

# ForthWind Demonstration Site, Methil, Fife.

Volume 4: Compliance Plans



April 2022



F O R T H W I N D



## FORTHWIND DEMONSTRATION SITE

### CABLE PLAN

Confidentiality Status: Draft for Consultation

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Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved by
A1	20/04/2022	For Consultation	G Lee	M Murray	M Murray

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## 1. INTRODUCTION

### 1.1. Background

The Forthwind Project is located within the Firth of Forth and comprises offshore wind farms (OWFs) (the wind turbine generators WTGs, their foundations and associated array cabling), to facilitate the export of renewable energy to the national electricity transmission grid. The location of the Forthwind Demonstration Project is shown in Figure 1.1.

The Forthwind Demonstration project comprises:

- A single turbine and sub-structure (foundation and tubular jacket if required) located on National Grid Reference (NGR) 337812, 697333. A 100 m micro-siting allowance from the centre point for the turbine and associated infrastructure is required for the final selection of the turbine location.
- An electricity export cable corridor within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- A metmast and sub-structure (foundation and transition piece) comprising a lattice steel tower located at NGR 337314, 696959. A 100 m micro-siting allowance from the centre point for the metmast and associated infrastructure is required for the final selection of metmast location.
- A communication cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the metmast.

The Project Design Envelope does not reflect the actual footprint of the Proposed Development infrastructure.

### 1.2. Objectives of this Document

This Forthwind Cable Plan (CP) has been prepared in response to a request within the Scoping Opinion and addresses aspects that are required to support the Marine Licence and Section 36 (S36). This is a draft document for consultation and will undergo updates following feedback from Stakeholders, input from the installation contractors and should any parameters of the cable design or installation process change in response to new information.

This Forthwind Cable Plan (CP) confirms the location of the export cable, and their method of burial and protection. It explains how cable routing will be informed by survey work undertaken and identified constraints within the Project area. The CP also confirms the technical specification of the cable to be installed.

All Forthwind personnel and Contractors involved in the Project must comply with this CP.

### 1.3. Scope of the Plan

The CP covers, in line with industry standards and good practice, the following export cables:

- Installation methods;
- Routing;
- Technical specifications and an assessment of the attenuation of electro-magnetic fields;
- A summary of the cable burial risk assessments that have been undertaken to inform burial and protection plans; and
- Methodologies for surveys of the cable through the operational life of the Project.

## 2. DEVELOPMENT OVERVIEW

### 2.1. Development Overview

The proposed Forthwind Demonstration Site is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). Details of the locations of the turbine and metmast are included within Table 2.1, below:

**Table 2.1 - Turbine and Meteorological Mast Location Coordinates - British National Grid**

	<b>Easting</b>	<b>Northing</b>
Turbine	337812	697333
Meteorological Mast	337314	696959

This CP is focused on the construction and operation of the Forthwind Offshore Wind Demonstration Turbine with associated infrastructure including foundation, scour protection, transformers, and electricity export cable (up to Mean High Water Springs, MHWS) connecting the turbines to the onshore substation.

The onshore substation and control building will be located at the Fife Energy Park site.

A Series of geotechnical, geophysical and benthic surveys have been undertaken by Forthwind limited to understand the seabed conditions from the turbine location back to site. The information is being factored into the project design to define the exact cable route from the turbine to the onshore landing point at the Fife Energy Park.

The final location and layout of the cable presented in Figure 3.1 is subject to possible further minor route refinement ('micro-siting') following analysis of the data being collected and as the design moves forward. Micro-siting would be undertaken to route around any newly identified constraints and would not constitute a significant change to this CP.

## 2.2. Timing of Construction Works

An indicative schedule of activities is shown in Table 2.2 below. The main construction phases and likely sequence (with overlap between phases) are as follows:

**Table 2.2 - Forthwind Indicative Schedule of Installation Activities**

<b>Offshore Installation Activity</b>	<b>2024</b>	
	<b>Approximate date</b>	<b>Duration</b>
<b>Turbine</b>		
Installation Vessel Mobilisation	3 <sup>rd</sup> – 10 <sup>th</sup> August	1 week
Installation and Commissioning (Summary)	10 <sup>th</sup> – 28 <sup>th</sup> August	3 weeks
Load out	10 <sup>th</sup> August	0 weeks
Installation start	10 <sup>th</sup> – 13 <sup>th</sup> August	0 weeks
Transit	13 <sup>th</sup> – 14 <sup>th</sup> August	0 weeks
installation (Tower, Nacelle, Blades)	14 <sup>th</sup> – 18 <sup>th</sup> August	1 week
M&E (Full Tower)	18 <sup>th</sup> – 28 <sup>th</sup> August	1 week
WDT & TDT	28 <sup>th</sup> August – 2 <sup>nd</sup> September	1 week
<b>MetMast</b>		
Installation	28 <sup>th</sup> July – 2 <sup>nd</sup> August	1 week

The final construction methods will be determined after detailed design is completed but will remain within the range of construction methods (and associated impacts) presented within the Project Description of the Environmental Impact Assessment Report.

## 3. CABLE ROUTE

### 3.1. Introduction

The route of the export cable from the turbine is based on the geophysical, geotechnical and benthic surveys carried out prior to the submission of the consent application. The cable route is presented (Figure 3.1). A UXO survey will be undertaken prior to installation. The output from the survey will be used to ensure any potential obstructions from the route, such as boulders and fishing debris, can be removed prior to commencement of installation activities.

### 3.2. Location and Layout

#### 3.2.1. Onshore Infrastructure

The offshore electricity export cable will make landfall, via the intertidal zone trench, to an onshore junction pit located on the Fife Energy Park. From the junction pit the 66 kV cables will connect to a small onshore 66 kV/ 33 kV transformer a short distance away. A single 33 kV cable will connect the transformer to a sub station near to the entrance of the Energy Park and from there the electricity will be exported via a dedicated cable to the grid substation at Leven. Figure 3.2 provides details and coordinates of the onshore layout.

The cable route on the Fife Energy Park will be included within the onshore planning application to Fife Council (Local Authority). In addition, a traffic management plan will be agreed with Scottish Enterprise regarding access to the Fife Energy Park to ensure that vehicles operated safely and in a similar manner to the existing vehicular use of the Energy Park. Although, not anticipated, should there be a requirement for a delivery of abnormal loads, consultation and authorisation from BEAR Scotland will be sought prior to undertaking the delivery.

A cable burial risk assessment will be provided by the cable installation contractor and submitted to Marine Scotland and consultees once available.

Figure 3.1 – The Export Cable Corridor Route.

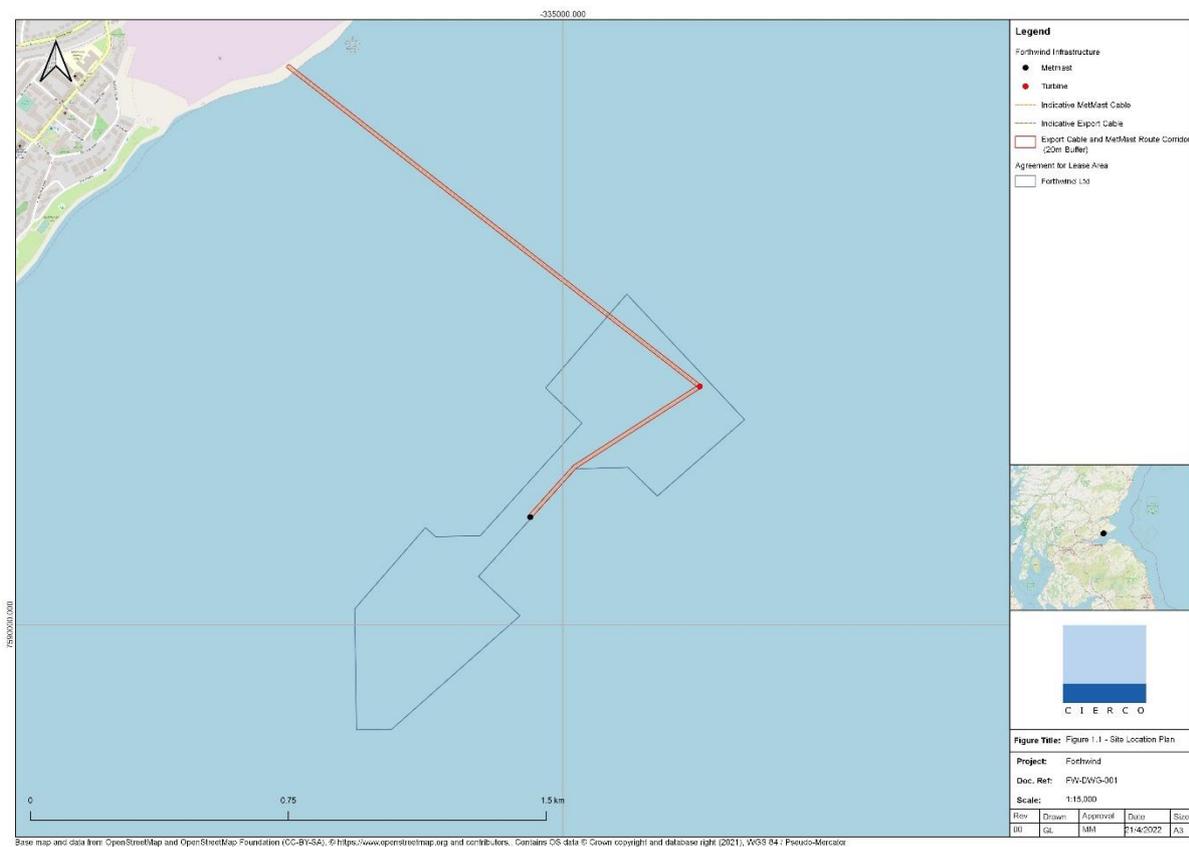
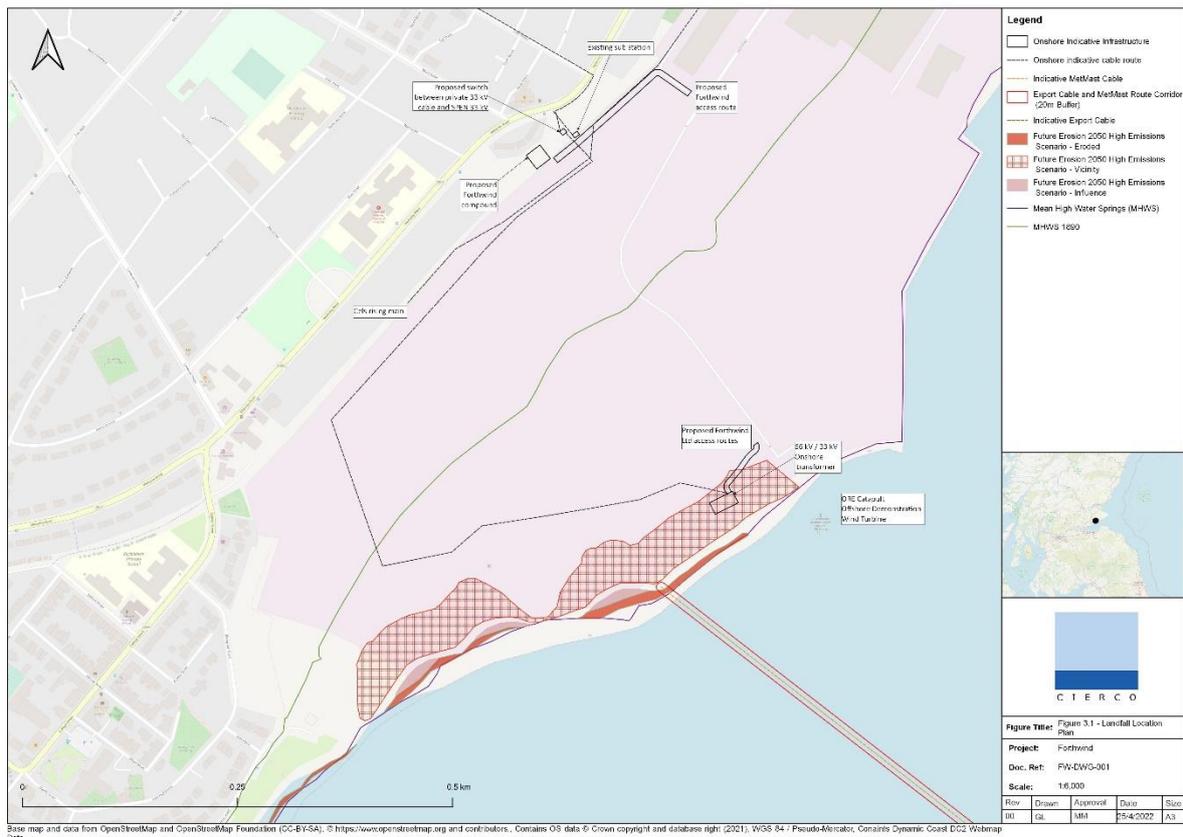


