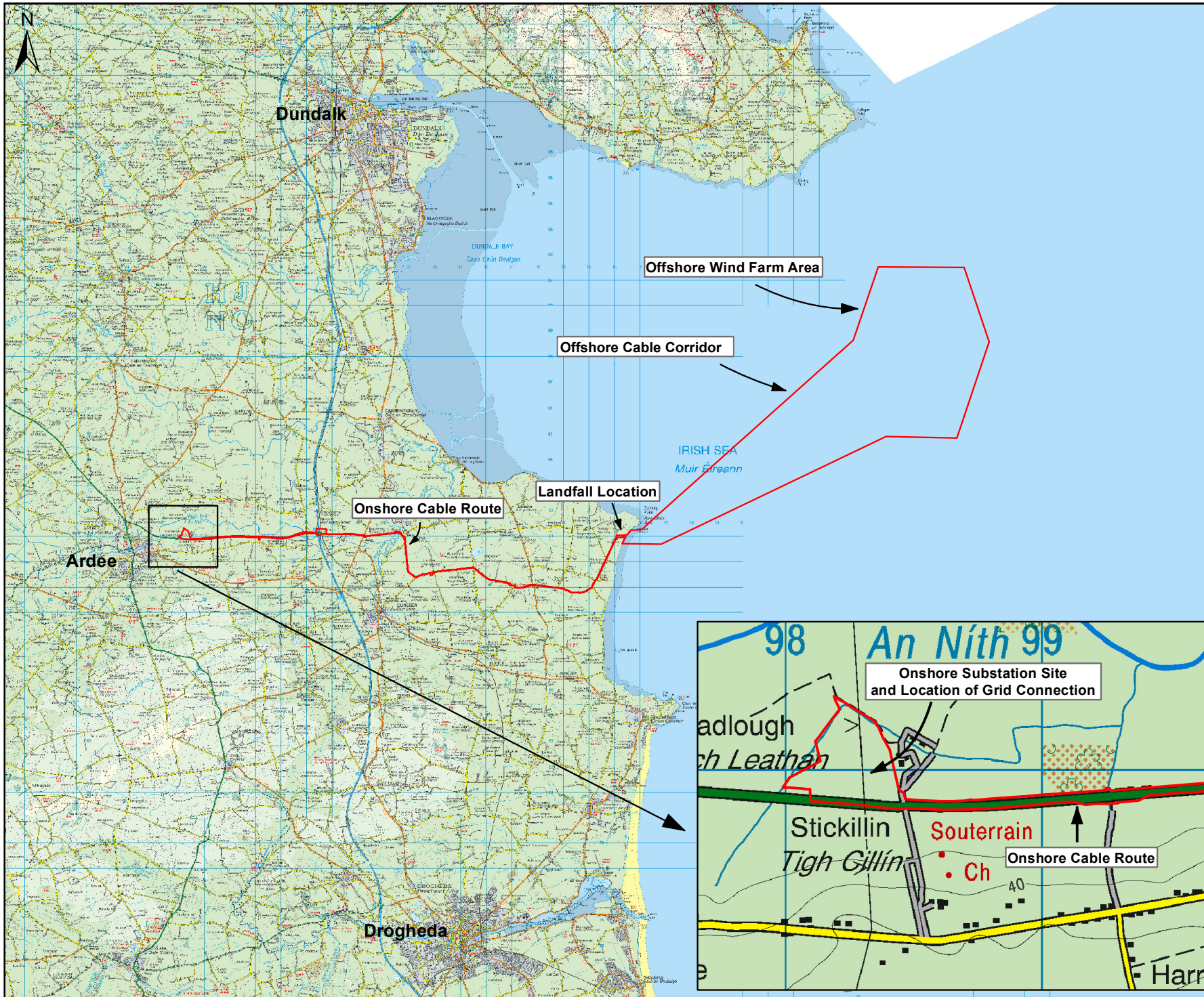
The offshore wind farm area is located in the Irish Sea, off the coast of County Louth (approximately 22 km east of Dundalk town centre and 18 km east of Blackrock). The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore cable corridor extends approximately 16 km southwest from the wind farm area to the landfall south of Dunany Point (Figure 2-1).

The Project will consist of the following key components:

- 25 wind turbine foundations (monopiles) attached to the seabed;
- 25 wind turbines (each comprising a tower section, nacelle and three rotor blades);
- One offshore substation (OSS) and associated foundations (monopiles) attached to the seabed;
- One OSS topside infrastructure (for the purposes of this report, the term OSS is used to refer collectively to the platform structure and the topside equipment);
- A network of 41 km of inter-array cabling;
- 16 km of offshore cable utilising the consented offshore cable corridor; and
- Scour protection and cable protection.

The offshore wind farm area (i.e. the area in which the turbines, inter-array cables and OSS will be located) covers 27.7 km². The offshore cable corridor extends approximately 11 km southwest from the offshore wind farm area to the landfall south of Dunany Point (Figure 2-1).

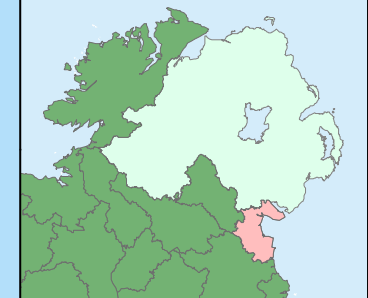
The turbines will be connected to each other by a network of inter-array cables, which will also connect into the OSS. The offshore cable will transfer the electricity from the OSS to shore, where it will connect to the onshore infrastructure.



Legend

- Planning Application Boundary

Data Sources: OWL, OSI.



Client



Project

Oriel Wind Farm Project

**Figure 2-1:
Overview of Oriel Wind Farm Project**

rps West Pier Business Campus,
Dun Laoghaire,
Co Dublin,
Ireland.

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Issue Details

Drawn By: NR	Project No. MDR1520b
Checked By: CC	File Ref:
Approved By: CC	MDR1520bArc3072F02
Scale: 1:200,000 @ A4	Projection:
Date: 12/01/2024	ITM (IRENET 95) Geographic Co-ordinates: ETRS89

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2.2 Policy

The EU Regulation on invasive alien species (No. 1143/2014) came into force in January 2015, which requires action plans to control the introduction and spread of INNS. This regulation indirectly affects the Water Framework Directive (WFD)¹ and the Marine Strategy Framework², ensuring compliance, follows best practice and aids in the protection of Irish waters. This regulation continues to be updated with invasive species of concern within the European Union regularly (No. 2022/1203).

In October 2017, Ireland's 3rd National Biodiversity Action Plan, for the period 2017-2021 was launched with seven objectives supported by 119 targeted actions. Target 4.4 relates to invasive non-native species and states *"Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species."*

There are seven supporting actions for this target:

- Ratify the International Convention for the Control and Management of Ships' Ballast Water and Sediments;
- Develop national and whole island plans to implement the EU Invasive Alien Species (IAS) Regulation and relevant sections of Ireland's EU (Birds and Natural Habitats) Regulations 2011 including: development and adoption of biosecurity plans in relevant state bodies; a Rapid Response Protocol for the island of Ireland; coordination and collation of invasive species surveillance and monitoring data; and work with Northern Ireland and UK authorities on invasive species of mutual concern;
- Continue and enhance measures for eradication, where feasible, control and containment of invasive species;
- Encourage horticultural nurseries to produce native species, varieties and landraces from appropriate native sources for public and private sector plantings. Public bodies will endeavour to plant native species in order to reduce importation of non-native species, varieties and landraces;
- Continue to produce Risk Assessments for potentially invasive non-native species;
- Publish legislation to address required provisions under the EU Regulation on invasive alien species (No. 1143/2014) and on responsibilities and powers regarding invasive alien species, giving IFI responsibility for aquatic invasive species; and
- Work with horticultural and pet trades
- National Biodiversity Action Plan 2023-2030 sets out Ireland's vision, objectives and outcomes for biodiversity in Ireland. Outcome 2H of this plan focuses on the control, management, and elimination of invasive species where possible within Ireland by 2030. Specific proposed measures include the potential creation of an INNS enforcement unit, along with the implementation of a range of EU and Ireland specific legislation to reduce INNS introduction and proliferation, with stakeholder engagement maintained at every stage. These proposed actions will be further considered upon full publication of this plan.

The European Union (Invasive Alien Species) (Freshwater Crayfish) Regulations 2018 (No. 354/18) came into force in Ireland in 2018 and were designed to protect native crayfish in existing freshwater habitats from the introduction of crayfish plague by means of fishing equipment or vessel ballast water from other areas.

1 The WFD requires all European member states to aim for good chemical and ecological status (ecological status takes into account INNS 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.

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Although this is largely a freshwater regulation, consideration should be given to the connectivity between marine and freshwater habitats in preventing the introduction of INNS by activities related to the Project.

In addition to this, The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019 came into force in December 2019. This MINNSMP ensures compliance with relevant legislation and international commitments for the Project.

This MINNSMP will be finalised prior to construction and will remain a 'live' document throughout the lifetime of the Project, with periodic updates by the Applicant during the construction, and operational and maintenance phases of the Project, as outlined within Section 3.7 (Evaluation and Review).

2.3 Consents

The Project will be subject to the consents shown in Table 2-1. This document will be updated to incorporate conditions of these consents.

Table 2-1: Consents applicable to the offshore infrastructure of the Project.

Consent	Legislation	Consenting authority	Date
Dumping at Sea Permit	Dumping at Sea Act 1996 (as amended)	Environmental Protection Agency (EPA)	To be applied for
Maritime Area Consent	Maritime Area Planning Act 2021	Department of the Environment, Climate, and Communications	2022
Planning application	Maritime Area Planning Act 2021	Department of the Environment, Climate, and Communications	TBC

[Hold: Other consents that may be required prior to construction to be outlined here].

2.4 Linkages with other consents management plans

The MINNSMP is consistent as far as possible with other relevant consents management plans prepared to inform the implementation of the Project. These are set out in Table 2-2 below with details of the linkages presented.

Table 2-2: Linkages with other consents management plans.

Consents Management Plan	Linkage with the MINNSMP
Environmental Management Plan (EMP)	The EMP provides the overarching framework for environmental management during the construction and operational phases of the Project. This can include proposed monitoring, methodologies and timings, along with a range of management plans including stakeholder engagement, traffic, waste, emergency response, and decommissioning and restoration.

3 MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN METHODOLOGY

This section outlines the process of creating a MINNSMP using the best available evidence available and following best practice guidance (Cook *et al.*, 2014, Payne *et al.*, 2015) and information provided in the Invasive Species Ireland website (ISI, 2021). To make an accurate risk assessment of the Project and derive a suitable MINNSMP, a stepwise approach was taken as discussed in detail below.

3.1 Step 1: Understanding your site

The first step in creating an MINNSMP is to provide a detailed description of the site. This information should include the salinity of the site, details of any man-made structures, and if INNS are present within the site.

Understanding the salinity of the site will determine if INNS are present. The majority of marine flora and fauna are unable to tolerate freshwater due to osmoregulatory effects leading to death (Evans, 1980). An increased volume of freshwater flowing into a site will likely result in less hospitable conditions, decreasing the risk of INNS on-site; conversely, a fully marine site tends to represent a greater risk of INNS introduction to communities of native species (Tang *et al.*, 2022).

The presence of artificial structures increases the risk of INNS establishment, even if the structure has only been present for just a few weeks as INNS are quick to establish populations (Bax *et al.*, 2003). Information related to any slow or stationary periods of works or climatic conditions that may increase biosecurity risk should be included.

If INNS have been found on-site, then the MINNSMP should focus on reducing the risk of introducing new INNS and consider how to prevent the spread of existing INNS to other sites. Throughout the whole process, the precautionary principle should be followed, even if no INNS are present on site.

Using this information, a site can be assessed as having a low or significant risk of introducing or spreading INNS. Table 3-1 provides an example of this.

Table 3-1: Example of low and significant risk sites (Payne *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); and • Anti-fouling used on artificial structures with periodic removal for air-drying. 	<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 • Site has connectivity to similar environments.

3.2 Step 2: Understand how INNS may be introduced or spread to your site

In addition to understanding the site, consideration of pathways by which INNS may be introduced or spread are needed. The step should be iterative and revisited when the MINNSMP is due for review. The questions and associated risk included in Table 3-2 have been adapted from Payne *et al.* (2015) and provide the type of questions to consider when creating an MINNSMP.

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Table 3-2: Example of questions and risks to consider whilst creating a MINNSMP (Payne *et al.*, 2015).

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

For example, a recreational vessel showing no signs of biofouling on the hull or below the waterline would be considered a low risk for introduction of INNS; conversely a work vessel/barge that moves from site to site and is present on site for long periods of time may have a medium – high, and therefore significant, risk of introducing INNS to site. For the purposes of this assessment, any activity that falls within the 'Low' category in Table 3-2 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 the risk of introducing INNS.

3.3 Step 3: Understand the site activities

Often this step involves a simple approach of listing all activities, using information obtained through the first two steps, which may carry a significant risk of introducing or spreading INNS. Once this list has been created, the next step is to develop relevant and proportionate control measures.

3.4 Step 4: Biosecurity control measures

It is important that measures to control the introduction or spread of INNS are effective, clear, realistic and easy to communicate to others. These measures must also consider how much control is enforceable over the site. A list of example control measures can be found within Cook *et al.* (2014), and Payne *et al.* (2015), many of which are included in the MINNSMP (see section 4.4). Where possible, biosecurity measures should be included in the in-design stage of a new development and aim to 'design out' any possible significant risk of introducing or spreading INNS.

3.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

This section will outline what procedures should be followed in the event of discovering and positively identifying an INNS on site. All staff and other site users should be encouraged to report any unusual sighting to the biosecurity officer.

3.6 Step 6: Contingency plan

In case of the failure of the 'prevention' and 'rapid response' methods to effectively manage INNS introduction (section 4.6), a contingency plan will be created. This document should be short, provide a step-by-step approach of action and be accessible to all staff. This plan will review the identified listed activities and determine areas of biosecurity control measures failure and recommend actions for effective management at this stage. For example, if a vessel had been wrongly assessed as low risk and introduced an INNS to the site, the introduced species would be sampled and identified, with the relevant authorities notified, followed by further containment and management measures being sought.