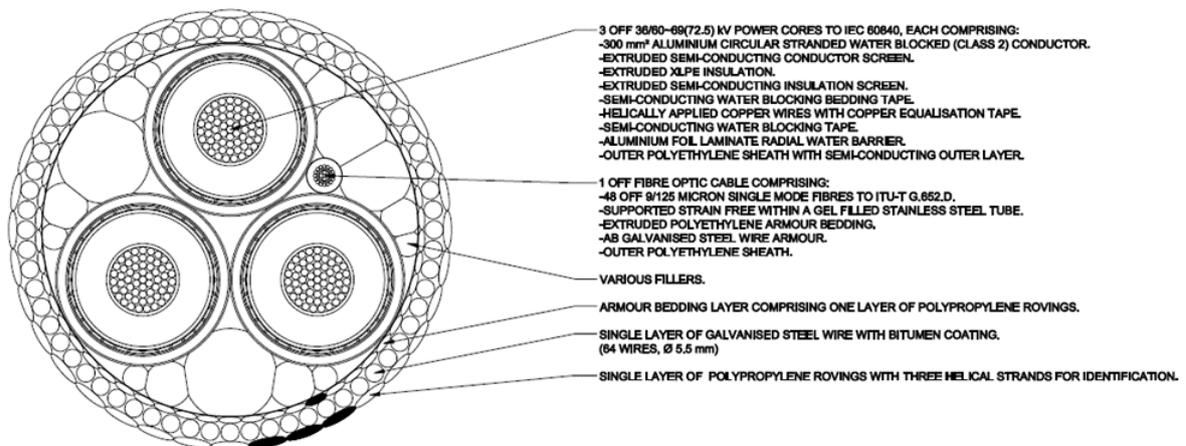
Figure 3.2 – Onshore layout of the Forthwind Project.



#### 4. TECHNICAL SPECIFICATION OF CABLE

The electricity export cable to be used in the Forthwind Project is anticipated to be a 66 kV Subsea Power Cable (design voltage of 36/60~69(72.5) kV in accordance with IEC 60840) armoured submarine power cables of a type typically used to support medium voltage connections in offshore installations. Cable procurement will be undertaken after the relevant project consent and licences are secured. Should there be a difference in cable properties this CP will be updated.

Figure 3.3 – Export cable Cross Section



A cross section of the cable is shown in Figure 3.3 The cable will be designed in accordance with industry standards as set out in the relevant International Electronical Commission (IEC) and DNV-GL guidance. The cable will comprise of three aluminium power cores each with a cross-sectional area of approximately 300 mm<sup>2</sup>. The

aluminium power cores are of flexible design and suitable for installation and use in a sub-sea environment. The cores will be insulated with cross-linked polyethylene (XLPE). For waterproofing each core will be surrounded with a semi conducting water blocking tape suitable for subsea use.

The electricity export cable will be bundled with a fibre optic cable which will provide a communication line to the turbine control system and provide internet connectivity. The cable will be supported in a water repellent gel within a stainless steel tube, protected by inner polyethylene sheath, galvanised steel wire and an outer polyethylene sheath.

For cable armouring/protection, the cable interstices will be filled with appropriate material (e.g. rope or extruded polymeric profile) and the whole cable will be protected by one layer of galvanised steel. Bitumen and polypropylene roving (bundles of fibre wrapped around the cable) are applied over the armour wires for outer protection of the cable.

## 5. CABLE INSTALLATION

### 5.1. General Arrangements

Depending on the ground conditions, the 66 kV electricity export cables will either be buried (to a target depth of 1.5 m) or laid on the seabed and protected by a suitable method (such as concrete matting or rock placement on top of the cables). The cable route trenching, duct installation and cable installation activities are scheduled to be undertaken over a period of 7 days, with the intent to avoid the sensitive overwintering period for the relevant bird species within the intertidal zone.

#### 5.1.1. Onshore works

The onshore works (above MHWS) are being dealt with through the Local Planning Authority (Fife Council) with a separate planning application.

A pull through trench will be dug using excavators from the shallow tide limit through the beach area and the sea defence heap of rock and soils. The precise plan for this arrangement will be finalised on completion of the offshore cable route survey and location of the onshore jointing pit to ensure there is a straight run from onshore to offshore for a simple pull-in.

The trenching option will involve removing the existing coastal defence infrastructure and digging of one open cut trench (up to 3m wide x 1.5m in depth) by an excavator (JCB or similar) from the onshore substation to the MHWS mark, through the intertidal zone and continue offshore to a point below the lowest astronomical tide (LAT).

Up to two PVC cable ducts will be installed in the trench to facilitate the installation of the cables and offer some protection. The trench will then be covered with the material excavated and the coastal defence infrastructure reinstated.

As the intertidal zone is predominantly made ground, it is anticipated that sediment depth will be sufficient to allow the trench in the intertidal zone to be entirely undertaken by an excavator. However, should the sediment depth be insufficient, rock breakers or other mechanical cutting methods may be required to achieve the required design burial depth. Excavation below LAT will be achieved using an excavator mounted on a barge or jack up platform. It is anticipated that the intertidal trench will take around 4 weeks to construct.

Once the preparatory works are complete the cable will be installed to link the onshore site compound transformer to the offshore turbine. The method of installation of the cable through the intertidal zone will be determined in detailed design but consists of two options:

#### 5.1.2. Cable Ducting at Landfall

The shore approach section of the cable route will use a duct to protect electricity export cables, circa 1500 m in length. The duct will be buried wherever possible and externally protected with rock bags or concrete mattress. The duct will be made from High Density Polyethylene (HDPE) material with a design life of 50 years.

Figure 5.1 – Cable Landfall Cross Section

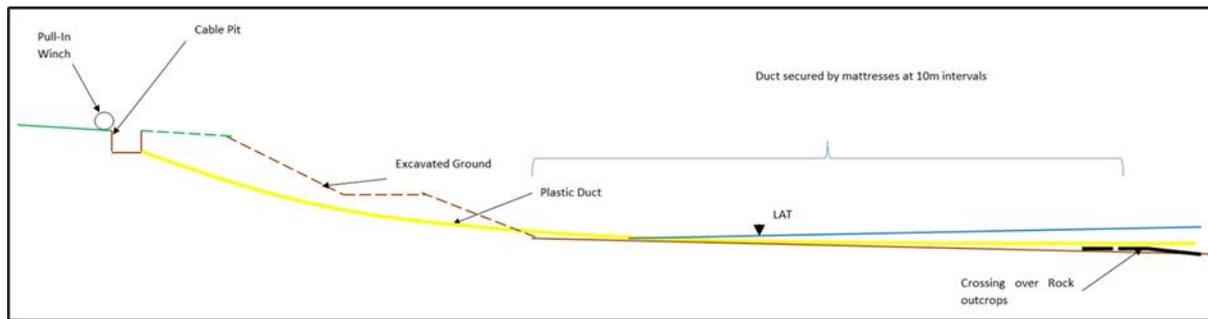
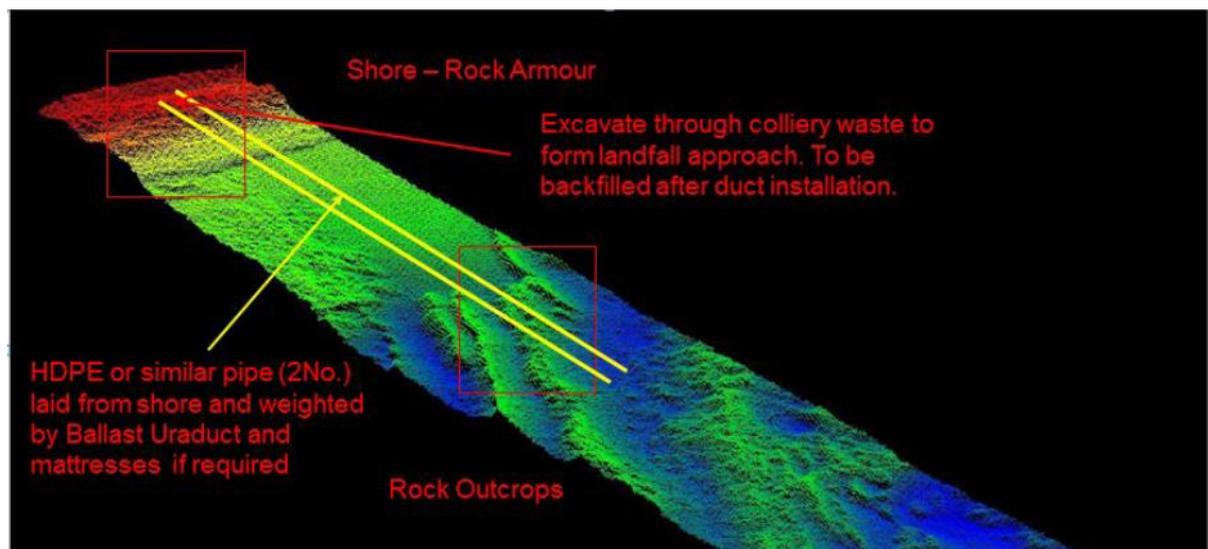


Figure 5.2 – Duct Solution at Cable Landfall Area



#### 5.1.3. Use of concrete mattresses / rock bags

Where cables cannot be buried due to rocky outcrops and where the cables exist the trench at the turbine, it is intended to install external protection to pin and protect the cables. Profiling of these areas will be performed as required using loose rock / gravel to smooth the lay path and maintain the minimum bend radius of the cable. Protection will be applied in the form of 6 m x 2 m x 0.15 m standard density concrete mattresses or alternatively via bulk rock bags. A final determination on cable burying requirements and need for concrete mattressing and/or additional rock bag support / protection can only be made after the cable installation is completed.

To maintain existing and future safe navigation, in areas where external cable protection methods are used, the installation contractor will ensure that the depth in the affected area does not reduce the navigable depth by more than 5% of the surrounding depth as referenced by Chart Datum.

#### 5.1.4. Additional Cable Protection

Where there is a requirement to surface lay the cables over rocky outcrops, additional protection will be added to the cables in the form of a Uraduct. The Uraduct is fitted externally to the cable during lay and gives increase impact and abrasion protection. This system will also be installed at the exist of the J-Tube on the turbine structure to protect the cable.

Figure 5.3 – Image of Trelleburg Uraduct.



#### 5.1.5. Offshore Cable Installation

Following removal of boulders that have the potential to prohibit cable laying and burial, the cable installation will be undertaken by a dedicated cable laying vessel (CLV), supported by a Remotely Operated Vehicle (ROV). The CLV is designed to perform all the activities related to the laying of the electrical cables. (e.g. load at the cable manufacturer, storage in carousels, burial the cable into seabed and others). The CLV will perform a pre-lay survey as part of the cable installations, this will be done after the vessel is loaded and has arrived at site to ensure no changes that will affect the cable installation has occurred since the previous surveys. An ROV will be used to carry out the pre-lay survey. The cable will be installed by utilising a cable plough or trenching tool (either mechanical cutting or jetting depending on the seabed material encountered). The cable will be laid within the trench and then buried to the required 1.5 m minimum depth.

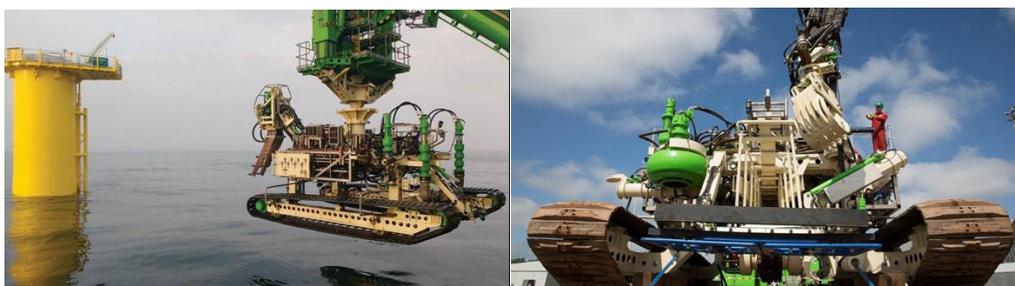
##### 5.1.5.1. Method 1 - Jet Trenching

Jet trenching burial operations is the preferred method for cable burying for the Forthwind project where the soil conditions allow as it offers the lowest risk of cable damage. The jetting burial option is carried out by a tracked trenching machine (a remote operated vehicle), which will bury the cable to a target depth of 1.5 m by use of water jetting. This technique, which is suited for areas where the seabed material can be fluidised (such as areas of sand and clays), also minimises seabed disturbance. It may be the case that cable burial by jet-trenching is considered the most reliable and cost-effective form of cable protection. When seabed conditions are suitable it is also a relatively efficient process of installation.

Jet trenching ROVs use nozzles mounted on jet swords to inject water at high pressure into the soil surrounding the cable which fluidises the seabed in the immediate vicinity allowing the cable to sink under its own weight, before the soil resettles over the top. To maximise post-trenching cable cover and to minimise the disturbance of sediment away from the trench, site specific trencher settings will be derived based on the soil conditions to ensure disturbed sediment is monitored and managed efficiently throughout operations. The jet trenching technique allows the cable route width to be narrowed to about 300-400mm between the jetting swords (as opposed to 3 meters using the ploughing method). In areas where jet-trenching may not be possible due to the presence of stiff sediments a hybrid tool capable of both chain cutting and jet trenching will be used.

Following the first trenching pass depressor depth data will be evaluated to determine whether the target burial depth has been reached. If necessary, a second trenching pass will be completed in either jetting or cutting mode of the hybrid tool to ensure the cable is adequately buried.

Figure 5.4 - A jet trenching ROV (DEME trenching tool CBT1100)



#### 5.1.5.2. Method 2 – Ploughing

An alternative method being considered is the use of a subsea cable plough which is towed on the seabed behind the CLV (or by a ROV as a separate activity). Ploughing involves the CLV surface laying the electrical export cable in a single pass from the exit point to the central collecting turbine. As the cable is laid it is passed through the plough and is buried into the seabed. The plough lifts a wedge of sediment so that the cable can be inserted below, thus minimising seabed disturbance to a very narrow corridor. Burial speed depends on cable type and seabed conditions but for an armoured cable, the burial speed is typically 0.2 km/hr.

*Figure 5.5 - A cable plough*



Post cable lay surveys will be undertaken to ensure that no unintentional berm formation has occurred due to the potential build-up of seabed material caused by the trenching and cable lay operations. Should any unintentional berm be identified, it will be removed using standard marine operations.

#### 5.1.5.3. Cable Burial Alternative

Cable burial is the preferred method of cable protection as it largely protects against bottom-contact fishing activity as well as vessel anchorages. However, burial may not be achievable along the entire length of the cable route due to the sediment depth. If the minimum depth of burial of the cable cannot be achieved, protection of the cables will be provided in the form of rock placement. Rock placement is carried out under highly controlled conditions to place a layer of rock over the cable at the pipeline crossing location, to add a final protection layer. The created rock berm is designed to minimise risk to fishing gear by specific selection of rock size and berm side slopes. Rock placement is considered the best and most effective means for the protection of submarine power cables.

## 5.2. Overview of Cable Installation Process

The following provides an overview to the electricity export and communications cables installation process:

- Pre-lay ROV route inspection – An ROV will be deployed to inspect the cable routes out from the onshore landing point (approx. 500 m offshore) to the base of the wind turbine. The surveys performed will include side scan sonar, multibeam echo-sounder, sub bottom profile and camera surveys. The purpose of the surveys is to determine that the route is clear of surface obstructions which may impede the safe surface lay of the cable out from shore to wind turbines. Any obstructions encountered will be removed, either using ROV with a life line recovery procedure or grappling if necessary.
- Installation at landfall – The cable will be supplied with suitable wire sock cable grips which will facilitate the pull-in operations to shore and for the turbine. The cable grip will be connected to messenger wires at the beach (secured in position by an anchor plate at the junction pit) and at each turbine for pull-in operations. After securing of the cable end onshore, the cable is then paid out to the seabed from the cable lay vessel.

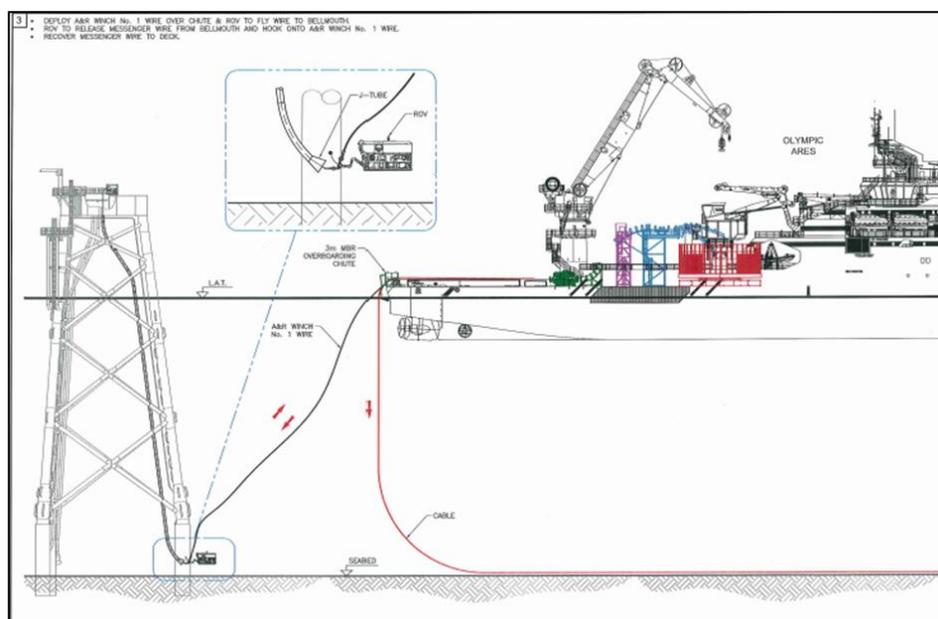
Figure 5.6 - Wire Sock Cable Grip Arrangement for the Cable Pull



At the initial installation and shore pull stage of the operation, the vessel will set-up as close to shore as feasibly, ideally during highest tide to maximise the working depth. The messenger wire (attached to a winch on the Energy Park) will be towed out to the cable lay vessel by a RIB and then connected to the first end of the cable. The cable will be over-boarded over the vessel chute and pulled into the beach using floats or roller stands as required. A secondary vessel may also assist in supporting the cable in the shallower water depths and feeding the cable into the shore approach section. The cable will be pulled through the installed duct to the beach area and secured in the jointing pit allowing the lay vessel to move off and commence lay of the remainder of the cable to the turbine.

- Main Cable Lay – the cable will be laid into a pre-cut trench along the lay route. The cable will be monitored to ensure the appropriate amount of tension and slack as the topography requires. Where required the deck team will install additional protection to the cable at the predetermined locations due to the seabed profile.
- Landing the Cable to the wind turbine – a J-tube is located on the turbine foundation structure to guide the cable up through the structure to the wind turbine. Prior to the cable pull through the J tube all necessary equipment is installed and prepared on the Wind Turbine Structure platform and the J-Tube and area around the entry point surveyed to ensure it is clear from debris. A messenger wire is then passed from the turbine structure through the J tube to the installation vessel. The messenger wire is attached to the main pull wire attached to the cable. The cable will then be pulled into the switchgear and terminated and tested.

Figure 5.7 - Installation of export cable to the Wind Turbine



- Met Mast Communications cable – a smaller communications cable will be installed between the turbine and met-mast. The arrangement for connection at the turbine and at the met mast will be a similar J-tube arrangement and the burial methods between the turbine and the met mast will be the same; again aiming for a similar 1.5m burial depth.
- Post installation inspection and burial – on completion of each cable segment, it will be necessary to carry out a post lay inspection and burial (PLIB) operation along the burial cable route with the aim of determining that the cable has been buried correctly. This inspection will most likely be carried out by a

ROV, which will carry out a jetting pass over the route of the cable after which a further inspection pass will be carried out.

#### 5.2.1. *Cable Burial Risk Assessment*

A Cable Burial Risk Assessment (CBRA) is a risk based assessment that helps determine the optimum depth for cable burial so that threats to the cable and other marine users (such as fishing gear or boat anchorages) are avoided. As part of the design process, a CBRA will be carried out by a suitable qualified and experienced technical consultant prior to installation to ensure that CBRA is undertaken to appropriate standards. This cable plan will be updated based on the outcome of the CBRA and consulted with key stakeholders prior to installation operations.

## 6. CABLE OPERATION AND MAINTENANCE

Once the electricity export cable has been installed, an assessment of the potential future risk of cable exposure will be completed. Based on the outcome of the post installation cable risk assessment, visual inspections of the integrity of the subsea cables and their burial condition will be undertaken at an appropriate frequency by the Forthwind appointed Operations and Maintenance contractor. The subsea cables will be inspected using a remotely operated underwater vehicle (ROV) from the J-tube of the turbine structure along the route of the cable back to the duct entry point close to shore.

In the event of cable failure or exposure, maintenance and rectification work will be undertaken to ensure that the burial condition of the cable is maintained within the cable burial risk assessment parameters. Forthwind will re-bury the cable or if this is not feasible apply additional cable protection material. Forthwind will provide notification to MS-Lot in the instances of cable failure or exposure prior to undertaking any rectification work.



## **FORTHWIND OFFSHORE DEMONSTRATION SITE**

### **Construction Environmental Management Plan**

Confidentiality Status: Draft for Consultation

<b>SIGNATURES</b>					
<b>Rev</b>	<b>Date</b>	<b>Purpose of Issue</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved</b>
<b>A1</b>	26/04/2022	For Consultation	M Murray	G Lee	M Murray

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## 1. PURPOSE AND OBJECTIVES OF THIS DOCUMENT

This Forthwind Construction Environmental Management Plan (CEMP) has been prepared in response to a request within the Scoping Opinion and addresses aspects that are required to support the Marine Licence and Section 36 (S36). This is a draft document for consultation and will undergo updates following feedback from Stakeholders, input from the installation contractors and should any parameters of the project design or installation process change in response to new information.

The overall objective of this document is to set out the Forthwind projects approach to environmental management during the construction of the Forthwind project. This document sets out the roles and responsibilities of key project personnel and details of mitigation and management measures to avoid possible environmental impacts in the deployment area during construction.

The CEMP is intended to inform project personnel and project contractors. The Forthwind project will require compliance with the approved CEMP (and all other relevant, approved Consent Plans) by Contractors through condition of contract and by an appropriate auditing process. Similarly, Forthwind will require compliance with any relevant limits and commitments set out in the S36 and Marine Licence Application, the Environmental Impact Assessment Report (EIAR).

Compliance with the CEMP will be monitored by the project Environmental Clerk of Works (ECoW), the Forthwind Project Manager (PM), and the Marine Scotland Licencing and Operations Team (MS-LOT).

### 1.1. Scope of the CEMP

This CEMP has been drafted in line with industry standards and good practice and covers the following:

- The roles and responsibilities of key Project personnel for environmental management.
- Mechanisms for reporting to the MS-LOT and stakeholders on environmental issues and compliance.
- Mitigation measures to prevent adverse impacts to the environment.
- Chemical usage measures.
- Provisions for the prevention the introduction of marine non-native invasive species.
- The procedure for dealing with dropped objects.
- The procedures for dealing with Unexploded Ordnance (UXO).
- Pollution prevention and contingency measures; and
- Waste management measures.

It is intended that following the issuing of a permit and licence by Marine Scotland further consultation with stakeholders will be undertaken. This CEMP will be updated, after the permits have been issued and prior to construction activities of the Forthwind project commences, to include a review of base assumptions, and will consider the feedback from consultation.

## 2. PROJECT OVERVIEW

The proposed Forthwind Demonstration Site is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). The Proposed Development Footprint Envelope consists of the following:

- A single turbine and sub-structure (foundation and tubular jacket) located at British National Grid reference (BNG) 337812, 697333. A 100 m micro-siting allowance from the centre point for the turbine and associated infrastructure is required for the final selection of turbine location.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- A metmast and sub-structure comprising a lattice steel tower located at BNG 337314, 696959. A 100 m micro-siting allowance from the centre point for the metmast and associated infrastructure is required for the final selection of metmast location.
- A communications cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the metmast.