3.7 Evaluation and review

Following completion of the MINNSMP, a clear recording system and review cycle date will be put in place to refine and update the MINNSMP as required in line with relevant regulations and legislation.

4 MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

4.1 Step 1: Understanding your site

4.1.1 Environmental conditions affecting biosecurity

The Project is located outside of any currently designated environmental areas, but the offshore cable corridor traverses Dunany Point proposed Natural Heritage Area (pNHA) (approximately 870 m). This area is designated based on the presence of sandy sediments, mudflats, rocky outcrops, and shingle bank habitats and should be considered as a potential site of INNS introduction for species which can utilise these habitats during cable-laying and operational activities.

The Project is located on relatively flat seabed with depths varying from 16 m chart datum in the northwest to 32 m chart datum in the southeast. Tidal currents in the area are relatively weak, with 80% of tides over a 12-month period having a current flow speed of below 0.2 m/s, flooding to the northwest, and ebbing to the southeast, as determined through desktop study for volume 2B, chapter 7: Marine Processes.

The benthic subtidal ecology characterisation of the offshore wind farm area indicated that the Project is dominated by circalittoral coarse sediments in the north, with finer circalittoral sand in the south, and a patchy distribution of circalittoral rock and biogenic reef (although no biogenic reef was identified during site specific surveys). This area is known to support high abundance echinoderm, bivalve, and polychaete communities. The offshore cable corridor is characterised primarily by circalittoral mud and coarse sediment, with associated bivalve *Chamelea gallina* dominated communities. Further specific environmental baseline conditions are identified and assessed in volume 2B, chapter 8: Benthic Subtidal and Intertidal Ecology.

4.1.2 Information related to any slow or stationary periods or climatic condition that may increase biosecurity risk

Detailed information relating specifically to the physical environmental conditions in the vicinity of the Project can be found in volume 2B, chapter 7: Marine Processes and volume 2B, appendix 7-1: Marine Processes Technical Report.

The offshore wind farm area experiences weak tidal currents with a range of muddy, fine sand, and coarse sedimentary benthic environments. Slow tidal current conditions may act to increase potential biosecurity risks, as fouling organisms may have more opportunity to colonise and establish communities (Bax *et al.*, 2001). However, the presence of natural hard substrates and biogenic reef formations indicate that introduced substrates will be unlikely to represent a significant change from baseline conditions, and thus the probability of INNS establishment related directly to the introduced substrates will be reduced.

4.1.3 INNS in the offshore wind farm area

No INNS have been recorded within the offshore wind farm area. The Aquafact site specific surveys (2019) and NBN data (2022) indicated no INNS present within the offshore wind farm area at the sites sampled. Should any be recorded in the area prior to finalising the plan, these should be highlighted here, identifying the risk that each species represents to Ireland's native species.

4.2 Step 2: Understand how INNS may be introduced or spread to your site

4.2.1 Vessels and equipment to be used in the Project

Table 4-1 provides an example of the vessels and equipment to be used at the Project with a 'risk' indicator for the potential to introduce or spread INNS to the Project in the Irish Sea. This risk assessment will be updated once the final project design has been confirmed and will be based on professional judgement, the final project design, INNS present within the area (see Section 4.1), and available guidance.

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The EIAR is based on the project design (Table 4-1). These will be refined post consent, such that the risk can be accurately assessed. As stated previously, this is a 'live' document and as such, if specific details of the Project undergo review or are changed, this document will be updated accordingly.

Table 4-1: Vessel, foundation type, and substrates to be used in the Project and/or involved in the operation.

Name	Type	Details and Risk factors assumptions	Risk: Low/Significant
Vessels (construction phase)	Various	<ul style="list-style-type: none"> Vessel types and sizes to include 3 jack-up barges/dynamic positioning vessels, 2 commissioning vessels, 2 tug/anchor handlers, 2 cable installation vessels, 1 guard vessel, 4 survey vessels, 8 crew transfer vessels (CTVs), and 5 scour/cable protection installation vessels; Vessels for construction will be sourced from an Irish Sea port, with final decision still to be made; Vessels will be required to have an anti-fouling coating and inspection history complying with relevant regulations; Vessels are expected to move slowly when installing or removing structures; and Up to 465 vessel round trips are planned during this phase. 	Low
Turbine and OSS foundations	Monopile – 9.6 m diameter	<ul style="list-style-type: none"> 25 wind turbine foundations; 1 OSS foundation; Total area of foundations: 332,060 m²; Foundations to occupy all of the water column; and Foundations to be transported to site from an Irish Sea port (pending final decision) using installation jack-up or dynamic positioning vessels, or feeder barges. 	Low
Scour and cable protection	Rock armour or concrete mattresses	<ul style="list-style-type: none"> 1,810 m² of scour protection on each foundation, accounting for 47,060 m² overall; Scour protection comprising rock armour layer on filter layer of smaller graded rocks; Cable protection on 50% of 41 km of inter-array cables, and 50% of 16 km of offshore cable accounting for 205,000 m² of cable protection; and Cable protection comprising 2 m of rock armour (rock size means ranging from 90-250 mm, 1-3 kg respectively), or concrete mattresses, depending on site conditions. 	Low

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4.3 Step 3: Understand the site activities

A list of the Project activities that may have a significant risk of introducing or spreading INNS is provided in Table 4-2. These are derived from information provided in the current project description and will be updated based on the final project design as explained in Step 2 (section 4.2), with these activities predicted to represent a significant risk of INNS introduction during the construction, operation and maintenance and decommissioning phases.

Table 4-2: Site activities which have a significant risk of introducing or spreading INNS.

Phase	Activity Description
Installation	<ul style="list-style-type: none"> • Provision of temporary moorings; • Installation of man-made structures; and • Using vessels from outside of the offshore wind farm area.
Operation and maintenance	<ul style="list-style-type: none"> • Presence of man-made structures; and • Maintaining man-made structures and ancillary equipment.
Decommissioning	<ul style="list-style-type: none"> • Removal of man-made structures and ancillary equipment; and • Cleaning and disposal of biofouling from man-made structures and ancillary equipment.

4.4 Step 4: Biosecurity control measures

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

4.4.1 Installation/presence of man-made structures

Risk

This may pose one of the greatest risks of INNS introduction or spreading associated with the Project. New or clean surfaces in ports, marinas and waterways are typically the first colonisation sites for INNS due to their ability to settle and rapidly proliferate, replacing native populations (Huxel, 1999). Newly available hard surfaces (e.g. foundations or scour/cable protection) associated with the Project may be susceptible to colonisation by INNS in the first few weeks/months after installation (Bax *et al.*, 2003).

Control Measures

Any man-made structure to be used for the Project should be of terrestrial origin (i.e. not coming from another marine environment) 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 inspected prior to placement in the marine environment.

4.4.2 Using vessels from outside of the Project

Risk

Using vessels from outside the western Irish Sea area poses a significant risk of introducing INNS to the area (Minchin and Gollasch, 2010), especially vessels coming from areas of similar marine environment. Information on the origin of the vessels to be used in all phases of the Project will be included within the MINNSMP once the exact details and origins of vessels are specified following appointment of construction contractors, although it is currently expected they will operate from an Irish Sea port, and this will be finalised when confirmed.

Control Measures

All vessels to be used for construction, operation and maintenance and decommissioning activities must follow guidance as directed by the 'Guidelines for the Control and Management of Ships' biofouling to

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minimise the transfer of invasive aquatic species³, and where applicable, to comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments'⁴.

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

Risk

During routine operations and maintenance activities (e.g. jet washing of marine growth from the splash zone, or component replacement where required), there is potential for any established INNS to be detached from subsea structures. Where there is an identified risk that these activities may lead to spread of INNS in the marine environment (e.g. where INNS have a high potential for colonisation of the area of the foundation undergoing maintenance, or where INNS have been directly identified colonising turbines), additional control measures may be required.

Following removal of marine structures (e.g. foundations) during the decommissioning phase, INNS, if present, may still be attached to the surface. Should the INNS be removed without due care and washed back into the marine environment surrounding the Project, these INNS may represent a risk of spreading to areas previously unaffected.

Control Measures

Where there is an identified risk that operation and maintenance activities (e.g. periodic cleaning of foundations) may lead to spread of INNS (e.g. if there is a high risk that INNS are present on foundations), control measures may be required to minimise the amount of material entering the marine environment.

Large volumes of material detached or removed from decommissioned subsea infrastructure should be prevented from re-entering the marine environment. Material should be taken away and properly disposed of onshore. Control measures taken in relation to disposal of biofouling will be aligned with the relevant Port Authority 'Waste Management Plan'.

Biosecurity action

Prior to the installation of subsea structures or operation of new vessels to the offshore wind farm area, the Applicant and their contractors must include the following biosecurity clauses in any contract agreement:

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

4.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

Table 4-3 outlines who is responsible for carrying out certain checks of INNS, where these checks are to be carried out and when.

³ For more information, see: <http://www.imo.org/en/OurWork/Environment/Biofouling/Pages/default.aspx>

⁴ For more information, see: <http://www.imo.org/en/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx>

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Table 4-3: Roles, responsibilities, and instructions for staff, contractors, and site users.

Who	What	Where	When
Project Operations and Environment Manager - developers and contractors	<ul style="list-style-type: none"> Oversee removal of flora and fauna from Project offshore infrastructure, ensure material is properly disposed of and that no material is released into the water as per the relevant Port 'Waste Management Plan'; and Awareness of INNS, including identification guidance on the key risk species. If uncertainty arises, follow the contingency plan. 	At Port	Beginning of works
Project Operations and Environment Manager or appropriate contractor	<ul style="list-style-type: none"> Oversee installation and removal of Project offshore infrastructure, checking for INNS or unknown organisms; For operations and maintenance, periodic checks should be carried out after two months to ensure no growth/settlement of INNS; Be aware of any slow moving or inactive craft and take steps to assess risk; Ensure a Check, Clean and Dry message is sent to any new developers or contractors; and Where possible, collaborate with the relevant Port Authority and other users of the offshore wind farm area to raise INNS awareness. 	At Port	Beginning of works
Developers and contractors	<ul style="list-style-type: none"> Confirm origin of material used in constructing of marine energy devices and ancillary equipment (i.e. terrestrial origin, not previously submerged in marine water); and Encourage 'tool box' talks on INNS prevention and monitoring. 	N/A	Throughout works
Project Operations and Environment Manager - developers and contractors	<ul style="list-style-type: none"> Through collaboration with the Regulators (including the Department of the Environment Climate and Communications, Invasive Species Ireland, and Port Authority) will develop measures appropriate to the Project deployment specific to the site, nature, and duration of Project activities on a case by case basis. 	N/A	Beginning of works

4.6 Step 6: Contingency plan

Table 4-4: Contingency plan in event of failure of prevention of INNS introduction.

Action	Responsibility
Stage One – Suspected arrival of high alert species	
Take photographs of sample and collect sample in a plastic bag.	Designated biosecurity officer, site manager, Contractor Environmental Manager or Project Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery.
Check organism against identification sheet (see https://invasivespeciesireland.com/species-accounts/established/marine) Report to: https://invasivespeciesireland.com/report-sighting	Designated biosecurity officer, site manager, Contractor Environmental Manager or Project Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery.
Stage Two – Presence of high alert species confirmed	
Initiate immediate containment measures, including restricted vessel movements.	Designated biosecurity officer, site manager, Contractor Environmental Manager or Project Environmental Manager (depending on the phase of the project).

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Action	Responsibility
Carry out wider survey of vessels and structures.	Designated biosecurity officer, qualified ecologist.
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.	Designated biosecurity officer and Contractor Environmental Manager or Project Environmental Manager (depending on the phase of the project).

4.7 Evaluation and review

Location of biosecurity logbook

A biosecurity logbook will be kept (electronic form) for the Project and will be made available for inspection and review as and when required.

Plan review date

This plan will be updated prior to construction to include the final project design and to include an updated risk assessment based on that final design. This will include all measures to manage INNS during the construction, phase as agreed with the relevant regulatory authorities, (i.e. Invasive Species Ireland and NPWS).

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 and activities associated with it. The plan will be updated at regular intervals 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 INNS (e.g. records of INNS being present on site) are reflected in the MINNSMP, as agreed with the relevant regulatory authorities.