Details of the locations of the turbine and metmast are included within Table 2.1, below:

**Table 2.1- Turbine and Meteorological Mast Location Coordinates - British National Grid**

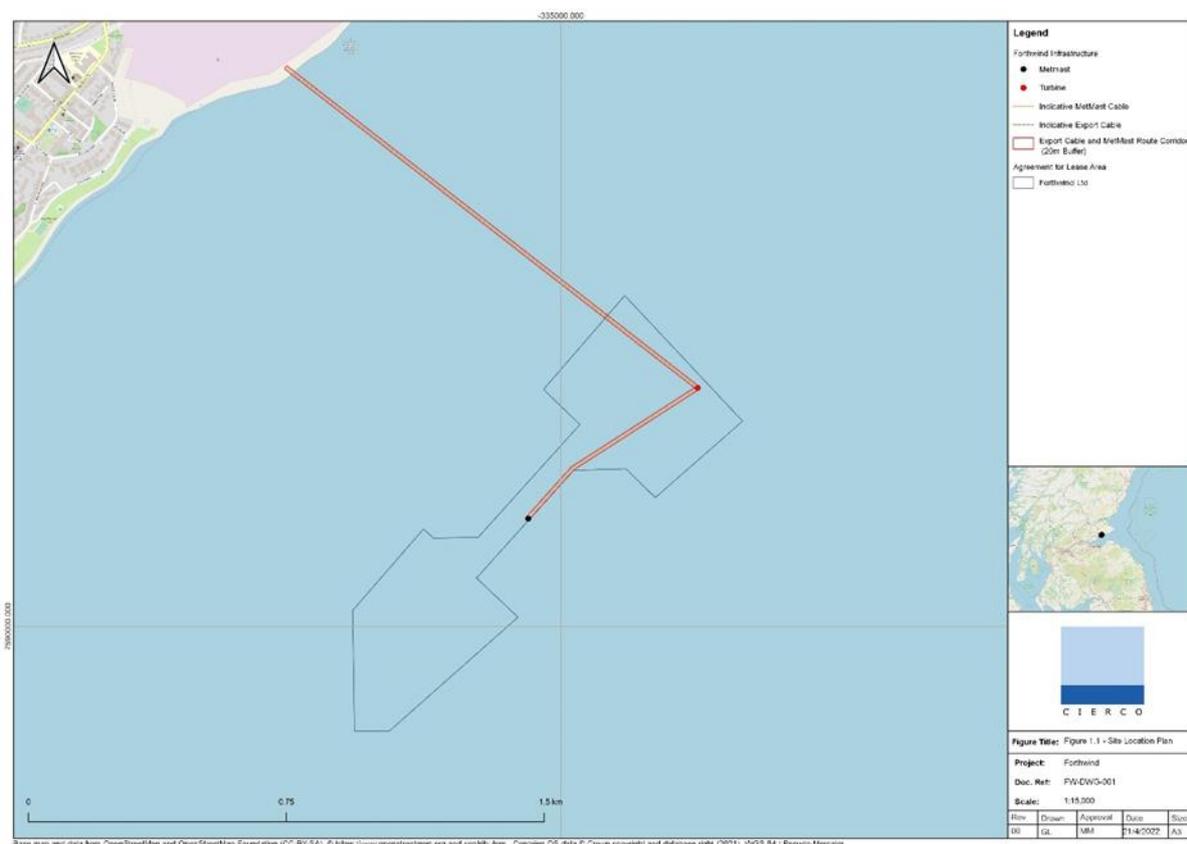
	Easting	Northing
Turbine	337812	697333
Meteorological Mast	337314	696959

This CEMP is focused on the construction and operation of the Forthwind Offshore Wind Demonstration Turbine with associated infrastructure. A series of geotechnical, geophysical and benthic surveys have been undertaken by Forthwind limited to understand the seabed conditions from the turbine location back to site. The information is being factored into the project design to define the exact cable route from the turbine to the onshore landing point at the Fife Energy Park.

The final location and layout of the cable presented in Figure 1.1 is subject to possible further minor route refinement ('micro-siting') following analysis of the data being collected and as the design moves forward. Micro-siting would be undertaken to route around any newly identified constraints and would not constitute a significant change to this CEMP.

It is anticipated that offshore construction will take approximately three months, across a period of approximately six months. After the construction period the turbine will undergo testing and commissioning before becoming operational. The Proposed Development will be operational for 25 years from final commissioning.

**Figure 1.1 - The Forthwind Project location**



## 2.1. Development Programme Milestones

The construction works required for the Proposed Development will take approximately three months, across a period of approximately six months. The current understanding of the programme is provided in Chapter 3, section 3.6 of the Forthwind EIAR. Further detail of the timings and durations of the construction programme

will be provided following the issuance of the Section 36 and Marine Licence by Marine Scotland and the appointment of the EPC contractor.

### 3. FORTHWIND ENVIRONMENTAL MANAGEMENT ARRANGEMENTS

Cierco and Forthwind recognise that the protection of the health and safety of our stakeholders and our environment are of prime importance in delivering our business objectives. The health and safety of our employees and others affected by our activities, and the environment that we operate in, is assured through the effective design, construction, maintenance and operation of our technology and developments.

Cierco, who have 100% ownership of Forthwind Ltd, operate a management system based on planning and implementing effective controls, measuring performance and continuous learning and improvement driven by a committed management team. All operations are guided by the following approved Health, Safety and Environment (HSE) Policy:

Figure 3.1 Cierco HSE Policy

### Cierco Health, Safety and Environment (HSE) Policy

Cierco's goal is to facilitate the introduction of new, innovative, sustainable, carbon neutral marine technology into the global commercial market. We recognise that the protection of the health and safety of our stakeholders and our environment are of prime importance in delivering this goal. Our HSE management system will reflect the nature and size of our company operations and our aim to achieve incident free operations by ENACTing our HSE Principles.

Cierco HSE Principles (ENACT)	
<b>Enhance</b>	<ul style="list-style-type: none"> <li>We will establish a fit for purpose integrated HSE management system.</li> <li>We will monitor and seek continual improvement in our HSE performance.</li> </ul>
<b>Nurture</b>	<ul style="list-style-type: none"> <li>We are committed to the protection of the environment and will use resources efficiently.</li> <li>We will provide a healthy, safe and secure workplace environment for our workforce and visitors.</li> <li>We will identify and assess the HSE and corporate hazards and manage the associated risks.</li> </ul>
<b>Accountable</b>	<ul style="list-style-type: none"> <li>The Cierco Managing Director is accountable for the effectiveness of the HSE Management System; ensuring adequate resources are provided to manage HSE as an integral part of our business.</li> <li>We require an active commitment to, and accountability for, HSE from all of our workforce, including contractors, in their daily work activities.</li> </ul>
<b>Comply</b>	<ul style="list-style-type: none"> <li>We will comply with all relevant HSE legal and other obligations.</li> <li>We will provide appropriate HSE information, instruction and training for our staff to foster safety standards and protection of the environment.</li> </ul>
<b>Tell</b>	<ul style="list-style-type: none"> <li>We will consult and communicate with our employees and stakeholders on HSE issues.</li> <li>We will sustain a positive health and safety culture through empowering employees and promoting active participation and cooperation on HSE issues</li> </ul>

This policy will be reviewed annually by the Cierco board to ensure we meet our expectations.



**Mikael Jakobsson**  
Cierco Managing Director

January 2021



C I E R C O

#### 3.1. CEMP Roles and Responsibilities

All Forthwind staff and contractors have a responsibility to comply with the requirements of CEMP, however the key roles relevant to the delivery of the CEMP are presented in Figure 3.2 below:

Figure 3.2 - CEMP Key Roles



### 3.1.1. Forthwind Project Director

The Forthwind Project Directors reports to the Forthwind Project Board and has the following responsibilities:

- Ensure that sufficient resources and processes are available and in place to deliver the successful implementation of this CEMP.
- Ensure that provision is made for environmental management issues to form part of project progress meetings and site staff inductions.
- Ensure contractual obligations are established for Contractors in relation to this CEMP.

### 3.1.2. Forthwind Project Manager

The Forthwind Project Manager reports to the Forthwind Project Director and is responsible for providing support, advice and guidance on all aspects of Health, Safety & Environmental management on the Project. The Project Manager will retain overall responsibility for ensuring that this PEMP is implemented and abided by Forthwind staff and contractors. The Project Manager has specific responsibility for:

- Coordinating the development, monitoring and implementation of Forthwind HSE management arrangements (including this CEMP).
- Providing HSE support, advice and guidance to the Forthwind Project team.
- Encouraging the Forthwind Project team to facilitate improvements in HSE performance.
- Ensuring personnel engaged on the Project are aware of all HSE obligations detailed within the Forthwind HSE Management Plans
- Ensuring that all personnel and contractors assist and support the ECoW where required.
- Ensuring that any corrective actions arising from environmental audits are addressed.
- Ensuring Contractor and Subcontractor non-compliance is reported and addressed.
- Act as the primary contact for MS-LOT, statutory bodies and stakeholders.
- Where necessary, managing the process of obtaining new consents or monitoring consent applications made by Contractors / Principal Contractor.
- Reviewing Contractor documentation (e.g. method statements and risk assessments, EMPs) to ensure compliance with this CEMP.
- Managing the Forthwind ECoW, FLO and retained Archaeological Consultant.

### 3.1.3. Forthwind Environmental Clerk of Works

The Forthwind Environmental Clerk of Works (ECoW) will have responsibility for the following:

- Ensure that the CEMP is prepared and implemented in compliance with consent conditions and other relevant Forthwind Consent Plans.
- Monitor and report on compliance with the CEMP to the MS-LOT as part of their regular compliance reporting, as detailed in the CEMP. Maintaining and updating the CEMP document, in consultation with and as required by the relevant authorities.
- Requiring that all environmental monitoring or specialist studies required under the CEMP are undertaken at the appropriate time.

- Reviewing relevant Contractor documents from a compliance perspective.
- Providing advice to the Forthwind project on compliance with consents conditions.
- Providing support in the induction of Forthwind staff and contractor personnel on site / works environmental policy and procedures.
- Being primary contact in the Forthwind team for any environmental incident response.
- In the event of the discovery of unexpected, unusual or extremely fragile and delicate objects and deposits, the ECoW is responsible for notifying the Retained Archaeologist immediately.
- Reviewing the monitoring reports and submitting the reports to Marine Scotland; and
- Liaising with the relevant consultees on matters related to this CEMP.

#### 3.1.4. *Forthwind Fisheries Liaison Officer*

The Forthwind FLO will be responsible for the following:

- Maintain an effective communications channel with the fishing industry, any contractors or sub-contractors, other developers and other users of the sea.
- Provide information relating to the safe operation of fishing activity on the site of the Proposed Development.
- Develop and maintain a strong positive working relationship with the local fishing industry.
- Understand the interactions likely to occur between the local fishing industry and the Forthwind project, and any potential impacts on the fishing industry during construction.
- Ensure that information is made available and circulated in a timely manner to minimise interference with fishing operations and other users of the sea.
- Maintain the fisheries stakeholder database that contains information on fishing vessel operations (e.g. vessel name, registration and port base, skipper and crew details etc.) within and around the Forthwind site.
- Prepare and distribute the required information and notices of all Forthwind activities which could affect fishing stakeholders.
- Instruct contractors on the fishing activities in the areas of work and provide details on the fishing activities and gear types that may be present, any relevant fishermen's sensitivities and channels and contact details for communicating with the fishing vessels at sea.
- Communicate details of any dropped objects to the fishing industry; and
- Communicate details of exposed cables and any other safety hazards to the fishing industry.

During offshore operations, the Forthwind FLO will also be stationed on a works/guard vessel to communicate directly with fishermen and request them to keep works locations free from gear to prevent risk to the fishermen or the works.

#### 3.1.5. *Retained Archaeologist*

The Retained Archaeologist will oversee archaeological mitigation and be the initial point of contact for the ECoW. The Retained Archaeologist will report to the Forthwind Project Manager and will be responsible for:

- Maintaining, reviewing and updating the WSI & PAD, as required.
- Advising Forthwind which elements warrant archaeological involvement.
- Advising Forthwind on the necessary interaction with third parties with archaeological interests.
- In the event of the discovery of items that may be eligible for legal protection, the Retained Archaeologist will notify the relevant legal authority as soon as possible.
- Advising Forthwind on the implementation of generic archaeological requirements applicable to all construction and operational activities.
- Advising Forthwind on Method Statements for archaeological investigations should it be required.
- Preparing detailed Method Statements for all archaeological activities should it be required.

#### 3.1.6. *Key Contractors and Subcontractors*

Environmental monitoring will be undertaken throughout all phases of the Proposed Development. Whilst key contractors and subcontractors undertaking construction of the Proposed Development, and contractors with Operation and Maintenance (O&M) responsibilities, will not be involved in undertaking environmental

monitoring, conditions of their contracts will require that they facilitate Forthwind's compliance with the conditions of the Section 36 and Marine Licence.

### **3.2. Forthwind Staff and Contractor Competence, Training and Awareness**

#### *3.2.1. Project Staff Competence*

In compliance with the Cierco HSE policy, all Forthwind Project personnel shall have the required skills, education, training, and experience to perform their tasks.

#### *3.2.2. Contractor Competence*

Forthwind will utilise an outsourcing model, where contracts will be awarded for the design and installation of the wind turbine. To support this model adherence to the procurement process is vital to ensure the correct suppliers are selected to ensure QHSE requirements are met, the level of supplier management is appropriate, programme schedules are adhered to and a total cost approach is adopted. Forthwind is committed to creating partnerships that will develop the supply chain in order to meet the successful delivery of the project. Contractors are required to complete prequalification HSE questionnaires and have to demonstrate that they operate an Environmental Management System (EMS) appropriate to their scope of work as part of the tendering process. Appointed contractors are subject to ongoing performance review depending on the duration of their scope of work and must maintain the status of their EMS for the duration of their works.

#### *3.2.3. Training and Awareness*

Forthwind is committed to assisting all staff to acquire and maintain the QHSE skills and knowledge to allow them to perform to the best of their ability at work. We recognise the importance of maintaining a committed and competent workforce and will, where possible, encourage the development of QHSE skills within Cierco and Forthwind, and encourage staff to achieve their full potential. Forthwind will:

- Provide induction training for all new employees.
- Provide appropriate appraisal methods for identifying individual staff and companywide training needs.
- Provide appropriate training to enable all employees meet the required job performance standards to undertake work in a safe manner.
- Ensure that adequate instruction is provided for health and safety purposes; and
- Ensure that regular evaluation and review of all training activities is undertaken to check that the necessary standards have been achieved and to identify potential improvements to the arrangements.

A QHSE training matrix has been developed and staff are provided with training they require to undertake their duties. Training and awareness specific to this CEMP will be delivered to Forthwind personnel and contractors. This will be delivered through a site induction process. Forthwind will ensure that a dedicated section is included within wider Project induction material and regular weekly toolbox talks to cover environment and consents issues, including but not limited to:

- Identification of specific environmental risks associated with the work to be undertaken on site.
- Key responsibilities for compliance with the CEMP and briefings on issues such as the consents, biosecurity management, marine mammal protection and management and storage of chemicals and hydrocarbons.
- The role of the ECoW and their contact details.
- Waste Management arrangements.
- Spill response.
- Familiarisation with the Environmental Incident Reporting dropped objects and WSI/PAD procedures; and
- Awareness of how to address oil and chemical spills and re-familiarisation with the appropriate contractor Marine Pollution Control Plan (MPCP).

## **4. OFFSHORE CONSTRUCTION METHOD STATEMENT (OFFCMS)**

This offshore construction method statement (OffCMS) for the Forthwind wind turbine and cables is consistent with the description of the installation process contained within Forthwind Environment Statement and all

installation activities will be compliant with the Construction (Design and Management) Regulations 2015 (CDM 2015).

#### **4.1. Assembly Plan**

The turbine OEM will be responsible for assembling and delivering the turbine and structures for the Forthwind project.

##### *4.1.1. Turbine*

As the turbine to be installed at Methil is a demonstration turbine, it will be of a bespoke design and manufacture (i.e. not production line produced). The completed component will be readied for assembly and then transported by road/rail/sea to a central assembly facility (most likely in the UK or mainland Europe) that has direct access to waterways suitable for onward transportation to the installation site.

As far as is practicable the components of the turbine will be delivered to the assembly site as pre-tested modules. The assembly of the turbines will be carried out in a predetermined sequential manner by a suitably qualified and experienced (SQEP'ed) contractor under the direction of Forthwind. Prior to shipping, systems will be commissioned and tested as much as practical, to de-risk offshore activities and minimise commissioning time.

##### *4.1.2. Foundation and Transition Piece*

The fabrication of the support structure for the Forthwind project will be subcontracted by Forthwind to a SQEP'ed contractor to meet the approved design specification. The contract will include the fabrication, testing and inspection of the main structure, access systems (including the boat landing system), all secondary steel, cable channels and necessary ancillary items (such as the hoist mechanism, etc). Once fabricated and painted, the completed structure will be transported to site.

##### *4.1.3. Met-Mast*

The fabrication of the met mast for the Forthwind project will be subcontracted by Forthwind to a SQEP'ed contractor to meet the approved design specification. The contract will include the fabrication, testing and inspection of the main structure, access systems (including the boat landing system), all secondary steel, cable channels and necessary ancillary items. Once fabricated and painted, the completed structure will be transported to site.

#### **4.2. Overview of the Installation Process**

The offshore installation process for the project will be performed in two phases. The first phase involves the installation of the foundation piles for the turbine and met-mast and associated cabling over a 4 week period; whilst the second stage is the installation of the structures, turbine, met mast and export cables will take place over an 11 week period, after which the turbine will undergo testing and commissioning before becoming operational. The installation process to be followed can be summarised as:

- 1) Seabed preparation will be undertaken prior to piling operations commencing and will include clearance of debris or levelling of the piling area.
- 2) A pile socket will be drilled into the seabed from the jack up barge (JUB) for each foundation piece using a single drill bit.
- 3) For each foundation a steel pile is lifted into place by the lifting vessel, inserted into the pile sleeve.
- 4) The cement grout, required for each pile following installation, will be injected from a JUB through tubes in the legs of the tubular jacket substructure into the space between each pile pin and sleeve.
- 5) Following a period of around 15 weeks to allow the grout in the foundations to "cure", the structure is then installed, with the transition piece placed into the seabed piles, followed closely by the tower section and finally the nacelle and blades are installed.

#### **4.3. OFFCMS Roles and Responsibilities**

A project board for the Forthwind Project will be established following financial close for the project and will be based in Scotland. The Forthwind Project Board will be responsible for the scope definition and the Forthwind

Project Manager is responsible for delivering the scope within schedule and budget in a safe and efficient manner in accordance with the relevant quality standards (as agreed with the Project Board).

The construction work will be compliant with the requirements of the Construction (Design and Management) Regulations 2015 (CDM 2015). A Forthwind Project HSE Plan will be prepared to outline the process procedures and responsibilities employed within the Forthwind project for the effective management and delivery of the Offshore Wind Demonstration project.

The following provides an interim overview of the roles and responsibilities of the Forthwind Project team. This organisation chart will be reviewed and updated prior to construction activities being undertaken.

Figure 4.1- The Forthwind Project Delivery Organisation

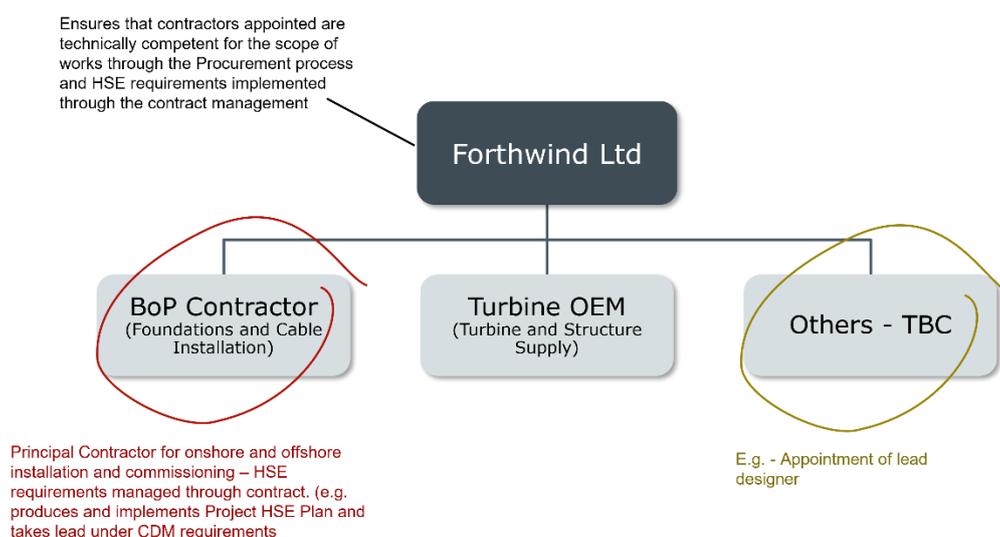


Table 41 - The Forthwind CDM Responsibilities

CDM Duty	DUTY HOLDER
Client	Forthwind Ltd
Principal Designer	Design contractor (to be appointed)
Principal Contractor	Onshore – EPC contractor (to be appointed) Offshore - Balance of Plant contractor (to be appointed)

4.3.1. Delivery of operational Turbine and Structure.

This Prime contract consists of the design, fabrication and supply of the offshore wind turbine, including the met-mast and support structures.

4.3.2. Delivery of equipment and services

The scope of this work could be undertaken by a single prime contractor (Balance of Plant) or via a few “smaller” Engineering, Procurement and Construction (EPC) contracts. The scope of service consists of the design and supply of the pile foundations, transport and installation of the turbines and support structures, supply and installation of all associated onshore and offshore infrastructure (including cables) and provision of management services (Including management of design interface, onsite QHSE systems during installation and commissioning and the provision of the Principal Designer and Principal Contractor CDM functions).

As client Forthwind will retain overall responsibility for HSE performance, including offshore and onshore installation operations and key support functions (safety, environmental performance, and compliance).

## 5. DROPPED OBJECTS

In the course of operations objects may be dropped in the marine environment. Forthwind is obliged to report such losses immediately to the Maritime and Coastguard Agency (MCA) and other organisations including MS-LOT within 24 hours. Forthwind has developed a procedure, "Reporting of Offshore Dropped Objects" (FW1-HSE.01-PRO-02) that identifies the measures to be put in place to manage and report dropped objects into the sea during the construction or operational phase of the Forthwind project, including recovery where possible and the recording of losses. It has been designed to meet with industry best practice and meet legislative requirements. This procedure also provides the route for communicating deposits made under circumstances of Force Majeure.

## 6. WASTE MANAGEMENT PLAN

Forthwind will be responsible for requiring that waste management measures are implemented effectively through the implementation and monitoring of the requirements of the Forthwind Project HSE Plan and contractual requirements for the implementation contractors and subcontractors.

All waste materials shall be disposed of properly and all contractors are responsible for taking the necessary steps to prevent pollution and minimize the generation of waste. Each contractor will maintain a waste management plan, that shall include the following as a minimum:

- Proper identification of each individual waste stream.
- Segregation of individual waste streams (e.g. special, controlled, industrial etc.).
- Proper labelling of contents, markings, manifesting, storage, and shipping of each waste stream.
- Re-use and recycling initiatives.
- Disposal at licensed waste management sites.
- Records of certificates, waste transfer notes, consignment notes, and waste disposal licenses shall be retained for at least 3 years; and
- Contractors will maintain a list of licensed waste disposal contractors who may be used.

All offshore construction vessels will be required to:

- Comply with International Maritime Organisation (IMO) regulations and will follow The International Convention for the Prevention of Pollution from Ships (MARPOL) requirements regarding discharge of waste, sewage and oil or oily mixtures.
- Manage waste in compliance with the individual vessel's Waste Management Plan.
- Dispose all controlled waste at port via a registered waste carrier or broker under the Waste Management Licensing (Scotland) Regulations 2011.

## 7. MARINE POLLUTION CONTROL PLAN

The CEMP and this Marine Pollution Control Plan are live documents and will be updated over the lifecycle of the Project. Procedures will be reviewed as part of the overall Project quality plan and in any event reviewed following on from any spill or pollution incident to ascertain any lessons learned.

### 7.1. Pollution Sources and Risk Management

As mentioned previously Forthwind will operate an outsourcing model, where contracts will be awarded for the installation of the wind turbine. The appointed contractor will be required to create an inventory register of the types of pollutants (hydrocarbon and chemical) that will be used during the construction of the project (types, sources and quantities) with corresponding procedures for their management and control (including preventative measures and spill incidence response). Alongside the register, the appointed contractor will also be required to provide an appropriate detailed risk assessment identifying potential pollution events and associated prevention plans and spill response. The procedure, inventory, risk assessments and response plans will be presented in the updated CEMP for approval by MS-LOT.

The construction and installation process will be managed to minimise pollution risks and even through the installation timelines are relatively short for an offshore wind installation and the inventory on board will be

relatively small, the pollution risks and control measures will be regularly reviewed and updated through appropriate planning, including:

- Regular programme and project management meetings.
- Pre-commencement meeting.
- Pollution control being a regular feature on tool-box talks.
- Ensuring that vessel operators regularly review their Marine Pollution Control Plans; and
- Regular audit and inspection by the Forthwind ECOw.

At this stage it is possible to identify the general types of hydrocarbons and chemical that may be used during the construction (and operation) phases as provided in Table 7.1 below:

**Table 7.1 – Types of hydrocarbons and chemicals used during construction and operation phases**

Type of Pollutant	ITOPF Oil Group <sup>1</sup>	Use
Intermediate Fuel Oil (IFO)	Group 3	Used as fuel for vessels involved in installation and routine Operations and Maintenance (O&M)
Marine Gas Oil (Diesel)	Group 2	Used as fuel for vessels involved in installation and routine O&M.
Lubricating Oil	Group 3	Used for vessels involved in installation and O&M
Hydraulic Oil	Group 2/3	Hydraulic oil used within plant equipment
Chemicals	n/a	Various chemicals used routinely (e.g., solvents, coolants and cleaning fluids)
Transformer Oil	Group 3	Synthetic oil used in the turbine.
Gear Oil	Group 3	Oil for the yaw gear in the turbine.