ORIEL WIND FARM PROJECT – MARINE INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

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ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Appendix 5-4: Marine Megafauna Mitigation Plan

MDR1520B
EIAR – Appendix 5-4
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March 2024

ORIEL WIND FARM PROJECT – MARINE MEGAFUNA MITIGATION PLAN

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Acronyms

Term	Meaning
ADD	Acoustic Deterrent Device
CBRA	Cable Burial Risk Assessment
CTV	Crew Transfer Vessels
ECoW	Environmental Clerk of Works
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Fields
EPA	Environmental Protection Agency
HWM	High Water Mark
IEF	Important Ecological Features
MEC	Maximum Export Capacity
MMMP	Marine Megafauna Mitigation Plan
MMO	Marine Mammal Observation
MPCP	Marine Protection Contingency Plan
NMPF	National Marine Planning Framework
NMFS	National Marine Fisheries Service (USA Federal agency within NOAA)
NPWS	National Parks and Wildlife Service
OSS	Offshore Substation
OWL	Oriel Windfarm Limited
PAM	Passive Acoustic Monitoring
PTS	Permanent Threshold Shift
SAC	Special Area of Conservation
SAM	Static Acoustic Monitoring
SEL	Sound Exposure Level
SPL	Sound Pressure Level
TSS	Temporary Threshold Shift
WTG	Wind Turbine Generator

1 MARINE MEGAFUNA MITIGATION PLAN

1.1 Introduction

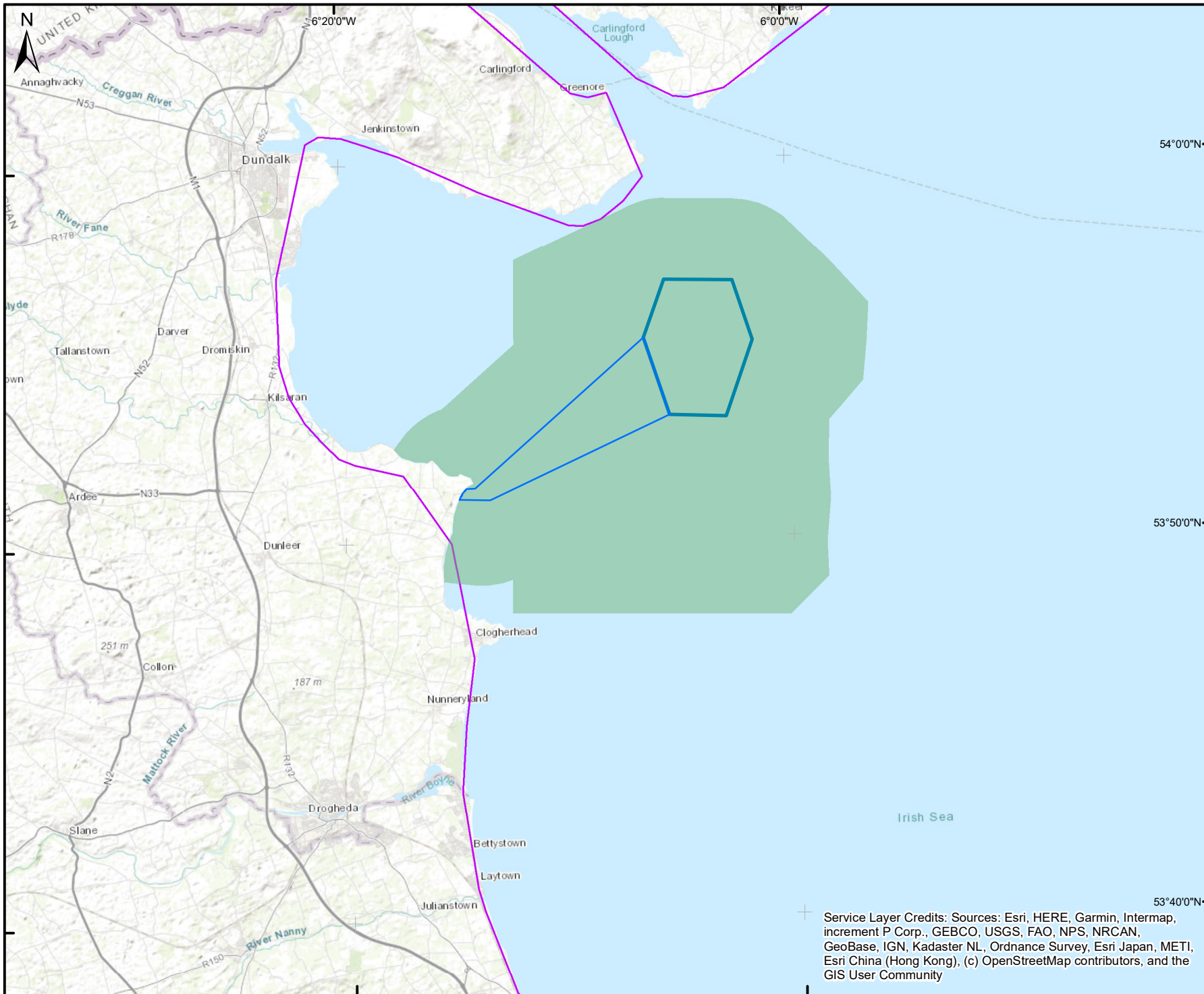
Oriel Windfarm Limited (OWL) (hereafter referred to as “the Applicant”), is promoting the development of the Oriel Wind Farm Project (hereafter referred to as “the Project”).

The Project is an offshore wind farm located in Dundalk Bay (Figure 1-1) located approximately 22 km east of Dundalk town centre and 18 km east of Blackrock. The closest wind turbine will be approximately 6 km from the closest shore on the Cooley Peninsula. The offshore cable corridor extends approximately 11 km southwest from the offshore wind farm area to the landfall south of Dunany Point. The offshore infrastructure of the Project, such as the wind turbines, Offshore Substation (OSS) and inter-array cables, will be located within the offshore wind farm area, which covers approximately 27.7 km², being broadly hexagonal in shape with a length of approximately 5.3 km west to east and 6.6 km north to south. The Project will have 25 wind turbine generators (WTGs) and one OSS located within the offshore wind farm area and will have a Maximum Export Capacity (MEC) of 375 MW.

The offshore cable corridor connects the offshore wind farm area with the landfall south of Dunany Point. The offshore cable corridor is contiguous to the High-Water Mark (HWM) at the landfall and to the southwestern boundary of the offshore wind farm area. The offshore cable corridor is approximately 11 km in length and covers an area of approximately 25.3 km², indicated in Figure 1-1. The WTGs will be connected to each other by a network of inter-array cables, which will also connect into the OSS. The offshore cable will transfer the electricity from the OSS to shore, where it will connect to the onshore infrastructure.

This Marine Megafauna Mitigation Plan (MMMP) presents a summary of findings as assessed in the Environmental Impact Assessment Report (EIAR) on the potentially injurious effects of underwater noise during pile-driving and geophysical surveys, on marine mammals and other megafauna (hereafter referred to collectively as ‘marine megafauna’). Pile-driving has the potential to impact marine mammals and megafauna during the construction phase, and geophysical acoustic surveys have the potential to cause an impact during the operational and maintenance phase. This MMMP is informed by the following sections of the EIAR:

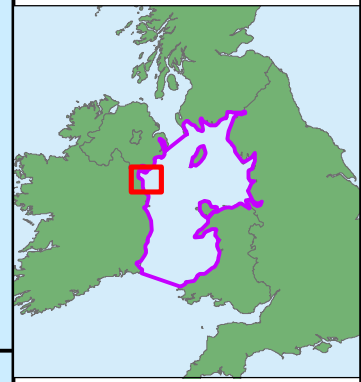
- Volume 2B, chapter 10: Marine Mammals and Megafauna;
- Volume 2B, appendix 10-1: Marine Mammals and Megafauna Technical Report; and
- Volume 2B, appendix 10-2: Subsea Noise Technical Report.



Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor
- Marine Mammal and Megafauna Study Area
- Regional Marine Megafauna Study Area

Data Sources: Client.



Client



ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project
Oriel Wind Farm Project

Title **Figure 1-1
Marine Megafauna Study Area
and Regional Marine
Megafauna Study Area**



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1.2 Purpose of the MMMP

The purpose of this MMMP is to present the means by which the potentially injurious effects of underwater noise resulting from pile-driving activity and geophysical surveys on marine mammals, fish (basking shark) and sea turtles are to be mitigated during the construction and operational and maintenance phases of the Project. Information presented in this MMMP is based on volume 2B, chapter 10: Marine Mammals and Megafauna, which considers the potential impacts of the Project seaward of the HWM during the construction, operational and maintenance, and decommissioning phases. Only those impacts with the potential to cause auditory injury and for which specific measures have been proposed have been included in this MMMP.

The precautionary injury ranges for marine mammals established in the EIAR are based on the underwater noise modelling for the most sensitive species, the parameters for which are based on the project design parameters for the Project. It should be noted that this plan will be updated and finalised pre-construction following the refinement of the project design and refined marine mammal, fish and sea turtle injury ranges, with mitigation measures updated based on these refined ranges. Also any conditions of permission or updated guidelines or changes in industry best practice will be included. The project design parameters informing the assessment of potential impacts on marine mammals and megafauna as a result of underwater noise during pile-driving and geophysical site investigation surveys is presented in Table 1-1.

Table 1-1: Project design parameters used for the assessment of potential impacts on Marine Mammals and Megafauna.

Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
Injury and/or disturbance to marine megafauna from underwater noise during pile-driving	✓	✗	✗	<ul style="list-style-type: none"> 26 monopiles (25 x WTGs and 1 x OSS) of 9.6 m diameter; Absolute maximum hammer energy of 3,500 kJ. On average, a maximum of 5 hours piling per pile across all WTG locations (no more than 8 hours at selected locations) with one pile expected to be installed in each 24-hour period. Maximum days piling = 26 days. 	<p>The spatial extent of noise impacts is driven by key parameters including monopile diameter and hammer size, as well as associated hammer energy required to pile a monopile of this size (see appendix 10-2: Subsea Noise Technical Report).</p> <p>The minimum number of piles within a 24-hour period is likely to lead to the maximum period (number of piling days) over which piling could occur and the maximum within 24 hours would lead to the longest duration on any one day.</p>
Injury and/or disturbance to marine megafauna from elevated underwater noise during site investigation surveys	✗	✓	✗	<p>Routine geophysical surveys of wind turbine foundations, inter-array cables and offshore cable:</p> <ul style="list-style-type: none"> Multibeam echosounder (MBES) expected to be the only method of geophysical survey to be employed; Survey campaigns estimated to occur once every five years for 40-year lifetime of Project; Surveys to be conducted using one survey vessel; Duration of 14 days per survey; 42-day duration per survey campaign (three surveys per campaign); 42 vessel round trips per survey campaign; and Maximum total of 294 survey vessel round trips for lifetime of Project. 	<p>First survey campaign expected to occur in year 5, and final campaign in year 35, equating to seven survey campaigns.</p> <p>Assumes daily vessel trip for every day of each 14-day survey window.</p>
Injury and/or disturbance to marine	✓	✓	✓	<p>Vessel types include jack-up barges, tug/anchor handlers, cable installation vessels, scour/cable protection installation</p>	<p>Greatest range of vessel types and greatest number of round trips.</p>

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Potential impact	Phase ¹			Project design parameters	Justification
	C	O	D		
megafauna from vessels and other construction activities including monopile driving				<p>vessels, guard vessels, survey vessels, Crew Transfer Vessels (CTVs).</p> <p>A maximum 475 vessel round trips during the construction phase, 352 vessel round trips per year during the operational and maintenance phase and 475 vessel round trips during the decommissioning phase.</p> <p>Other construction includes:</p> <ul style="list-style-type: none"> • Monopile drilling at each pile location following piling activity with 6 days drilling for each monopile = cumulative total of 156 days drilling over construction phase; • Cable trenching for inter-array and offshore cable; and • Cable laying for inter-array cables and offshore cable. <p>Offshore construction may take place over a period of 15 months. Operational and maintenance phase is 40 years. Decommissioning duration assumed to be similar to that for construction.</p>	
Changes in the fish and shellfish community affecting marine megafauna prey resources	✓	✓	✓	<p>Project design parameters as described in volume 2B, chapter 9: Fish and Shellfish Ecology for the following impacts:</p> <ul style="list-style-type: none"> • Temporary subtidal habitat loss/disturbance; • Injury and/or disturbance to fish from underwater noise during pile driving; • Increased suspended sediment concentrations and associated sediment deposition; • Long-term habitat loss; and • Electromagnetic Fields (EMF) from subsea electrical cabling. 	See volume 2B, chapter 9: Fish and Shellfish Ecology.
Electromagnetic Fields (EMF) from subsea electrical cabling may disrupt behaviour of basking shark (<i>Cetorhinus maximus</i>)	✗	✓	✗	<p>Presence of inter-array cables and offshore cable:</p> <ul style="list-style-type: none"> • Maximum 41 km of 66 kV inter-array cables; • Maximum 16 km of 220 kV offshore cable; • Burial depths of between 0.5 m to 3 m; • Maximum 50% of inter-array cable route and Maximum 50% of offshore cable may require cable protection. <p>Operational phase is 40 years.</p>	Maximum length of cables and minimum burial depth (greater the depth the more the EMF is attenuated).

1. C = Construction, O = Operation, D = Decommissioning

In addition to measures included in the Project (designed in and management measures (controls)) and mitigation proposed to reduce the injurious impacts on marine megafauna associated with pile-driving and geophysical surveying, a range of procedures will be applied to reduce other environmental impacts of the Project, including development and adherence to an Environmental Management Plan (EMP), which are summarised in Table 1-2.

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Table 1-2: Management plans developed to reduce environmental impacts.

Consents Management Plan	Relevance to MMMP	Where presented
Environmental Management Plan (EMP)	<p>The EMP provides the overarching framework for environmental management during the construction and operational and maintenance phases of the Project.</p> <p>The EMP also sets out the monitoring activities to be completed for the Project, as proposed in the EIAR, including proposed methodologies.</p>	Appendix 5-2

This MMMP has been prepared in accordance with the following guidance and it is considered that compliance with these will reduce the risk of injury to marine mammals and megafauna to negligible levels:

- National Parks and Wildlife Service (NPWS) (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.
- National Marine Fisheries Service (NMFS) (2018) Revision to Technical Guidance for Assessing Effects of Anthropogenic Sound on Marine Mammal Hearing.

1.3 Target species

Marine mammals and megafauna species were characterised based on their abundance and densities at a regional scale (Regional Marine Megafauna Study Area) and local scale (Marine Megafauna Study Area), as detailed in EIAR (see volume 2B, chapter 10: Marine Mammals and Megafauna).

Boat-based visual surveys were conducted between March 2006 and August 2006, and between May 2018 and May 2020 (with the exception of February 2020 to April 2020 owing to COVID-19 restrictions), aerial digital surveys were carried out from April 2020 to September 2020, and Static Acoustic Monitoring (SAM) surveys were conducted between November 2019 and November 2020.

Marine mammals which were sighted regularly in site-specific surveys included minke whale *Balaenoptera acutorostrata* and grey seal *Halichoerus grypus*, and the most common cetacean species in the vicinity of the Project was harbour porpoise *Phocoena phocoena*. Common dolphin *Delphinus delphis* and harbour seal *Phoca vitulina* were sighted occasionally during site surveys, and whilst bottlenose dolphin *Tursiops truncatus* were not sighted during these surveys, a review of published datasets indicates that bottlenose dolphin may also be occasionally present in the area. Risso's dolphin *Grampus griseus* are likely to occur in lower numbers.

Basking shark migrate through the Celtic Sea and Irish Sea during summer months, and during site-specific surveys, two basking sharks were sighted in the vicinity of the Project. Tagging studies have also shown that basking sharks have migrated through this area in previous years (Doherty *et al.*, 2017). Historical records show that three species of marine turtle are likely to regularly occur in Irish waters including leatherback (or 'leathery') turtle, loggerhead turtle *Caretta caretta* and Kemp's Ridley turtle *Lepidochelys kempii* (King and Berrow, 2009). Of these species, the leatherback turtle is distributed around the coast of Ireland, including the Irish Sea, and accounts for 80% of all sea turtle sightings (King and Berrow, 2009).

These species (particularly harbour porpoise, common dolphin and minke whale) use sound for many aspects of their lives and are sensitive to underwater noise. Pile-driving during the construction phase and geophysical surveys during the operational and maintenance phases has the potential to result in elevated levels of subsea noise that are detectable by marine mammals and megafauna above background levels, which could result in injurious or behavioural effects. A detailed account of the marine mammal and megafauna baseline, and the effects of underwater noise on the marine megafauna species presented in this MMMP, can be found in volume 2B, chapter 10: Marine Mammals and Megafauna.

All of the marine mammal and megafauna species which could potentially be affected by the Project are protected by international legislation and/or are important from a conservation perspective at an international

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or national context (see volume 2B, chapter 10: Marine Mammals and Megafauna). Therefore, the value of marine megafauna Important Ecological Features (IEF) was designated as International (Table 1-3).

Table 1-3: Marine mammal and megafauna IEFs and their importance within the Marine Megafauna Study Area.

IEF	Value	Justification
Harbour porpoise	International	Annex II species protected under international legislation and designated feature of Rockabill to Dalkey Island SAC, North Channel SAC, North Anglesey Marine/Gogledd Môn Forol SAC and West Wales Marine/Gorllewin Cymru Forol SAC. Regularly sighted within the Regional Marine Megafauna Study Area.
Bottlenose dolphin	International	Annex II species protected under international legislation and designated feature of Cardigan Bay/Bae Ceredigion SAC
Short-beaked common dolphin	National	Internationally protected species and Ireland Protected Species regularly sighted in the Regional Marine Megafauna Study Area.
Minke whale	National	Internationally protected species and Ireland Protected Species regularly sighted in the Regional Marine Megafauna Study Area.
Grey seal	International	Annex II species protected under international legislation and designated feature of Lambay Island SAC, Lley Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC and Pembrokeshire Marine/Sir Benfro Forol SAC and is a qualifying feature of Cardigan Bay/Bae Ceredigion SAC. Regularly recorded in the Regional Marine Megafauna Study Area, with large haul-outs at Carlingford Lough, Clogherhead, the Skerries, Dublin Bay and Lambay Island.
Harbour seal	International	Annex II species protected under international legislation and designated feature of Lambay Island SAC and is a qualifying feature of Murlough SAC. Regularly recorded in the Regional Marine Megafauna Study Area, with large haul-outs at Carlingford Lough, Dundalk Bay, Clogherhead and the Skerries.
Basking shark	National	Internationally protected species/EPS listed on Ireland's Red List of Threatened Species (list No. 11) and UK BAP Species. Recorded migrating through Regional Marine Megafauna Study Area on an annual basis.
Leatherback turtle	National	Internationally protected species, listed on Ireland's Red List of Threatened Species (list No. 5) and UK BAP Species, reported regularly (largely stranded) in the Regional Marine Megafauna Study Area.

1.4 Measures included in the Project

A number of designed-in and management measures (controls) have been proposed as part of the project design process to reduce the potential for impacts on marine mammals and megafauna. These measures are considered standard industry practice for this type of development and, as there is a commitment to their implementation, are considered an inherent part of the design of the Project. Designed-in and management measures (in addition to this MMMP) have therefore been considered in the assessment of impacts presented in volume 2B, chapter 10: Marine Mammals and Megafauna and are summarised in Table 1-4.

The use of additional measures such as Acoustic Deterrent Devices (ADDs) will also be implemented and is further discussed in section 1.6, however these are mitigation measures and are not considered to be a measure included as part of the Project.

Table 1-4: Measures included in the Project, in addition to the MMMP.

Measures included in the Project	Justification
An Environmental Management Plan (EMP) (see volume 2A, appendix 5-2: Environmental Management Plan) will be implemented during the construction, operational and maintenance, and decommissioning phases of the Project. The EMP will include Project mitigation/monitoring	Measures will be included to ensure that the potential for release of pollutants from construction, operational and maintenance, and decommissioning plant is minimised.

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Measures included in the Project	Justification
<p>measures and commitments and a Marine Pollution Contingency Plan (MPCP) which will include key emergency contact details (e.g. Environmental Protection Agency (EPA)).</p> <p>The EMP will include mitigation such as designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds. In this manner, accidental release of contaminants from vessels will be strictly controlled, thus providing protection for marine life across all phases of the Project.</p>	
<p>During piling operations, soft starts will be used, following NPWS (2014) guidelines. This will involve the implementation of lower hammer energies (i.e. approximately 10-15% of the maximum hammer energy) at the beginning of the piling sequence before energy input is 'ramped up' (increased) over time to required higher levels (also known as a soft-start).</p>	<p>The soft-start will provide an audible cue to allow marine mammals and megafauna to flee the area before piling at increased hammer energy commences. The soft/slow-start will help to mitigate any potential auditory injury.</p>
<p>A Marine Megafauna Vessel Code of Conduct (see appendix 5-5: Marine Megafauna: Vessel Code of Conduct) will be issued to all Project vessel operators, requiring them to:</p> <ul style="list-style-type: none"> • Not deliberately approach marine megafauna; • Keep vessel speed to a minimum; and • Avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride. <p>The Marine Megafauna Vessel Code of Conduct will be adhered to at all times.</p>	<p>To minimise the potential for collision risk, or potential injury to, marine megafauna.</p>
<p>Preparation and implementation of a Cable Specification and Installation Methodology by the appointed contractor prior to the construction phase will include a detailed cable laying plan, including geotechnical data and cable laying techniques.</p> <p>A Cable Repair Method Statement will also be prepared, including a Cable Burial Risk Assessment (CBRA) to inform cable burial depth. A Cable Repair Method Statement will be developed in advance of any cable repair or reburial activities setting out the parameters of the repair or reburial activities and the proposed methodology.</p>	<p>While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and marine mammal and megafauna (and fish and shellfish) receptors, thereby potentially reducing the effect on those receptors.</p>

1.5 Summary of chapter 10: Marine Mammals and Megafauna

1.5.1 Pile-driving

Pile-driving during the construction phase of the Project has the potential to result in elevated levels of subsea noise that are detectable by marine mammals and megafauna above background levels and could result in injurious or behavioural effects on IEFs. A detailed underwater noise modelling assessment has been carried out to investigate the potential for injurious and behavioural effects on marine mammal, fish and sea turtle IEFs as a result of impulsive sounds from pile-driving (volume 2B, appendix 10-2: Subsea Noise Technical Report). The results of this modelling were drawn upon to inform the impact assessment presented in volume 2B, chapter 10: Marine Mammals and Megafauna.

Auditory injury in marine mammals can occur as either a Permanent Threshold Shift (PTS), where there is no hearing recovery, or as a Temporary Threshold Shift (TTS), where recovery from tissue damage is possible. Irish guidance recommends that TTS is included as a potential injury risk as this could impair the ability of animals to use natural sounds, with potential consequences to fitness (NPWS, 2014). In basking sharks and

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sea turtles, injury is assessed as ‘mortality and mortal injury’ (immediate or delayed death) or ‘impairment’ (recoverable injury). This dual criteria approach was used to assess the potential for PTS and TTS in marine mammals and ‘mortality and mortal injury’ and ‘impairment’ in basking shark and sea turtles.

The most likely response of an animal exposed to noise levels that could induce TTS or impairment is, however, to flee the ensonified area. It is therefore considered that the behavioural response (disturbance) can overlap with potential injury ranges, and animals exposed to noise levels with the potential to induce TTS or impairment are likely to simply move away from the area.

Injury from PTS and disturbance from TTS were investigated with respect to two metrics over the entire piling sequence from hammer initiation to maximum hammer energy (3,500 kJ) based on one pile being installed within a 24-hour period (see project design parameters in Table 1-1). Peak Sound Pressure Level (SPL_{pk}) was used to determine ranges for instantaneous injury at the highest point over the piling sequence whilst cumulative Sound Exposure Level (SEL_{cum}) was modelled to estimate the injury range from cumulative exposure as an animal flees the area. The SEL_{cum} metric can lead to overestimates in effect ranges which means that subsea noise modelling results in a precautionary assessment due to the conservative assumptions adopted, namely:

- Maximum hammer energy (3,500 kJ) would be reached at all locations;
- Subsea noise would remain impulsive at all distances, and not transition to a non-impulsive character;
- The soft start procedure does not include short pauses in piling which would reduce the noise exposure that fleeing animals experience;
- Animals would swim away from the noise source at the onset of activity at a constant rate and in a straight line; and
- Time spent at the surface, where sound levels are reduced, was not considered.

Where insufficient data existed to determine a quantitative guideline value, the risk was categorised in relative terms as “high”, “moderate” or “low” at three distances from the source: “near” (i.e. in the tens of metres), “intermediate” (i.e. in the hundreds of metres) or “far” (i.e. in the thousands of metres).

For all species, except minke whale, injury ranges based on the SPL_{pk} metric were greater, with the greatest distance being 236 m for harbour porpoise, for the first strike following ramp up. For minke whale the maximum injury range, based on the SEL_{cum} metric, was 394 m. Disturbance ranges were predominantly greater for SEL_{cum} across species (maximum 8,060 m for minke whale), except for bottlenose dolphin and common dolphin, which had a greater disturbance range of 59 m for SPL_{pk} . A summary of injury ranges for all IEFs is presented in Table 1-5.

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Table 1-5: Summary of marine mammal injury (PTS and TTS) onset acoustic thresholds (NMFS, 2018) and criteria for onset of injury to fish due to impulsive noise (Popper *et al.*, 2014) (N/E = threshold not exceeded). White rows indicate SPLpk, grey rows indicate SELcum, and blank cells indicate scenarios which were not modelled.

Species	PTS or 'Mortality and mortal injury'			TTS or 'Impairment'		
	Threshold	Range (m)		Threshold	Range (m)	
		Soft Start - First Strike	Max Energy		Soft Start - First Strike	Max Energy
Harbour porpoise	202 dB re 1 µPa	236	489	196 dB re 1 µPa	344	713
	155 dB re 1 µPa ² s	168	-	140 dB re 1 µPa ² s	5,980	-
Bottlenose dolphin	230 dB re 1 µPa	41	84	224 dB re 1 µPa	59	123
	185 dB re 1 µPa ² s	N/E	-	170 dB re 1 µPa ² s	12	-
Common dolphin	230 dB re 1 µPa	41	84	224 dB re 1 µPa	59	123
	185 dB re 1 µPa ² s	N/E	-	170 dB re 1 µPa ² s	12	-
Minke whale	219 dB re 1 µPa	81	168	213 dB re 1 µPa	118	245
	183 dB re 1 µPa ² s	394	-	168 dB re 1 µPa ² s	8,060	-
Grey seal	218 dB re 1 µPa	86	179	212 dB re 1 µPa	126	261
	185 dB re 1 µPa ² s	19	-	170 dB re 1 µPa ² s	1,330	-
Harbour seal	218 dB re 1 µPa	86	179	212 dB re 1 µPa	126	261
	185 dB re 1 µPa ² s	19	-	170 dB re 1 µPa ² s	1,330	-
Basking shark	>213 dB re 1 µPa	118	245	>213 dB re 1 µPa	118	245
	>219 dB re 1 µPa ² s	N/E	-	>186 dB re 1 µPa ² s	770	-
Leatherback turtle	>207 dB re 1 µPa	172	357	(Near) High		
	210 dB re 1 µPa ² s	17	-	(Intermediate) Low (Far) Low		

Therefore, even considering the conservative assumptions of the subsea noise modelling that estimated highly precautionary injury ranges, across all species, the maximum range over which injury could occur was predicted to be less than the standard 1,000 m mitigation zone for pile-driving proposed by NPWS (2014). A summary of the assessments for injury and disturbance to IEFs, considering measures included in the Project only, is presented in Table 1-6, and full details are presented in volume 2B, chapter 10: Marine Mammals and Megafauna.

Table 1-6: Significance of the effect to IEFs as a result of injury and disturbance from underwater noise during pile-driving with measures included in the Project (soft start and MMMP).

IEF	Magnitude of Impact	Sensitivity of Receptor	Significance of the effect	Significant / Not significant
Disturbance				
Harbour porpoise	Low	Medium	Slight adverse	Not significant
Bottlenose dolphin	Low	Medium	Slight adverse	Not significant
Common dolphin	Low	Medium	Slight adverse	Not significant
Minke whale	Low	Medium	Slight adverse	Not significant
Grey seal	Low	Medium	Slight adverse	Not significant
Harbour seal	Low	Medium	Slight adverse	Not significant

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IEF	Magnitude of Impact		Sensitivity of Receptor		Significance of the effect		Significant / Not significant
Basking shark	Low		Low		Imperceptible		Not significant
Leatherback turtle	Low		Low		Imperceptible		Not significant
Injury	PTS	TTS	PTS	TTS	PTS	TTS	
Harbour porpoise	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Bottlenose dolphin	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Common dolphin	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Minke whale	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Grey seal	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Harbour seal	Low	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Basking shark	Negligible	Negligible	High	Low	Slight adverse	Slight adverse	Not significant
Leatherback turtle	Negligible	Negligible	High	Low	Slight adverse	Slight adverse	Not significant

Mitigation measures will be applied by use of an ADD to reduce the potential for injury, particularly to marine mammals. There are a number of ADDs on the market with different sound source characteristics (see McGarry *et al.*, 2022) and a suitable device will be selected based on the key species requiring mitigation for the Project. The selected device will typically be deployed from the piling vessel and activated for a pre-determined duration to allow animals sufficient time to move away from the sound source, whilst also minimising the additional noise introduced into the marine environment. The type of ADD and approach to deployment (including activation time and procedure) will be discussed and agreed with relevant stakeholders prior to construction.