## 7.2. Construction Pollution Control

The Forthwind HSE plan includes the requirement that the appointed offshore installation contractor will provide and implement a Marine Pollution Control Plan (MPCP) for the vessels used on the Forthwind project. The MPCP will define the potential nature and size of spills that may occur on the vessel and will include:

- The emergency response structure along with roles and responsibilities of the individuals.
- Identify and document alternates for key positions within the emergency response team.
- Tier 3 spills should conform to IPIECA (The global oil and gas industry association for environmental and social issues).
- Include potential spill scenarios including that of a fuel spill from a chartered vessel including impact assessment on when to report to authorities (via Forthwind).

Each installation vessel will be equipped with Spill kits according to their Ship Oil Pollution Emergency Plan (SOPEP). When the spill or release of a substance (e.g. oils, chemicals, grout etc.) occurs during the work process, the spill or release shall be stopped and/or contained until the proper clean-up procedure can be conducted. If the spill or release poses a reasonable risk to the health and safety of employees, a safety risk to the completion of the process or an undue risk to the environment, the work process shall be stopped, and the release shall be cleaned up or minimized until the risk is reduced to an acceptable level. A competent person, familiar with the process, the released substance and the affects posed to personnel and the process, shall be responsible for determining the risk associated with a spill or release.

The spill kits and booms shall be available on site and shall be of sufficient quantity and robustness to contain any, or all, of the potential spills. In all cases a site-specific risk assessment and method statement will be produced along with data sheets regarding the spilled materials or chemicals.

Spill preventive measures shall be followed while handling or transferring substances that poses a health, safety or environmental hazard. The following spill preventive procedures shall be used while transferring hazardous substances (e.g., refuelling and/or servicing equipment on site):

<sup>1</sup> [https://www.itopf.org/fileadmin/uploads/itopf/data/Documents/Company\\_Lit/ITOPF\\_Handbook22\\_web.pdf](https://www.itopf.org/fileadmin/uploads/itopf/data/Documents/Company_Lit/ITOPF_Handbook22_web.pdf)

- Position spills pan with absorbents below entry port.
- Ground equipment when transferring flammable substances.
- Transfer fluid at a controllable rate.
- Crew the control device (switch, valve, pump, etc.) until the transfer is complete.
- Do not smoke while transferring flammable substances.
- Do not use a cellular phone while transferring flammable substances.
- Do not allow distractions until the transfer is complete.

Contractors will identify suitable local contractors with a capability to respond on site within a 4 hour period to any spill that may occur. All spills, regardless of quantity – unless confirmed otherwise, will be reported to Marine Scotland by Contractors. Contractors will maintain the appropriate flow-charts for this process. If fuels are being transferred during bunkering operations, then an exclusion zone for all other vessels will be required of at least 750 meters.

### **7.3. Pollution Control Roles and Responsibilities**

Forthwind as the owner of the Forthwind Demonstration Project will retain overall responsibility for any spill associated with the project over its lifetime. Specifically, the Forthwind Project Director, on behalf of Forthwind, is responsible for:

- Ensuring that all Forthwind contractors and sub-contractors have in place and implement an appropriate pollutant inventory and spill response plans.
- Coordinating an ongoing spill response following the initial incident; and
- Consulting statutory bodies following any pollution incident.

The Forthwind Environmental Clerk of Works (ECOW) is responsible for:

- Ensuring that that all construction related Marine Licence and Section 36 consent conditions arrangements are in place and implemented (including pollution control measures).
- Monitor and report on compliance with the CEMP to the MS-LOT as part of their regular compliance reporting, as detailed in the CEMP.
- Reviewing relevant Contractor documents from a compliance perspective.
- Providing advice to the Forthwind project on compliance with consents conditions.
- Providing support in the induction of Forthwind staff and contractor personnel on site / works environmental policy and procedures; and
- Being primary contact in the Forthwind team for any environmental incident response.

The Forthwind appointed contractors are responsible for:

- Implementing an appropriate Marine Pollution Control Plan (MPCP) for the vessels used on the Forthwind project.
- Maintaining an appropriate emergency pollution incident response procedure and structure along with roles and responsibilities of the individuals.
- Ensuring that a suitable local contractor is retained with a capability to respond on site within a 4 hour period to any spill that may occur.
- Continually monitoring potential pollution risks, identifying when a pollution incident has occurred and immediately reporting to MS-LOT all spills as soon as is practicably possible after the incident.

### **7.4. Pollution Incident Reporting**

Forthwind has a procedure (FW1.PRC.03 - Forthwind Accident and Incident Reporting Procedure) that forms the Forthwind Demonstration Project approach to reporting, investigation and follow-up in the event of an accident or incident arising from areas of community, health, safety, environment and security.

## **8. MANAGEMENT MEASURES TO PREVENT THE INTRODUCTION OF NON-NATIVE SPECIES**

To reduce the spread of invasive non-native species the International Maritime Organisation (IMO) developed the International Convention for the Control and Management of Ships' Ballast Waste and Sediments 2004,

which applies to all commercial shipping designed to carry ballast water, which came into force internationally on 08 September 2017.

Forthwind will require all vessels used on the Forthwind Project to comply with the requirements of the Convention and with the MCA associated Marine Information Note (MIN 569). It is likely that the turbine, structure and piles will be shipped from a UK or Northern European port, minimising the risk of introduction of non-native species. However, to ensure full protection against the introduction of non-native species, Forthwind has produced a draft Biosecurity Management Plan that will undergo consultation before being issued for implementation prior to the commencement of construction works.

## 9. UNPLANNED ARCHAEOLOGICAL DISCOVERIES

Four sites are recorded on the National Monuments Record of Scotland (NMRS) held by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) including maritime losses within 2 km of the Forthwind site (the Cosmos, the Cremona, Peggy and Susan and a Pilot Boat). There is no evidence for them found in the geophysical data gathered from previous surveys and for each record the position is listed as 'arbitrary'. It is unlikely that the sites exist within 2km of the Forthwind site.

Based on the NMRS, RCAHMS and survey information undertaken to date, it is concluded that there are no known assets of archaeological value existing within the Forthwind project area. However, to mitigate the risk of damage to any previously unrecorded archaeological remains a draft Forthwind project WSI and PAD has been prepared to mitigate construction, operation and decommissioning impacts in the event of any unexpected archaeological discoveries during works. The WSI and PAD will undergo consultation before being issued for implementation prior to the commencement of construction works.

The PAD will be in place for the life of the Proposed Development and will be updated when required should details within the document change, for example contact details for key stakeholders.

## 10. REPORTING OF ENVIRONMENTAL PERFORMANCE DURING CONSTRUCTION

Forthwind will ensure that the Forthwind ECoW will provide monthly reports to Marine Scotland and other relevant stakeholders for the duration of the offshore installation works. All Forthwind contractors will be required to provide regular reports to the Forthwind Project team, including details of environmental incidents (if any), environmental statistics, and records of any environmental audits and inspections undertaken and such other information as may be required for the Forthwind monthly report to MS-LOT.

Communication type	Proposed frequency	Relevant stakeholders
ECoW Compliance Report	Monthly	MS-LOT Copied to NatureScot
Forthwind Project Manager	As required	MS-LOT
Forthwind Project Manager	As required	Project stakeholders
Incident reporting	As required	MS-LOT
Other returns required by the Offshore Consents	As required	MS-LOT



F O R T H W I N D

## MARINE MAMMAL OBSERVER (MMO) PROTOCOL

**FW1.PRC.0001**

Confidentiality Status: For Public Consultation

SIGNATURES					
Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved by
A1	24/04/2022	For Consultation	M Murray	G Lee	M Murray

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## 1. BACKGROUND

This Marine Mammal Observer (MMO) protocol has been developed to ensure compliance with the Forthwind Project Environmental Monitoring Plan (PEMP). The purpose of this document is to ensure a record of any sightings of marine mammals is captured and maintain a record of the action taken to avoid any disturbance being caused to marine mammals during pre-construction and geophysical surveys and construction activities.

## 2. RESPONSIBILITIES

The following personnel have specific responsibilities regarding the execution of this MMO procedure:

<b>Forthwind Project Manager</b>	Responsible for ensuring all those involved in the installation of the piles and turbines are aware of the Section 36 and Marine License conditions and specifically the importance of this MMO protocol. Responsibility to ensure adherence to this MMO protocol.
<b>Forthwind Environmental Clerk of Works (ECOW)</b>	Responsibility to ensure all contractors and Forthwind employees are aware of, and adhere to, this MMO protocol.
<b>Drilling Manager</b>	Responsible for the commencement of activities associated with the installation of the piles. This person will maintain an open communication channel with the MMO to ensure no noisy installation operations commence unless the MMO protocol has been fully adhered to.
<b>Marine Mammal Observer</b>	A suitably trained individual will be designated as the MMO.

## 3. OBSERVER LOCATION

The MMO protocol is designed to be used onboard the installation vessel. A trained member of the ship's company or Forthwind project will be nominated to be responsible for carrying out observations; during which time this person will not be conducting any other duties. The MMO will be stationed on the jack-up vessel from which the piles will be drilled.

## 4. IDENTIFICATION OF THE NOISY INSTALLATION OPERATIONS REQUIRING A MMO

Table 4.1 below provides details of the piling process. Where piling operations have the potential to be 'noisy' it has been indicated that they will require an MMO to be in place during the completion of that activity. It is not anticipated that a MMO is required for the turbine installation and commissioning phases.

*Table 4.1 - Piling Procedures requiring an MMO*

ID	Activity	MMO Required?
1	Mobilisation of JUB from staging port to installation site	No
2	Clearance of debris or levelling of the piling area	No
3	Lowering of legs of jack-up to seabed and 'jacking-up'	Yes

ID	Activity	MMO Required?
4	Lowering of seabed frame “template” on seabed	Yes
5	Lowering of sacrificial casing and drilling conductor to self-penetrate the overburden	No
6	Sacrificial casing and drilling conductor will be “vibrated” to achieve a seal at the tow of the sacrificial casing in the rock	Yes
7	Pile top drill rig will be lifted into position	No
8	Drilling equipment lowered into place and run to mudline	No
9	On reaching mudline the driller will begin drilling	Yes
10	Upon completion of drilling, the drill bit and associated equipment is disconnected and removed.	No
11	Once the sacrificial casing is unobstructed, the permanent works pile will be lowered through the water column and into the open socket.	No
12	Grouting of the annulus between the pile and open socket up to the toe of the sacrificial casing	No
13	The process (5 to 12) is repeated for each additional pile at the turbine location	As before
14	Retrieval of the seabed frame “template” from the seabed	Yes
15	Jacking-down and lifting the jack-up legs from the seabed	Yes
16	Return of the JUB to the staging port	No

## 5. THE MMO PROTOCOL

The methodology requires clear, two-way communication channels to be maintained between the MMO and the drilling manager. The MMO and drilling manager will test the communication procedure in advance of the commencement of works.

Table 5.1 below provides a detailed breakdown of how communication will work during the installation of the piles. This procedure will be followed for each of the noisy installation operations identified in Table 2 as requiring an MMO.

*Table 5.1 - Forthwind MMO Protocol*

ID	Activity
1	The MMO stationed on the JUB to conduct observations 30 minutes prior to the commencing noisy installation operations (as defined in Table 4.1). MMO has radio contact with the drilling manager stationed on the JUB who is responsible for commencing piling activities.

ID	Activity
2	MMO starts observation protocol – observations of the location site (+ 500m zone)
3	MMO retains radio contact with the Drilling Manager, ensuring that noisy installation operations are prepared to only commence once clearance is given by the MMO.
4	MMO gives radio clearance to the Drilling Manager for noisy installation operations to commence following completion of the MMO protocol.
5	Noisy installation operations commence.
6	MMO observations continue during noisy piling operations to note any behaviour effect on marine mammals
7	Noisy piling operations complete. MMO ceases observations
8	Noisy installation operations may not recommence unless items 1 – 4 have been undertaken. The drilling manager will be responsible for communicating this to the MMO via radio, and to all installation personnel, to ensure that no noisy installation operations commence without following the MMO protocol.
9	Noisy installation operations will not commence during the hours of darkness when the MMO is unable to function. Noisy installation operations which need to continue into the hours of darkness must commence under the Forthwind MMO protocol during daylight hours.
10	Any sightings during MMO observations will be recorded in a formal log (as outlined in Appendix A). Whether or not marine mammals are sighted, the formal log will be completed for each period of noisy installation operations.