Noise modelling was carried out for the SEL_{cum} metric to determine the potential efficacy of using an ADD to deter marine mammals from the injury zone (see volume 2B, appendix 10-2: Subsea Noise Technical Report). The modelled scenario included the activation of an ADD for a period of 15 minutes prior to initiation of piling and was compared to the scenario with measures included in the Project only (i.e. initiation + soft start + ramp up) to determine whether deployment of an ADD was of potential benefit to reducing the risk of injury to marine mammals. There is no evidence for the effectiveness of ADDs as a tool to deter basking shark and sea turtle and therefore this was not considered in the modelling for these species.

Results of modelling the use of an ADD suggest that the risk of injury occurring in marine mammal receptors would be reduced. For example, based on the SEL_{cum} metric, ADD use would avoid thresholds for PTS being exceeded in all species as animals would flee beyond the injury zones prior to the start of piling. In particular, minke whale, for which modelled SEL_{cum} injury ranges were greatest (Table 1-5) have been shown to make directed movements and increase their net swim speed at distances of greater than 1,000 m (which coincides with the mitigation zone for pile-driving proposed by NPWS) from an ADD (Boisseau *et al.*, 2021).

The use of an ADD will also reduce the risk of TTS occurring in marine mammals. With an ADD deployed the range at which the SEL_{cum} threshold for TTS would be reduced to 5,980 m for minke whale, 4,620 m for harbour porpoise and for mid-frequency cetaceans and pinnipeds the TTS thresholds would not be exceeded (Table 1-7). These ranges are likely to be highly conservative overestimates, although this subsea noise modelling illustrates that the use of an ADD can reduce the risk of temporary auditory impairment.

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Table 1-7 Changes in range of injury (PTS) and disturbance (TTS) from unmitigated piling (including designed-in and management measures) and mitigated piling (including use of ADD).

Species	Threshold (Weighted) SEL _{cum}	Measures	Range (m)
Harbour porpoise	PTS - 155 dB re 1 µPa ² s	Soft start	168
	TTS - 140 dB re 1 µPa ² s		5,980
	PTS - 155 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 140 dB re 1 µPa ² s		4,620
Bottlenose dolphin	PTS - 185 dB re 1 µPa ² s	Soft start	N/E
	TTS - 170 dB re 1 µPa ² s		12
	PTS - 185 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 170 dB re 1 µPa ² s		N/E
Common dolphin	PTS - 185 dB re 1 µPa ² s	Soft start	N/E
	TTS - 170 dB re 1 µPa ² s		12
	PTS - 185 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 170 dB re 1 µPa ² s		N/E
Minke whale	PTS - 183 dB re 1 µPa ² s	Soft start	394
	TTS - 168 dB re 1 µPa ² s		8,060
	PTS - 183 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 168 dB re 1 µPa ² s		5,980
Grey seal	PTS - 185 dB re 1 µPa ² s	Soft start	19
	TTS - 170 dB re 1 µPa ² s		1,330
	PTS - 185 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 170 dB re 1 µPa ² s		N/E
Harbour seal	PTS - 185 dB re 1 µPa ² s	Soft start	19
	TTS - 170 dB re 1 µPa ² s		1,330
	PTS - 185 dB re 1 µPa ² s	Soft start + ADD	N/E
	TTS - 170 dB re 1 µPa ² s		N/E

A summary of the assessments for injury and disturbance to IEFs, considering measures included in the Project and the use of an ADD, is presented in Table 1-8, and full details are presented in volume 2B, chapter 10: Marine Mammals and Megafauna.

Table 1-8: Significance of the effect to IEFs as a result of injury and disturbance from underwater noise during pile-driving with measures included in the Project (MMMP and soft start) plus mitigation (ADD).

IEF	Magnitude of Impact	Sensitivity of Receptor	Significance of the effect	Significant / Not significant
Disturbance				
Harbour porpoise	Low	Medium	Slight adverse	Not significant
Bottlenose dolphin	Low	Medium	Slight adverse	Not significant
Common dolphin	Low	Medium	Slight adverse	Not significant
Minke whale	Low	Medium	Slight adverse	Not significant
Grey seal	Low	Medium	Slight adverse	Not significant
Harbour seal	Low	Medium	Slight adverse	Not significant
Basking shark	Low	Low	Imperceptible	Not significant

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IEF	Magnitude of Impact		Sensitivity of Receptor		Significance of the effect		Significant / Not significant
	PTS	TTS	PTS	TTS	PTS	TTS	
Leatherback turtle	Low		Low		Imperceptible		Not significant
Injury	PTS	TTS	PTS	TTS	PTS	TTS	
Harbour porpoise	Negligible	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Bottlenose dolphin	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant
Common dolphin	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant
Minke whale	Negligible	Medium	High	Low	Slight adverse	Slight adverse	Not significant
Grey seal	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant
Harbour seal	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant
Basking shark	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant
Leatherback turtle	Negligible	Negligible	High	Low	Slight adverse	Imperceptible	Not significant

It is also important to highlight the potential magnitude of effect and sensitivity of marine mammals to the ADD itself. Whilst ADDs deployed for such short durations are unlikely to lead to injury there may be some trade-off with an increase in disturbance during the period of activation. Depending on the device employed, ADDs may elicit a strong behavioural response and lead to displacement over potentially large ranges (a kilometre or more) for periods of time longer than the activation of the device itself. Whilst this is useful for reducing the risk of injury to marine mammals there needs to be a balance to ensure that ADDs do not lead to significant additional disturbance themselves. This can be achieved by optimising both ADD source signals and deployment schedules (Thompson *et al.*, 2020). Since the effect of ADDs on marine mammals is likely to be a short-term disturbance response over a relatively localised area (within a maximum of few kilometres) and animals are likely to quickly recover to baseline levels (within a few hours) the magnitude of disturbance is not considered to be significant.

1.5.2 Geophysical acoustic surveys

Site investigation surveys to facilitate the inspection of offshore infrastructure foundations, inter-array cables and offshore cable during the operational and maintenance phase of the Project have the potential to cause direct or indirect effects (including injury or disturbance) on marine megafauna IEFs. An underwater noise modelling assessment was carried out to investigate the potential for injurious and behavioural effects as a result of geophysical surveys using the latest criteria (volume 2B, appendix 10-2: Subsea Noise Technical Report), which is drawn upon in the information below.

Underwater noise modelling for geophysical surveys has been undertaken based upon the likely parameters of the equipment expected to be employed. Here, the Kongsberg EM710 MBES unit has been modelled operating at 105 kHz, 231 dB re: 1µPa @ 1 m (rms) (see Table 1-9 below), although this equipment can typically work at a range of signal frequencies, depending on the distance to the seabed and the required resolution. For sonar-like sources the signal is highly directional, acting like a beam, and is emitted in pulses. Sonar-based sources are considered as continuous (non-impulsive) because they generally comprise a single (or multiple discrete) frequency as opposed to a broadband signal with high kurtosis, high peak pressures and rapid rise times (see volume 2B, appendix 10-2: Subsea Noise Technical Report, wherein a full description of the source sound levels for geophysical survey activities is provided).

Table 1-9: Typical Sonar-based survey equipment parameters used in assessment.

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Survey Type	Unit	Frequency (kHz)	Source Level (dB re 1 μ Pa (rms))	Pulse Rate (s ⁻¹)	Pulse Width (ms)	Beam Width (degrees)	Swathe Beam Width (degrees)
MBES	Kongsberg EM710	105	231	30	0.2	2	140

Noise modelling was undertaken only for MBES surveying methods and did not consider non-impulsive sources to be a key potential impact for basking shark and sea turtles. These species were subsequently screened out, and the focus of the assessment was on marine mammal species only. As for the impact of pile-driving, the potential effect upon marine mammals was either auditory injury (PTS or TTS) or behavioural disturbance.

Potential impacts of site investigation surveys depend on the characteristic of the sound source, survey design, frequency bands and water depth. Sonar-based sources have very strong directivity which effectively means that there is only potential for injury when a marine mammal is directly underneath the sound source. Once the animal moves outside of the main beam, there is no potential for injury.

Based on underwater noise modelling presented in volume 2B, appendix 10-2: Subsea Noise Technical Report, PTS has the potential to occur out to a maximum of 227 m for harbour porpoise (Table 1-10), up to 124 m for dolphin species and up to 12 m for minke whale. and in pinniped species the maximum range for PTS to occur is out to 34 m from the sound source. TTS has the potential to occur out to a maximum of 449 m in harbour porpoise, 172 m for dolphin species, and up to 107 m for minke whale. In pinniped species this range is predicted out to 123 m from the sound source.

Table 1-10: PTS and TTS onset thresholds and potential impact ranges for marine mammal species during non-impulsive MBES geophysical site investigation surveys, based on comparison to Southall *et al.* (2019) SEL thresholds.

Species	Hearing group (NMFS, 2018)	Injury type	SEL threshold (dB re 1 μ Pa ² s)	Impact range (m)
Minke whale	LF	PTS	199	12
		TTS	179	107
Bottlenose dolphin	MF	PTS	198	124
		TTS	178	172
White-beaked common dolphin	MF	PTS	198	124
		TTS	178	172
Harbour porpoise	HF	PTS	173	227
		TTS	153	449
Harbour seal	PCW	PTS	201	34
		TTS	181	123
Grey seal	PCW	PTS	201	34
		TTS	181	123

The number of marine mammals with the potential to be injured within the modelled ranges for PTS and TTS presented in Table 1-10 was estimated using the most up to date species-specific density estimates. Due to low predicted injury ranges, for all marine mammal species, it is predicted that no more than one animal has the potential to experience PTS or TTS as a result of geophysical site investigation surveys.

Mitigation for injury during geophysical site investigation surveys from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with NPWS guidance (NPWS, 2014). A soft start will also be implemented where this is within technical capabilities of the survey equipment.

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The estimated maximum range for onset of disturbance is based on underwater noise levels being greater than a threshold of 120 dB re 1 μ Pa (rms) for all marine mammals (see volume 2B, appendix 10-2: Subsea Noise Technical Report). The disturbance range as a result of geophysical site-investigation surveys will be higher than those presented for injury, so the predicted range beyond which no marine mammals are expected to experience disturbance is approximately 1,410 m. Considering the high degree of variation between studies relating to the onset of behavioural effects due to non-impulsive sound, it is recommended that any predicted disturbance ranges are viewed as probabilistic, and potentially over-precautionary.

There is likely to be a proportional response in those animals experiencing disturbance, and not all individuals will be disturbed to the same extent. Similarly, the life history of an individual, and the context of the reception of sound, will also influence the likelihood for an aversive response. These impacts will not be continuous over the entire operational and maintenance phase: site investigation surveys will instead be carried out over a period of days within any given survey window. Therefore, given the limited quantitative information available, any simplified calculation is likely to produce an overestimation of the number of animals potentially disturbed, particularly given the intermittent and highly directional nature of sound from sonar-based survey methods like MBES. Nonetheless, an estimate of the number of animals for each species with the potential to be disturbed is presented in Table 1-11.

Table 1-11: Maximum number of animals potentially affected by disturbance arising from geophysical site investigation surveys.

Species	Hearing group (NMFS, 2018)	Estimated density (animals per km ²)	Number of animals within zone of disturbance	Percentage of population (%)
Minke whale	LF	0.040 – 0.260 ¹	2	0.007
Bottlenose dolphin	MF	0.008 – 0.036 ²	<1	0.057
White-beaked common dolphin	MF	0.008 ³	<1	0.001
Harbour porpoise	HF	0.570 – 1.330 ¹	9	0.008
Harbour seal	PCW	0.010 – 0.610 ⁴	4	0.068
Grey seal	PCW	0.090 – 0.210 ¹	2	0.008

A summary of the assessments for injury and disturbance to marine mammal IEFs, considering measures included as part of the Project, is presented in Table 1-12, and full details are presented in volume 2B, chapter 10: Marine Mammals and Megafauna.

Table 1-12: Significance of the effect to marine mammal IEFs as a result of injury and disturbance from underwater noise during routine geophysical surveys.

IEF	Effect	Magnitude	Sensitivity	Significance	Significant/Not significant
All marine mammal species	PTS	Low	High	Slight adverse	Not significant
	TTS	Low	Medium	Slight adverse	Not significant
	Disturbance	Low	Medium	Slight adverse	Not significant

¹ Mean monthly average and mean monthly maximum recorded during site-specific boat-based surveys (2018 -2020)

² SCANS-III Block E (western Irish Sea) data collected summer 2016 (Hammond *et al.*, 2017)

³ Insufficient records of common dolphin in block E during SCANS-III surveys therefore these data are from SCANS-II for Block O (Irish Sea) collected summer 2005 (Hammond *et al.*, 2013)

⁴ SMRU at-sea densities

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1.6 Mitigation methods and procedures

The mitigation measures presented below include designed-in and management measures (measures included in the Project) and mitigation measures to reduce the risk of injury to marine mammals as described in volume 2B, chapter 10: Marine Mammals and Megafauna.

1.6.1 Pile-driving

As per the NPWS (2014) guidance, a 30-minute constant effort pre-piling search will be undertaken by at least two accredited and experienced marine mammal observers (MMO) using binoculars and a range finding stick as required and a Passive Acoustic Monitoring (PAM) operator to monitor the specified 1,000 m radial mitigation zone in order to minimise the likelihood of marine mammals being present within this range.

In addition to visual and acoustic monitoring, an ADD will be deployed at the start of the pre-piling search in close proximity to the pile to be installed. The ADD will be activated for a minimum period of 15 minutes to allow animals sufficient time to disperse, while also minimising the additional noise produced by the device and emitted into the marine environment. Visual and acoustic monitoring will continue throughout the ADD deployment to ensure that marine mammals have left the mitigation zone prior to the start of piling.

Pile driving activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible (including in circumstances in which poor visibility prevents the 1,000 m mitigation zone from being visually monitored) the sound-producing activities will be postponed until effective visual monitoring is possible.

After the 30-minute pre-piling search and ADD activation period has elapsed, the piling initiation, soft start and ramp up designed-in measures will commence with hammer initiation at the lowest hammer energy and strike rate (525 kJ). The ADD will be turned off immediately after the piling activity has commenced. The soft start is the gradual, incremental increase of piling power over a minimum of 20 minutes. This allows time for marine mammals or megafauna to move away from the noise source, thereby reducing the risk of exposing animals to noise levels which can cause injury.

The initiation and soft start stages allow for alignment piles and for marine megafauna to leave the area and involve a hammer energy of 525 kJ. The ramp up stage is a progressive increase in hammer energy following the soft start and involves an initial hammer energy of 525 kJ which builds 2,500 kJ over the 9-minute period. The maximum hammer energy proposed for the Project is 3,500 kJ. However, the actual energy used when piling will be significantly lower for the majority of the time and the driving energy will be raised to 3,500 kJ only when absolutely necessary. A summary of the piling stages and associated strike energies is presented in Table 1-13.

Table 1-13: Piling scenario for monopile installation using a maximum hammer energy of 3,500 kJ.

Stage	Energy (kJ)	SEL per strike (dB re 1 $\mu\text{Pa}^2\text{s}$)	SPL _{pk} (dB re 1 μPa)	Duration (mins)	Strike rate (strikes per minute)	Number of strikes
Initiation	525	205	246	1	6	6
Soft start	525	205	246	20	30	600
Ramp up	525 to 2,500	205 - 212	246 - 255	9	30	270
Standard operation	2,500	212	255	150	30	4500
Full power	3,500	213	258	120	30	3600
Total	-	-	-	300	-	8,976

These above activities were included in subsea noise modelling (with the inclusion of an ADD for 15 minutes prior to commencement of any piling activity) in volume 2B, appendix 10-2: Subsea Noise Technical Report. The ADD itself was assumed to not contribute towards any injury to marine megafauna.

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If marine megafauna are detected within the mitigation zone during the pre-piling search of soft-start, piling will not commence or at least the hammer energy should not be further increased until at least 30 minutes after the last visual or acoustic detection of the animal. The MMOs and PAM operative will track any marine megafauna detected and ensure that they have left the mitigation zone before piling commences or the soft start continues. Once the ramp up procedure commences there is no requirement to halt or discontinue the pile-driving if marine mammals are detected within the mitigation zone. Likewise, if marine megafauna are detected in the mitigation zone during piling at full power, there will be no requirement to cease piling. It may also not be possible to stop piling at full power due to engineering restrictions. Figure 1-2 illustrates the sequence of events and lines of communication required to implement the MMMP.

If for any reason there is a break in piling activity for greater than 10 minutes, then the pre-piling search and ADD activation, and a full soft start and ramp up procedure should be repeated before piling recommences.

The designed-in and mitigation measures detailed in this MMMP reduce the risk of auditory injury to an acceptable level in terms of PTS. With mitigation in place, the potential effect of piling (auditory injury) on marine megafauna is considered to be of **imperceptible or slight significance**, which is not significant in EIA terms.

Marine Mammal Observer

During daylight hours at least two dedicated and qualified Marine Mammal Observer (MMO) will conduct a visual search of the mitigation zone and conduct the pre-start searches from a vessel prior to the start of the piling (see section 1.6 for details). Visual monitoring for marine mammals will be conducted from a suitable platform on the vessel such as the ship's bridge, that allows 360-degree visualisation, and full coverage of the mitigation zone. MMOs must concentrate their efforts on the measures to be taken in advance of and during commencement, breaks in and resumption of the sound-producing activity (NPWS, 2014).

The MMO will be equipped with reticule binoculars and Marine Mammal Reporting forms and will be capable of determining the extent of the mitigation zone in relation to their viewing platform. A range stick may be used to aid the estimation of distance of the sighting from the survey vessel. The lead MMO should also be equipped with a two-way radio to ensure communication with both the vessel crew and the PAM operator. This is to allow any visual or acoustic detections of marine mammals or megafauna in the mitigation zone and any subsequent delay required to the commencement of piling to be communicated quickly and effectively between all parties. The MMO will be responsible for recording all marine mammal sightings in the appropriate format, along with other environmental data. Together with the PAM Operator, the MMO will be responsible for compiling all the data on marine mammal observations and mitigation activities for reporting to NPWS.

The MMO must be experienced and familiar with the Irish regulatory procedures pertaining to managing risk to marine mammals from underwater sound and must be provided with full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement, to ensure compliance. The MMO will have the necessary authority (or support by Works Superintendent) to implement the plan and stop works if necessary.

PAM Operator

PAM will be undertaken during pre-start, ramp-up and piling activities. A vertical PAM system will be used, as opposed to a towed system as the vessels are likely to use dynamic positioning rather than transiting during the pre-start monitoring phase.

Two dedicated and qualified PAM Operators will be responsible for deployment, maintenance and operation of the PAM hydrophone, including spares. Both PAM Operators will be suitably trained in PAM and the use of PAMGuard, with training having been provided by an appropriate organisation (e.g. Seiche). PAM Operators will also have an appropriate level of field experience (i.e. a minimum of one-year PAM experience on offshore projects).

PAM Operators will be based on the vessel together with the MMO. PAM Operators will be responsible for recording all acoustic marine mammal detections in the appropriate format, and together with the MMO, will be responsible for compiling all the data on marine mammal observations and mitigation activities for reporting to NPWS. The PAM operator should also be equipped with a two-way radio to ensure communication with both the vessel crew and the lead MMO. This is to allow any visual or acoustic

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detections of marine mammals or megafauna in the mitigation zone and any subsequent delay required to the commencement of piling to be communicated quickly and effectively between all parties.

PAM Operators must be experienced and familiar with the regulatory procedures pertaining to managing risk to marine mammals from underwater sound, and to ensure compliance, must be provided with full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement. PAM Operators will have the necessary authority (or support by Works Superintendent) to implement the plan and stop works if necessary.

ADD Operator

A trained and dedicated ADD operator will be responsible for ADD maintenance, operation and reporting. The ADD Operator will be responsible for deploying the ADD from the installation vessel, verifying the operation of the ADD before deployment, operating the ADD, ensuring that batteries are fully charged and that spare equipment is available.

The ADD Operator will also record and report to the Works Superintendent/MMO/PAM on all ADD and piling activity so the details of any ADD used (see section 1.6), and any relevant observations on their efficacy can be reported as a part of the Operational/Marine Mammal Observer/Passive Acoustic Monitoring Report (see section 1.8).

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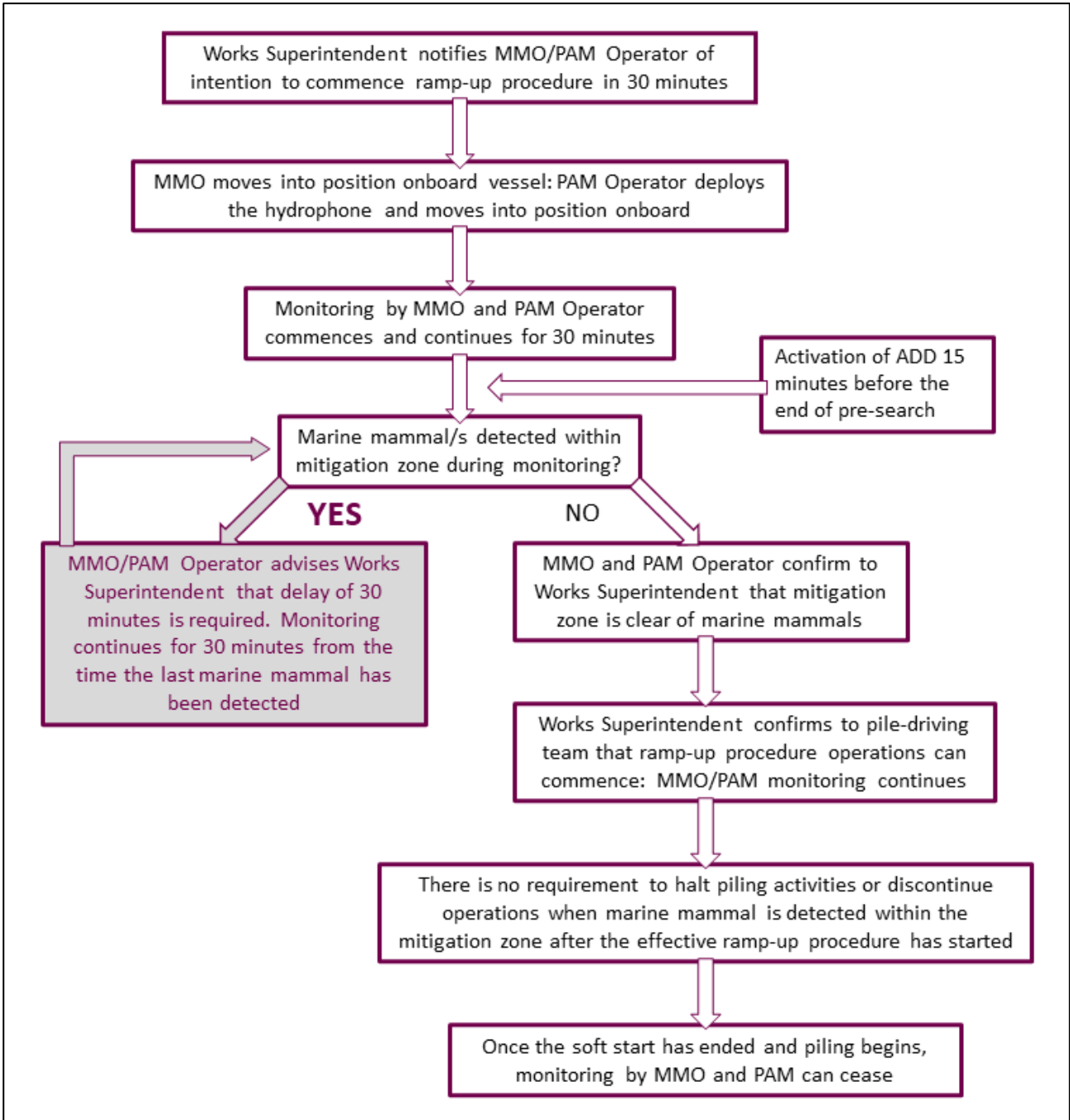


Figure 1-2: Task and communication plan for piling procedures start-up.

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1.6.2 Field records during pile-driving

Operations report

As per NPWS guidelines (2014) the Operations report will be provided to NPWS on completion of pile-driving activities as outlined below and must include use of the standard data forms provided in annex A.1:

- Details of the Client/Contractor involved in the plan/project;
- Details of the Platform/Vessel type(s) participating in the plan/project;
- Survey reference number supplied by the Regulatory Authority or other statutory body;
- Date and location of the plan/project;
- Latitudes, longitudes or grid references for the area of operations;
- Specifications and acoustic characteristics of all sound-producing equipment used;
- A daily log of how and when the sound-producing equipment was used; and
- Information on any technical problems encountered during pre-start-up procedures or during full scale operation/activity.

Marine Mammal Observer/PAM Report

The Marine Mammal Observer/Passive Acoustic Monitoring Report will include:

- An Executive Summary: a concise text at the beginning of the report highlighting the MMO/PAM work undertaken and summarising in turn:
 - All marine mammal detections made during the piling;
 - All detections made prior to the commencement of the piling activity (pre-search and ramp-up procedures);
 - All operational responses to the presence of animals in the area and the associated outcomes;
 - All occurrences of night-time operation/activity, continuation into poor weather and stoppages;
 - Any and all problems arising during implementation of the prescribed mitigation;
 - Any recommendations based on the project and any marine mammal sightings/behaviour encountered during the piling operations which could benefit future projects; and
 - A concluding statement regarding the operational efficacy of the mitigation measures performed.
- Date and location(s) of the plan/project;
- Name, address and qualifications of the MMO, PAM and ADD operators on the Platform/Vessel;
- Name of any other Platform/Vessel involved in the operation/activity;
- Latitudes, Longitudes or Grid references for the area(s) of operations monitored by the MMO;
- Details of the observation platform used for marine mammal monitoring, including its height above sea level;
- Details of all sound-producing operations/activities undertaken during the period of survey;

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- Details of monitoring watches conducted for marine mammals;
- Details of all marine mammal sightings recorded during monitoring watches;
- Details of all marine mammal sightings recorded outside monitoring watches (e.g. incidental observations), including records from additional personnel on board;
- Details of any problems encountered during marine mammal monitoring, start-up procedures or during full scale operation/activity; and
- Details of any instances of non-compliance with NPWS guidelines.

1.6.3 Geophysical acoustic surveys

As per the NPWS (2014) guidance, a constant effort pre-survey search will be undertaken by at least two accredited and experienced MMOs (using binoculars and a range finding stick as required) and a PAM Operator to monitor the specified 500 m radial mitigation zone to minimise the likelihood of marine mammals being present within this range. In waters up to 200 m deep (which includes the offshore array area and offshore cable corridor), the MMO shall conduct pre-start-up visual monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected by the MMO within the mitigation zone.

Sound-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible (including in circumstances in which poor visibility prevents the 500 m mitigation zone from being visually monitored) the sound-producing activities shall be postponed until effective visual monitoring is possible.

An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.

This prescribed pre-survey monitoring shall subsequently be followed by a ramp-up procedure (i.e. a soft-start) which should include continued monitoring by the MMO.

In commencing a geophysical acoustic survey operation, the following soft-start procedure must be used, including during any testing of acoustic sources, where the output peak SPL from any source exceeds 170 dB re: 1 μ Pa @ 1 m:

- Where it is possible according to the operational parameters of the equipment concerned, the device's acoustic energy output shall commence from a lower energy start-up (i.e. a peak SPL not exceeding 170 dB re 1 μ Pa @ 1 m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20 minutes;
- This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period; and
- Where the acoustic output measures outlined in steps (a) and (b) are not possible according to the operational parameters of any such equipment, the device shall be switched "on" and "off" in a consistent sequential manner over a period of 20 minutes prior to commencement of the full necessary output.

In all cases where a soft-start is employed the delay between the end of the soft-start and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.

Once the soft-start commences, there is no requirement to halt or discontinue the procedure if weather or visibility conditions deteriorate, nor if marine mammals occur within the 500 m radial mitigation zone. Marine mammals present at this point are deemed to have entered the ensonified area willingly.

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If there is a break in sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut-down, survey line or station change) then all pre-survey monitoring and a subsequent soft-start procedure (where appropriate) must be undertaken.