## 6. ADDITIONAL MEASURES

In addition to the provision of an MMO and use of the MMO protocol, a soft start procedure (where noisy installation operations commence at their lowest noise generating setting and slowly built up) will apply for piling operations on the Forthwind Project.

## 7. TRAINING

The Forthwind Project Manager will communicate prior to the commencement of installation and to all personnel involved in installation, the responsibilities held within the licenses granted by Marine Scotland (and within this MMO protocol) pertaining to the installation of the piles.

## 8. REPORTING

The recording forms as detailed within the Forthwind MMO protocol will be completed and submitted to Marine Scotland alongside a brief report within eight weeks of the cessation of installation activities for the piles.





## FORTHWIND DEMONSTRATION PROJECT

### BIOSECURITY MANAGEMENT PLAN

Confidentiality Status: Draft for Consultation

SIGNATURES					
Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved by
A1	20/04/2022	For Consultation	G Lee	M Murray	M Murray

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## 1. INTRODUCTION

This document is a Marine Non-Native Species (NNS) and Biosecurity Management Plan (BMP), known collectively for the purpose of this document as the BMP, which will be in place for the duration of the Forthwind Project (i.e. the construction, operations and maintenance, and decommissioning phases).

The aim of this Plan is to minimise the introduction or spread of Non-Native Species from the Forthwind Project area and addresses the management of installation & maintenance vessels and the arrangements for managing the turbine foundation to prevent the establishment of NNS.

NNS are those species, subspecies or lower taxon, introduced (i.e. by human action) outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce which have become established outside of their natural range. They can have a significant negative impact on native species and their habitats, the environment, the economy, or the health of the general public. It is important for the Biosecurity Plan for the Forthwind Test and Demonstration Project is regularly reviewed and maintained – as such the BMP will be treated as a ‘live’ document and will be updated at each phase of the Forthwind project in accordance with the threats identified from each phase activities.

### 1.1. Legislation and Policy

#### 1.1.1. *International Convention for the Control and Management of Ships’ Ballast Water and Sediments*

All applicable vessels that travel to the site from outwith UK waters will comply with the IMO Ballast Water Management (BWM) Convention which entered into force on 8 September 2017 and establishes standards and procedures for the management and control of ships’ ballast water and sediments.

Under the Convention, all ships of 400 gross tonnes (gt) and above in international traffic are required to undergo a survey regime and hold appropriate certification for their ballast water and sediment management (including having a ship-specific ballast water management plan). The UK has delegated survey and certification requirements and Ballast Water Management Plan approvals to the Maritime and Coastguard Agency (MCA)

All ships will also have to carry a ballast water record book and an international ballast water management certificate.

#### 1.1.2. *Wildlife and Countryside Act 1981 & The Wildlife and Natural Environment (Scotland) Act 2011*

Section 14 of the Wildlife and Countryside Act 1981 & The Wildlife and Natural Environment (Scotland) Act 2011 requires everyone to take all reasonable steps to ensure biodiversity. This legislation has specific provisions for the offence of the deliberate release of non-native animals and some plants, including offences of:

- *Causing animal to be in a place outwith its native range* – which can include the accidental transfer and spread of non-native animals; and
- *Planting or causing any plant species to grow in the wild outwith its native range* and this includes species of seaweeds and plants, such as cord grass, which can grow in the marine environment.

#### 1.1.3. *The Merchant Shipping (Anti-fouling Systems) Regulations 2009*

The Merchant Shipping (Anti-fouling Systems) Regulations 2009 prohibit the use of harmful organotin compounds in anti-fouling paints used on ships and establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

The Regulations provide powers for the MCA to issue an International Anti-fouling System Certificate to ships of 400gt or above and every ship which is certified to carry 15 or more persons.

#### 1.1.4. *Non-Native Species: Code of Practice*

In Scotland, where an NNS is present and control or eradication of that species is imperative, legislation provides powers to government agencies to offer voluntary Species Control Agreements (SCA) and, if that fails, serve

Statutory Species Control Orders (SCO). SCOs operate on the 'polluter pays' principle. The Code of Practice<sup>1</sup> on Non-Native-Species recommends:

- Adopting a precautionary approach and not carrying out operations which might lead to the spread of NNS until there is a clear understanding of the situation.
- Carrying out risk assessments to understand the risk of spreading a NNS, setting out how to avoid it happening.
- Seeking advice and following good practice.
- Reporting the presence of NNS.

Nature Scotland recommend that NNS are removed at source, before vessels travel to Scotland and that ballast water and sediment is checked before leaving other ports and an external inspection is carried out.

### 1.2. Pathways of introduction

Common pathways of introduction in the marine environment include commercial shipping, the transport of organisms for aquaculture and recreational boating. Construction and operating renewable devices can provide a clean surface for settlement of native and non-native species, potentially providing 'stepping-stones' around our coast. The movement of vessels, barges, equipment and renewable devices themselves, both around the UK coast and internationally, could also allow the accidental transfer of invasive non-native organisms.

As our climate changes conditions in Scottish waters may become more favourable for new species to increase their northerly limits and establish in the Firth of Forth.

### 1.3. Species of Concern

Nature Scotland have identified several marine NNS that have become widespread and well established in Scotland<sup>2</sup> including:

- Wireweed (*Sargassum muticum*)
- Green sea fingers (*Codium fragile subsp. tomentosoides*)
- Common cordgrass (*Spartina anglica*)
- Red alga (*Dasyphyllia japonica*)
- Acorn barnacle (*Austrominius modestus*)
- Japanese skeleton shrimp (*Caprella mutica*); and
- Leathery sea squirt (*Styela clava*).

Invasive species that are found only in patchy locations within Scotland include:

- American Lobster (*Homarus americanus*)
- Non-native seaweed, (*Undaria pinnatifida*)
- Carpet Sea Squirt (*Didemnum vexillum*)
- Pacific Oyster (*Crassostrea gigas*)

In addition, there are a number of species of concern that are present in the British Isles but have yet to reach Scotland, including:

- Chinese mitten crab (*Eriocheir sinensis*)
- Slipper limpet (*Crepidula fornicata*)

### 1.4. The Forthwind Test and Demonstration Project

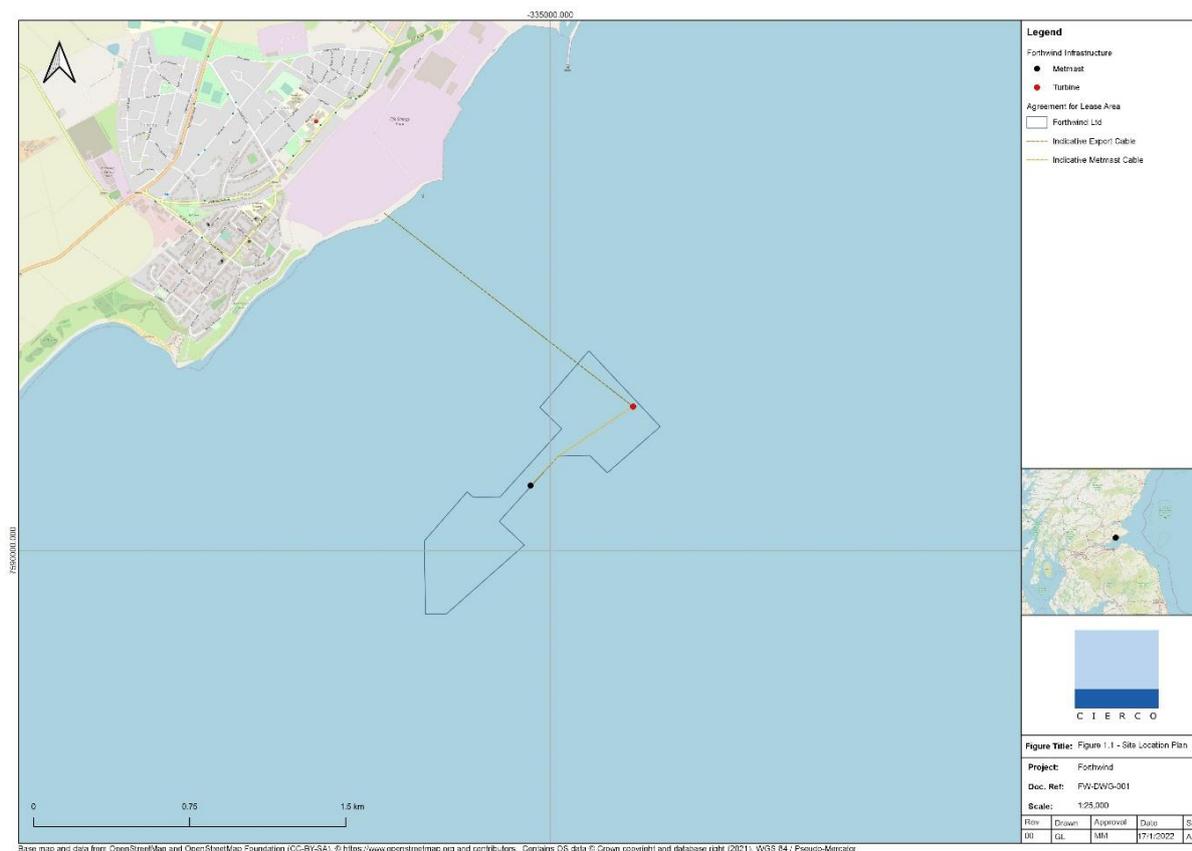
The Forthwind Test and Development Site proposes to install one offshore wind turbine with a nominal capacity of up to 20MW and a Meteorological Mast (MetMast). The proposed locational arrangements, with a 100m micro-siting allowance, is shown in Figure 1.1 below.

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<sup>1</sup> <https://www.gov.scot/publications/non-native-species-code-practice/>

<sup>2</sup> <https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/marine-non-native-species>

Figure 1.1 - Site Location Plan



The Proposed Development is based on a 'project design envelope' which captures the full range of potential design options and is intended to provide enough flexibility to accommodate further expected refinement in design as the Proposed Development moves through the consenting process towards construction.

#### 1.4.1. Understanding the Biosecurity Risk of the Forthwind Project

NatureScot have produced biosecurity guidance<sup>3</sup> for producing site and operation based plans for preventing the introduction of NNS. Following this guidance, the Forthwind Site is assessed at 'significant risk' of introducing marine BBS as:

- The site is 1.5 km from shore and is considered fully saline as there are no freshwater inputs from any river or drainage channels within 1 km of the deployment site. As a result, it is considered as having the greatest risk of marine NNS establishment occurring.
- The met-mast and turbine will introduce a man-made structure into the environment. New vertical surfaces will be introduced within the water column, scour protection and rock placement material. This increases habitat complexity. There will be additional temporary man-made structures in the location during installation (e.g., jack-up barges).
- During the operational period, the met-mast and turbine will be fixed structures that can only be cleaned in situ.
- The addition of turbine and meteorological foundations may act as a stepping stone for non-native species brought in as larvae by ballast waters or biofouling on ships hulls

We are unaware, nor have any evidence, of the presence of NNS in the deployment site, although this will remain under review. The site-specific survey (see Forthwind Demonstration Project Environment Statement, Technical Appendix 10A, Methil Benthic Survey Report, Volume III) did not identify the presence of any invasive non-native species in the Study Area. In the Environment Statement, the receptor sensitivity is conservatively assessed as

<sup>3</sup> R.D. Payne, E.J. Cook & A. Macleod (Feb 2014) Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction of Non-native Species – accessed from <https://www.nature.scot/sites/default/files/2019-02/Marine%20Biosecurity%20Planning.pdf>