For higher output survey operations which have the potential to produce injurious levels of underwater sound (including the MBES methods expected to be employed in geophysical surveying for the Project) as informed by the associated risk assessment, there will be a regulatory requirement to adopt a shorter 5-10 minute break limit after which period all pre-survey monitoring and a subsequent soft-start (where appropriate following pre-survey monitoring) shall recommence as for start-up.

The designed-in and mitigation measures detailed in this MMMP reduce the risk of auditory injury to an acceptable level in terms of PTS. With mitigation in place, the potential effect of geophysical acoustic surveys (auditory injury) on marine megafauna is considered to be of **slight significance**, which is not significant in EIA terms. Figure 1-3 illustrates the sequence of events and lines of communication required to implement the MMMP.

Marine Mammal Observer

During daylight hours at least two dedicated and qualified MMOs will conduct a visual search of the mitigation zone and conduct the pre-start searches from a vessel prior to the start of surveying (see section 1.6 for details). Visual monitoring for marine mammals will be conducted from a suitable platform on the vessel such as the ship's bridge, that allows 360-degree visualisation, and full coverage of the mitigation zone. MMOs must concentrate their efforts on the measures to be taken in advance of and during commencement, breaks in and resumption of the sound-producing activity (NPWS, 2014).

The MMO will be equipped with reticule binoculars and Marine Mammal Reporting forms and will be capable of determining the extent of the mitigation zone in relation to their viewing platform. A range stick may be used to aid the estimation of distance of the sighting from the survey vessel. The lead MMO should also be equipped with a two-way radio to ensure communication with both the vessel crew and the PAM operator. This is to allow any visual or acoustic detections of marine mammals or megafauna in the mitigation zone and any subsequent delay required to the commencement of surveying to be communicated quickly and effectively between all parties. The MMO will be responsible for recording all marine mammal sightings in the appropriate format, along with other environmental data. Together with the PAM Operator, the MMO will be responsible for compiling all the data on marine mammal observations and mitigation activities for reporting to NPWS.

The MMO must be experienced and familiar with the Irish regulatory procedures pertaining to managing risk to marine mammals from underwater sound and must be provided with full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement, to ensure compliance. The MMO will have the necessary authority (or support by Works Superintendent) to implement the plan and stop works if necessary.

PAM Operator

PAM will be undertaken during pre-start, ramp-up/soft-start and surveying activities. Two dedicated and qualified PAM Operators will be responsible for deployment, maintenance and operation of the PAM hydrophone, including spares. Both PAM Operators will be suitably trained in PAM and the use of PAMGuard, with training having been provided by an appropriate organisation (e.g. Seiche). PAM Operators will also have an appropriate level of field experience (i.e. a minimum of one-year PAM experience on offshore projects).

PAM Operators will be based on the vessel together with the MMO. PAM Operators will be responsible for recording all acoustic marine mammal detections in the appropriate format, and together with the MMO, will be responsible for compiling all the data on marine mammal observations and mitigation activities for reporting to NPWS. The PAM operator should also be equipped with a two-way radio to ensure communication with both the vessel crew and the lead MMO. This is to allow any visual or acoustic detections of marine mammals or megafauna in the mitigation zone and any subsequent delay required to the commencement of surveying to be communicated quickly and effectively between all parties.

PAM Operators must be experienced and familiar with the Irish regulatory procedures pertaining to managing risk to marine mammals from underwater sound and to ensure compliance must be provided with

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full details of all licence/consent conditions relevant to the performance of their role in advance of activity commencement. PAM Operators will have the necessary authority (or support by Works Superintendent) to implement the plan and stop works if necessary.

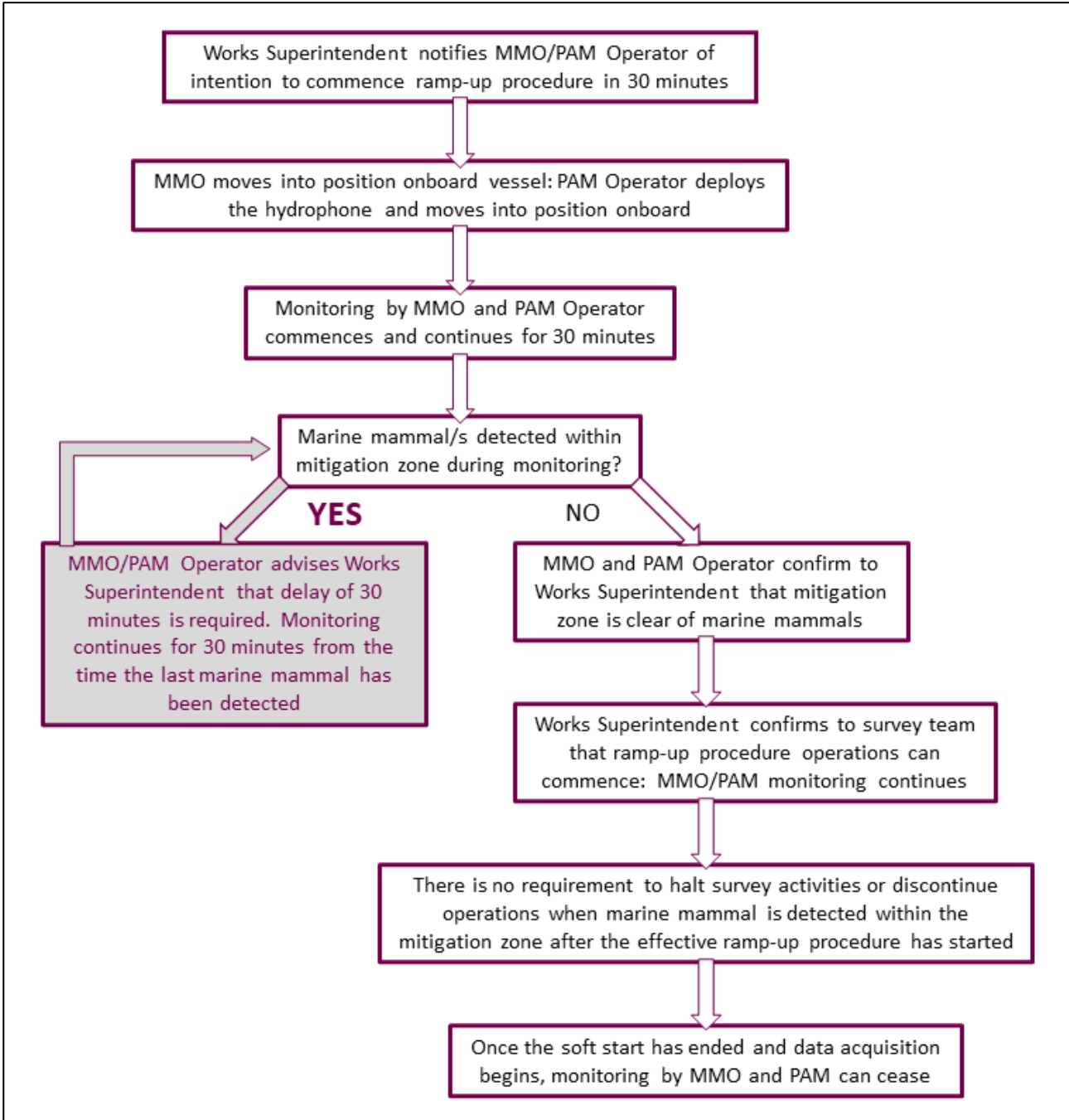


Figure 1-3: Task and communication plan for geophysical survey procedures start-up.

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1.6.4 Field records during geophysical acoustic surveying

Operations report

As per NPWS guidelines (2014) the Operations report will be provided to NPWS on completion of geophysical acoustic survey activities as outlined below and must include use of standard NPWS data forms provided in annex A.2:

- Details of the Client/Contractor involved in the plan/project;
- Details of the Platform/Vessel type(s) participating in the plan/project;
- The survey reference number supplied by the Regulatory Authority or other statutory body;
- Date and location of the plan/project;
- Latitudes, longitudes or grid references for the area of operations;
- Specifications and acoustic characteristics of all sound-producing equipment used;
- For seismic surveys: number and volume of each airgun used and a calculated total volume of the array;
- A daily log of how and when the sound-producing equipment was used including during ramp-up (soft-start) procedures, where relevant;
- Information on any technical problems encountered during pre-start-up procedures, ramp-up (soft-start) procedures or during full scale operation/activity.

Marine Mammal Observer/PAM Report

The Marine Mammal Observer/Passive Acoustic Monitoring Report will include:

- An Executive Summary: a concise text at the beginning of the report highlighting the MMO work undertaken and summarising in turn:
 - All marine mammal detections made during the survey programme;
 - All detections made prior to the commencement of the operation/activity (e.g. before ramp-up);
 - All operational responses to the presence of animals in the area and the associated outcomes;
 - All occurrences of night-time operation/activity, continuation into poor weather and stoppages;
 - Any and all problems arising during implementation of the prescribed mitigation;
 - Any recommendations based on the project and any marine mammal sightings/behaviour encountered during the survey operations which could benefit future projects; and
 - A concluding statement regarding the operational efficacy of the mitigation measures performed.
- Date and location(s) of the plan/project;
- Name, address and qualifications of the MMO(s) on the Platform/Vessel;
- Name of any other Platform/Vessel involved in the operation/activity;
- Latitudes, longitudes or grid references for the area(s) of operations monitored by the MMO;

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- Details of the observation platform used for marine mammal monitoring, including its height above sea level;
- Details of all sound-producing operations/activities undertaken during the period of survey;
- Details of monitoring watches conducted for marine mammals;
- Details of all marine mammal sightings recorded during monitoring watches;
- Details of all marine mammal sightings recorded outside monitoring watches (e.g. incidental observations), including records from additional personnel on board;
- Details of any problems encountered during marine mammal monitoring, start-up procedures, ramp-up (soft-start) procedures or during full scale operation/activity; and
- Details of any instances of non-compliance with NPWS guidelines.

1.7 Roles and responsibilities

1.7.1 Overview

This section sets out the key roles and responsibilities and lines of communications in relation to the MMMP. It identifies each key role involved in the construction phase of the Project and lists responsibilities associated with each role in relation to the MMMP.

1.7.2 Key roles

OWL Project Manager

The Project Manager has responsibility for ensuring that sufficient resources and processes are in place by the contractor and their subcontractors to implement the MMMP. The Project Manager will be responsible for ensuring that contractual obligations are met for contractors in relation to the MMMP, requiring that all construction personnel and contractors assist and support the Environmental Manager for the delivery of the commitments made under this MMMP.

The Project Manager will also ensure that the relevant Package Manager (in this case, the Marine Installation Package Manager) is responsible for:

- Requiring that sufficient resources and processes are in place to deliver/comply with the MMMP;
- Requiring that provision is made for matters relating to the delivery of the MMMP to form part of construction progress meetings and project inductions (e.g. outlining soft start and mitigation procedures as required by the MMMP; see section 1.6);
- Requiring that all construction personnel and contractors assist and support the MMOs and PAM and ADD operators (see below) and the Contractors Environmental Manager in delivering the MMMP and monitoring or auditing compliance with the MMMP;
- Ensuring contractual obligations are met for key contractors and their subcontractors in relation to the MMMP; and
- Reporting to the Project Manager on matters related to the MMMP (see section 1.8).

OWL Environmental Manager and OWL Environmental Clerk of Works

The OWL Environmental Manager is responsible for requiring contractor compliance with the Project consents and environmental legislation. Responsibilities of the OWL Environmental Manager/OWL Environmental Clerk of Works (ECoW) in relation to the MMMP include:

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- Quality assurance of this MMMP;
- Providing advice on compliance with the MMMP;
- Monitoring compliance with the MMMP;
- Reporting on compliance with the MMMP to the Department of Housing, Local Government and Heritage (DHLGH);
- Ensuring that the Contractor is providing appropriate training in relation to construction-related environmental measures and consents compliance; and
- Ensuring that the Contractor is also delivering toolbox talks (e.g. outlining soft start and mitigation procedures as required by the MMMP; see section 1.6) as appropriate.

Contractors

Contractors and their subcontractors are responsible for installing the Project infrastructure in compliance with this MMMP, as required by their contract with the Applicant, and for appropriate liaison with the MMOs and PAM and ADD operators (see below) and the Contractors Environmental Manager.

1.8 Reporting

Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority. The Works Superintendent and MMO/PAM Operator tasked with monitoring the implementation of the mitigation plan and with conducting survey effort for marine mammals in accordance with this guidance, will submit a report to the Regulatory Authority within 30 days of completion of the relevant piling and/or geophysical survey activity. This will include a daily log concerning the testing and operation of all relevant sound-producing equipment/activities, including ADDs and a record of all marine mammal detections.

Reporting will be provided in line with the Operations Report and Marine Mammal Observer Report contents outlined in NPWS (2014) and details are provided in Annexes 1 and 2. The reports also provide information on any problems encountered during the survey activity or mitigation procedure (compliance reporting).

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A.1 NPWS data recording sheets for pile-driving activities

DATA FORM FOR COASTAL/MARINE WORKS - MARINE MAMMAL SIGHTING RECORDS

Options in italics should be circled or underlined as appropriate. Complete 1 record per sheet.

Operation/Activity (please tick)		Dredging	Drilling	Pile Driving	Blasting	Other (specify)
Date (dd/mm/yyyy)	Time (Local)	Time (GMT/UTC)		Sighting Record no.		
How did this sighting occur? (please tick)						
While you were keeping a continuous watch for marine mammals					___	
Spotted incidentally by you or someone else					___	
Other (please specify)					___	
Details:.....						
Platform type & name (e.g. ship, rig, headland)				Observer's name		
Observer's position (Latitude/Longitude or 6-figure Grid reference)				Water depth (metres) (if available)		
Species recorded			Certainty of identification (underline) <i>Definite / probable / possible</i>			
Total number of animals (best estimate)		No. of adults	No. of juveniles	No. of calves		
Maximum number (estimated total)		Minimum number (estimated total)				
Description (include features such as overall size; shape of head; position, shape and size of dorsal fin; colour and patterning; height, direction, shape of blow)				Photograph or video taken Yes / No		
				Direction of travel of animals in relation to platform/vessel (draw arrow)		
						
Behaviour				Direction of travel of animals (compass points or degrees)		
Activity of platform/vessel	Operation/activity under way (when animals first seen)		Closest distance of animals from platform/vessel (metres) (Record even if not operating)			
	<i>Yes / No / Pre-Start watch</i>					

A.2 NPWS data recording sheets for geophysical acoustic survey activities

MARINE MAMMAL RECORDING FORM - COVER PAGE

Regulatory reference number (e.g. DECC no., MMS permit no., OCS lease no., etc.)	Country	Ship/ platform name
Client	Contractor	Survey type <input type="checkbox"/> site <input type="checkbox"/> 4C <input type="checkbox"/> 2D <input type="checkbox"/> VSP <input type="checkbox"/> 3D <input type="checkbox"/> WAZ <input type="checkbox"/> 4D <input type="checkbox"/> other <input type="checkbox"/> OBC
Start date	End date	

Number of source vessels	Type of source (e.g. airguns)	Number of airguns (only if airguns used)	Source volume (cu. in.)
Source depth (metres)	Frequency (Hz)	Intensity (dB re. 1µPa or bar metres)	Shot point interval (seconds)
Method of soft start <input type="checkbox"/> increase number of guns <input type="checkbox"/> increase pressure (where permitted) <input type="checkbox"/> increase frequency (where permitted) <input type="checkbox"/> other			

Visual monitoring equipment used (e.g. binoculars, big eyes, etc.)	Magnification of optical equipment (e.g. binoculars)	Height of eye (metres)	How was distance of animals estimated? <input type="checkbox"/> by eye <input type="checkbox"/> with laser rangefinder <input type="checkbox"/> with rangefinder stick/ calipers <input type="checkbox"/> with reticle binoculars <input type="checkbox"/> by relating to object at known distance <input type="checkbox"/> other
Number of dedicated MMOs	Training of MMOs <input type="checkbox"/> JNCC approved MMO induction course for UK waters <input type="checkbox"/> PSO training course for the Gulf of Mexico <input type="checkbox"/> MMO training course for Irish waters <input type="checkbox"/> other <input type="checkbox"/> none		

Was PAM used? <input type="checkbox"/> yes <input type="checkbox"/> no	Number of PAM operators	
Description of PAM equipment		
Range of PAM hydrophones from airguns (metres)	Bearing of PAM hydrophones from airguns (relative to direction of travel)	Depth of PAM hydrophones (metres)

MARINE MAMMAL RECORDING FORM - SIGHTINGS

Regulatory reference number (e.g. DECC no., MMS permit no., OCS lease no., etc.)	Ship/ platform name	Sighting number (start at 1 for first sighting of survey)	Acoustic detection number (start at 500 for first detection of survey)
Date		Time at start of encounter (UTC, 24hr clock)	Time at end of encounter (UTC, 24hr clock)
Were animals detected visually and/ or acoustically? <input type="checkbox"/> visual <input type="checkbox"/> acoustic <input type="checkbox"/> both	How were the animals first detected? <input type="checkbox"/> visually detected by observer keeping a continuous watch <input type="checkbox"/> visually spotted incidentally by observer or someone else <input type="checkbox"/> acoustically detected by PAM <input type="checkbox"/> both visually and acoustically before operators/ observers informed each other		
Observer's/ operator's name	Position (latitude and longitude)		Water depth (metres)
Species/ species group		Description (include features such as overall size; shape of head; colour and pattern; size, shape and position of dorsal fin; height, direction and shape of blow)	
Bearing to animal (when first seen or heard)	Range to animal (when first seen or heard) (metres)		
Total number	Number of adults (visual sightings only)	Number of calves (visual sightings only)	
Behaviour (visual sightings only)			
Direction of travel (relative to ship) <input type="checkbox"/> towards ship <input type="checkbox"/> away from ship <input type="checkbox"/> parallel to ship in same direction as ship <input type="checkbox"/> travelling in opposite direction to ship		Direction of travel (compass points) <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> NE <input type="checkbox"/> SW <input type="checkbox"/> E <input type="checkbox"/> W <input type="checkbox"/> SE <input type="checkbox"/> NW <input type="checkbox"/> variable	
Airgun (or other source) activity when animals first detected <input type="checkbox"/> full power <input type="checkbox"/> not firing <input type="checkbox"/> soft start <input type="checkbox"/> reduced power (other than soft start)	Airgun (or other source) activity when animals last detected <input type="checkbox"/> full power <input type="checkbox"/> not firing <input type="checkbox"/> soft start <input type="checkbox"/> reduced power (other than soft start)	Closest distance of animals from airguns (or other source) (metres)	Time of closest approach (UTC, 24hr clock)
		If seen during soft start give: First distance Closest distance Last distance during soft start (metres)	

What action was taken? (according to requirements of guidelines/ regulations in country concerned) <ul style="list-style-type: none"> <input type="checkbox"/> none required <input type="checkbox"/> delay start of firing <input type="checkbox"/> shut-down of active source <input type="checkbox"/> power-down of active source <input type="checkbox"/> power-down then shut-down of active source 	Length of power-down and/ or shut-down (if relevant) (length of time until subsequent soft start, in minutes)	Estimated loss of production (if relevant) due to mitigating actions (km)



ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report Appendix 5-5: Marine Megafauna: Vessel Code of Conduct

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Acronyms

Term	Meaning
AIS	Automatic Identification System
CTV	Crew Transfer Vessels
DCMNR	Department of Communications, Marine and Natural Resources
DEHLG	Department of the Environment, Heritage and Local Government
NMFS	National Marine Fisheries Service
NPWS	National Parks and Wildlife Service
Zol	Zone of Influence

Units

Unit	Description
kn	Knot
m	Metre
m/s	Metres per second
nm	Nautical mile

1 MARINE MEGAFUNA: VESSEL CODE OF CONDUCT

1.1 Overview

The waters off the west and southwest coasts of Ireland support the greatest diversity and abundance of marine mammals in Irish waters, with further hotspots off the Celtic Deep (to the south of St George's Channel), Dublin Bay and the Isle of Man (NPWS, 2019; Lysaght and Marnell, 2016; Wall *et al.*, 2013). To date some 24 species of whale and dolphin have been recorded, as well as a number of shark and turtle species and in 1991 the Irish Government declared all Irish waters a whale and dolphin sanctuary. Marine mammals, basking shark *Cetorhinus maximus* and sea turtles are internationally protected species. Marine mammals and sea turtles are listed under current National Legislation - S.I No. 94 of 1997, Natural Habitat Regulations, which prohibits the deliberate disturbance of these species, and marine mammals are also protected under the Fifth Schedule of the Wildlife Act, 1976. In 2022, the basking shark was also afforded legal protection under the Wildlife Act.

Marine mammals which were sighted regularly in site-specific surveys included minke whale *Balaenoptera acutorostrata* and grey seal *Halichoerus grypus*, and the most common cetacean species in the vicinity of the Project was harbour porpoise *Phocoena phocoena*. Common dolphin *Delphinus delphis* and harbour seal *Phoca vitulina* were sighted occasionally during site surveys, and whilst bottlenose dolphin *Tursiops truncatus* were not sighted during these surveys, a review of published datasets indicates that bottlenose dolphin may also be occasionally present in the area. Risso's dolphin *Grampus griseus* are likely to occur in lower numbers.

Basking sharks migrate through the Celtic Sea and Irish Sea during summer months, and during site-specific surveys, two basking sharks were sighted in the vicinity of the Project. Tagging studies have also shown that basking sharks have migrated through this area in previous years (Doherty *et al.*, 2017). Historical records show that three species of marine turtle are likely to regularly occur in Irish waters including leatherback (or 'leathery') turtle, loggerhead turtle *Caretta caretta* and Kemp's Ridley turtle *Lepidochelys kempii* (King and Berrow, 2009). Of these species, the leatherback turtle is distributed around the coast of Ireland, including the Irish Sea, and accounts for 80% of all sea turtle sightings (King and Berrow, 2009).

Full details on the distribution, abundance, conservation status and legal protection of marine megafauna species in the vicinity of the Project are presented in volume 2B, chapter 10: Marine Mammals and Megafauna.

The main risks to marine megafauna from vessels associated with the pre-construction and construction phases of the Project are likely to be from collision with vessels and underwater noise from vessels. This Vessel Code of Conduct is intended to offer best practice to be followed in cases of any interaction between vessels and marine megafauna and has been informed by the following guidance:

- Department of Communications, Marine and Natural Resources (DCMNR) (2005) Marine Notice No 15 of 2005 - Guidelines for Correct Procedures when Encountering Whales and Dolphins in Irish Coastal Waters;
- Department of the Environment, Heritage and Local Government (DEHLG) (2009) Conservation Plan for Cetaceans in Irish waters;
- National Parks and Wildlife Service (NPWS) (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters; and
- National Marine Fisheries Service (NMFS) (2018) Revision to Technical Guidance for Assessing Effects of Anthropogenic Sound on Marine Mammal Hearing. NMFS is a United States Federal Agency.

1.1.1 Collision with vessels

Vessel traffic associated with the Project has the potential to lead to an increase in the number of vessel movements within the Marine Megafauna Study Area. The construction phase includes for 475 vessel round trips during over 15 months. Vessel types include jack-up barges, tug/anchor handlers, cable installation

vessels, scour/cable protection installation vessels, guard vessels, survey vessels, and crew transfer vessels (CTVs).

Baseline levels of vessel traffic in the Marine Megafauna Study Area are likely to be relatively high. A total of 107 vessels were recorded within a 5 nm buffer of the offshore wind farm area and offshore cable corridor over the month of January 2022 with 163 vessels over the month of July 2022 based on AIS data, and comprising of cargo vessels, fishing vessels, service vessels, tankers, recreational vessels and other vessels (see volume 2B, appendix 13-1: Navigation Risk Assessment).

Whilst a broad range of vessel types will be involved in the Project, vessels travelling at higher speeds pose a higher risk because of the potential for a stronger impact, and vessels travelling at 7 m/s (13.6 kn) or faster are those most likely to cause death or serious injury (as per the NMFS (2018) definition) to marine mammals, basking sharks and sea turtles (Laist *et al.*, 2001; Wilson *et al.*, 2007). Vessels involved in the construction phase are likely to be travelling considerably slower than this, or stationary, for significant periods of time and survey vessels are likely to be travelling below 5 kn, as dictated by survey operations. In addition, noise emissions from vessels involved in the construction phase are likely to deter animals from the potential Zone of Influence (Zoi).

The risk of collision with vessels will be reduced by the implementation of a project-specific mitigation protocol (see appendix 5-4: Marine Megafauna Mitigation Plan). As a minimum, the project-specific mitigation protocol will adhere to international best practice, which is likely to include NPWS (2014) guidance.

1.1.2 Noise emissions from vessels

Marine mammals, particularly cetaceans, are capable of generating and detecting sound (Bailey *et al.*, 2010) and are dependent on sound for many aspects of their lives (i.e. prey-identification; predator avoidance; communication and navigation). Increases in anthropogenic noise may consequently lead to a potential effect within the marine environment (Bailey *et al.*, 2010).

Elasmobranchs such as basking shark detect sound using inner ear end organs: they do not have a swim bladder or any other air-filled cavity, therefore they can only sense sound as pressure through their lateral line system (McFarlane *et al.*, 2008). They do use hearing to detect prey, however as a filter-feeding shark, this is less true of basking sharks.

At present, sea turtles are known to sense low frequency sound (Popper *et al.*, 2014), however, little is known about the extent of noise exposure from anthropogenic sources in their natural habitats, or the potential impacts of increased anthropogenic noise exposure on sea turtle biology (Samuel *et al.*, 2005). Sea turtles likely use sound for navigation, locating prey, avoiding predators, and environmental awareness.

There is potential for a small number of harbour porpoise, basking shark and sea turtles to experience a recoverable auditory injury at any one time as a result of vessel noise. Other marine mammal species are not predicted to be affected this way, although vessel noise is expected to increase disturbance to marine mammal and megafauna species.

Avoidance behaviour, displacement or masking of vocalisations is likely to occur only where increased noise from vessel movements are greater than the background ambient noise level. There are existing levels of vessel traffic in the vicinity of the Project, and therefore ambient noise levels are expected to be relatively high.

1.2 Vessel Code of Conduct

The following guidelines are intended to offer best practice to be followed in cases of any interaction between vessels and marine megafauna (such as those described in section 1.1) within Irish waters:

- If marine megafauna are sighted at a distance, continue forward progress maintaining a steady course, ensuring that vessel speed does not exceed 7 kn as soon as the vessel is within 1 km of any marine megafauna. Do not change course to head directly towards them;

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- Do not respond to marine megafauna by sudden or erratic changes of course or speed: slowing down or stopping suddenly can confuse and alarm animals as much as sudden acceleration. Attempt to steer a course parallel to the direction marine megafauna are taking;
- Do not attempt to pursue marine megafauna, drive directly towards them, or encircle them. In the case of dolphins, they may approach vessels and may engage in “bow-riding”. If they choose to bow-ride, maintain a steady speed and course;
- Allow groups to remain together. Avoid deliberately driving through, or between, groups of marine megafauna and avoid close approach to individuals with young. This may risk disrupting mother-offspring bonds and expose inexperienced young to stress and possible boat strikes;
- Do not corral marine megafauna between vessels and always provide an escape route. Maintain a distance of at least 200 m between any other boats in the vicinity and successive boats should follow the same course;
- Maintain a distance of at least 100 m from all animals, and, if possible, alter course in a controlled manner to avoid collision;
- In the vicinity of seal haul-outs, vessels should travel at ‘no wake’ speeds (i.e. less than 5 kn). When seals are disturbed into entering the water they can seriously injure themselves or disturbance may occur before the seal has sufficiently recovered oxygen supplies or energy since last exiting the water. Particular care should be taken during the pupping season when seals pups are present in the vicinity of haul-out sites;
- Possible sources of noise disturbance can be avoided by ensuring speeds are never greater than 7 kn, and by keeping the engine and propeller well-maintained;
- Do not throw rubbish or food near or around marine megafauna and do not attempt to feed them; and
- Do not attempt to enter the water or swim with any marine megafauna.

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