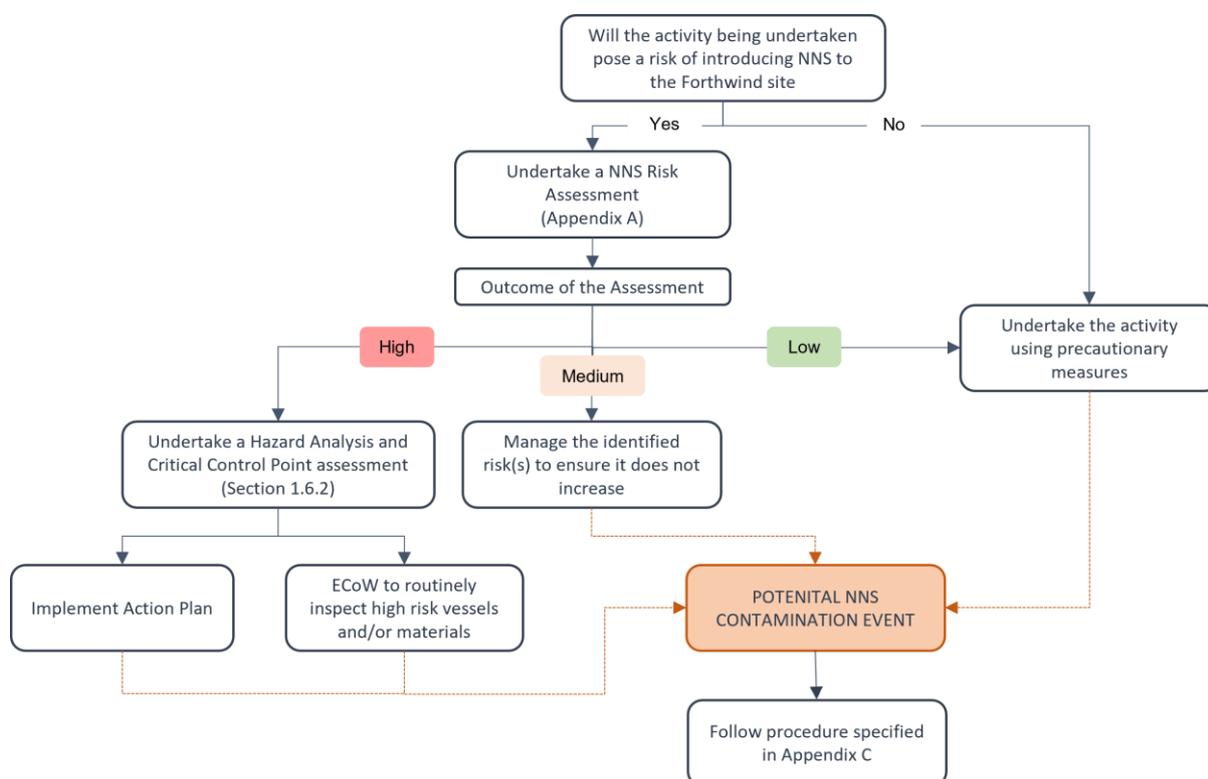
medium for possible colonisation by non-native species. Therefore, the significance of the effect is considered as minor and not significant in the 2015 Environment Statement. However, as the uncertainty associated with the assessment is very high given the preponderance of unknowns, a precautionary principle should be followed, where it should be assumed that marine NNS may be present and actions should be undertaken as if marine NNS are present.

The Forthwind project will only represent a very small contribution to any increased risk of spreading non-native species as there are already other artificial hard structures present in the area, which may be equally suitable for colonisation

## 2. BIOSECURITY PLAN PROCEDURE

Figure 2.2 outlines how the Forthwind Project will determine and manage biosecurity risk on site and the actions to be undertaken:

*Figure 2.2 – Determination and management of biosecurity risks on site*



### 2.1. Identified Risks for Introducing Marine Non Native Species at the Forthwind site

The main vectors identified for NNS to enter the Forthwind Development area are listed below:

1. NNS transported from other areas via installation, operational and maintenance, and decommissioning vessels (e.g. installation vessels and barges).
2. Import of materials onto site.
3. Disposal or re-use of used structures and/or equipment.
4. Fishing vessels from other areas operating within the Forthwind Development area.
5. Commercial vessels from other areas operated within the Forthwind Development area.
6. Recreational water users moving in and out of the Forthwind Development area.

Activities from 1 to 3 will be undertaken throughout the duration of the Forthwind project (construction, operation and decommissioning) and the Forthwind project will need to ensure that there is a high level of control over the activities which have the potential to introduce NNS.

**2.2. Managing Risk of Marine Non Native Species introduction at the Forthwind Site**

Each vessel entering the Forthwind Demonstration site will be required to complete a NNS risk assessment (Appendix A) based on the NatureScot Guidance.

For those vessels or packages of work that are identified as having a high risk of introducing marine non native species should undertake an in-depth Hazard Analysis and Critical Control Point (HACCP) assessment described below. This is a 5 step process based on NatureScot guidance that leads to the development of an action plan.

- **Step 1** - list the main activities that will take place on the Forthwind site as part of the installation or operation and will have a reasonable risk of leading to the introduction of an NNS. Between one and three activities at the various stages of installation or daily operation should be adequate but judgement is down to the assessor as to how many are adequate.
- **Step 2** – Provide a brief description of the activity based on “who, what, when, where, why and how”.
- **Step 3** – Split each activity into tasks and briefly describe the sequence that takes place.
- **Step 4** – Using the table below, list the tasks and consider the following for each task:

Task	Risk (Yes or No)	Justification	Critical Control Point	Control Measure	Who
Task 1					
Task 2					
Task 3					

*Risk* Is there a significant risk of the task leading to the introduction of NNS? Significant means any risk above low on a “low, moderate, high, severe” scale

*Justify* Set out the reasoning for the significance of the risk.

*Critical Control Point* Is this the most effective point to apply control measures. If the risk is significant, then subsequent tasks may be the best place to apply control measures. There must be at least one Critical Control Point (CCP) but there may be several more.

*Control Measure* If a control measure is necessary for this task, then describe it here.

*Who* Specify who will carry out the control measure

- **Step 5** – Take the identified control measures and develop an action plan setting out who will carry out the control measure, what they will do and when they will do it.

When (which task does the control measure apply to)	Activity		Who (who will carry out the control measure)
	How	How	
Control Measure 1			
Control Measure 2			
Control Measure 3			

**3. ROLES AND RESPONSIBILITIES**

**3.1. Forthwind Project Manager**

The Forthwind Project Manager will be responsible for the maintenance and implementation of the Biosecurity Management Plan. The Project Manager is responsible for the ensuring the effective resources to implement the BMP and for:

- Ensuring all relevant staff and contractors receive a copy of the project Biosecurity Management Plan and instructions.
- Ensuring that the ECoW possesses appropriate training in marine NNS identification.
- Ensuring that the BMP is up to date and that the requirements of this BMP are implemented.

### 3.2. Forthwind Environmental Clerk of Works

The Forthwind ECoW will be the main point of contact related to non-native species and is specifically responsible for:

- Undertaking routine biosecurity assessments, surveillance, inspection, monitoring and recording of equipment and vessels for marine NNS.
- Ensure that staff and contractors receive appropriate and regular toolbox talks on the issue of invasive NNS and on the identification of commonly found NNS.
- Inspecting all 'high' risk vessels or materials
- Ensuring that the required biosecurity measures are implemented.
- Notifying the Scotland Environment and Rural Services (SEAR) and Marine Scotland in the event of an NNS being identified on site.
- Producing the NNS management reports at key stages of the project.
- Updating this BMP as required.

### 3.3. Forthwind Staff and Contractors

All staff and contractors working on the Forthwind project site will receive appropriate training on the identification of NNS and will be encouraged to report any 'suspect' marine plant or animal to the ECoW. All Forthwind staff and contractors will be responsible for implementing the NNS biosecurity preventative measures identified.

## 4. MITIGATION OF THE IDENTIFIED NNS RISKS

Prevention of NNS entering the area is the most effective biosecurity tool. Controlling or eradicating either from an area once established can be very difficult. The following mitigation measures (Table 4.1) are designed to reduce the risk of NNS entering the Forthwind Development Area.

*Table 4.1 - Forthwind INNS Mitigation Measures*

Identified Risk	Mechanism	Mitigation Measure
Installation, operation and maintenance and decommissioning vessels operating within the Forthwind Development area.	Introduction of NNS through ships ballast or on hulls of vessels.	<p>Vessels working internationally should already be following International Marine Organisation (IMO) legislation regarding their ballast water management. This means ballast water should not be exchanged in coastal waters. To reduce the spread of invasive non-native species the International Maritime Organisation (IMO) developed the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004, enforced in 2017, which applies to all commercial shipping designed to carry ballast water.</p> <p>Forthwind will require all vessels used on the Forthwind Project to comply with the requirements of the Convention and with the MCA associated Marine Information Note (MIN 569). It is likely that the turbine, structure and piles will be shipped from a UK or Northern European port, minimising the risk of introduction of non-native species.</p> <p>The Forthwind project will require all staff, contractors and subcontractors to adhere to the following:</p> <ul style="list-style-type: none"> <li>• Complete a marine non-natives risk assessment (appendix A) when undertaking activities identified in section 2.1.</li> </ul>

Identified Risk	Mechanism	Mitigation Measure
		<ul style="list-style-type: none"> <li>All vessels 400gt or above to be possession of a current internal Anti-Fouling System Certificate (AFS) in compliance with the Merchant Shipping (Anti-Fouling Systems) Regulations SI 2009/2796 and Maritime and Coastguard Agency (2009), Merchant Shipping (Anti-fouling Systems) Regulations 2009.</li> <li>All vessels of 24m or more in length (but less than 400gt) are required to carry a declaration on AFS signed by the owner or authorised agent accompanied by appropriate documentation.</li> <li>Details of all ship hull inspections and biofouling management measures are required to be documented by the contractor and, where applicable, recorded in the contractor's Planned Maintenance System.</li> <li>All submersible equipment such as ROVs are required to be subject to pre-use and post-use checks including checks for the presence of marine growth/ NNS. All equipment will be required to be free of marine growth likely to encourage marine NNS, prior to mobilisation.</li> </ul>
Fishing vessels from other areas operating within the Forthwind Development Area	Introduction of NNS on either fishing gear or the vessel itself.	It is unlikely for fishermen to work within the Forthwind Development area. However, fishing vessels may operate within the vicinity of the Forthwind Project area. Forthwind will promote good biosecurity practices where possible.
Commercial vessels from other areas operating within the Forthwind Development Area	Introduction of NNS through ships ballast water or on hulls of vessels.	Vessels working internationally should already be following International Marine Organisation (IMO) legislation regarding their ballast water management. This means ballast water should not be exchanged in coastal waters. All commercial vessels should be regularly de-fouled and will be coated in anti-fouling paint, however this is regulated by Forth Ports and outside of the jurisdiction of the Forthwind project.
Recreational water users moving in and out of the Forthwind Development Area	Introduction of NNS on the hull of watercraft. This includes (but is not limited to); vessels, kayaks, paddleboards, and windsurfing boards.	There are several biosecurity campaigns targeting recreational water users which should be promoted where possible by Forthwind. These include the 'Check, Clean, Dry' campaign from the GB Non-Native Species Secretariat and 'The Green Blue' environmental program from the Royal Yachting Association (RYA). Both campaigns will be promoted on the biosecurity page on the Forthwind website.

#### 4.1. General Biosecurity Personnel Security Arrangements

The Forthwind Project will ensure that all personnel entering and leaving the site will follow the following basic biosecurity routine:

- Arrive with clean, dry footwear and equipment.
- **Check** – before leaving a site
  - Visually check footwear, boards, boat hulls and equipment for debris – plant and animal matter, small organisms, soil, seeds etc. and remove. Carry a basic biosecurity kit (brush and water) to help remove debris while on site.
  - Ideally rinse all your kit on site to ensure all debris is removed – remember some diseases aren't visible to the human eye and you might not recognise an invasive plant.
  - Drain any trapped water from inside kayaks and canoes.

- **Clean** – clean and wash footwear, clothing and equipment with appropriate disinfectants, ideally on site, where the washings should be left. If this is not possible bag your gear carefully and wash as soon as possible, but do not let the washings enter any watercourse or drains.
- **Dry** – dry your kit and clothing thoroughly, some species can live weeks in damp, moist conditions.

#### 4.1.1. Monitoring

Early detection will be critical in the event of INNS species arriving in the Forthwind Development area. The following monitoring measures are therefore very important:

- Forthwind should report the presence of any new INNS observed within the Forthwind Development Area during installation, operations and maintenance and decommissioning phases.
- NatureScot to investigate all reports of INNS and maintain records of these reports.

#### 4.1.2. Contingency Plan

If INNS is identified in the Forthwind Development Area then a rapid response from NatureScot will be critical.

Recording and Reporting INNS procedure:

- Record sighting of non-native species by;
  - Taking a photo / writing down a detailed description,
  - Identify the location (ideally within 100m of the sighting of the non-native species,
  - Note the date and roughly how many (or how much) of the non-native species you saw.
  - Record the above directly onto the iRecord page (<https://irecord.org.uk>), or via the Scottish Environment and Rural Services (SEARS) email: [info@sears.scotland.gov.uk](mailto:info@sears.scotland.gov.uk), or 24/7 customer service phone line: 08452 30 20 50.
- Review the Scottish List of INNS Priorities at – Prevention Priority Species at <https://www.nature.scot/doc/scottish-list-inns-priorities-prevention-priority-species> to determine risk level of species. If the species is considered ‘High-risk’ for either the Forthwind Development Area or wider infrastructure / community within the district, then further action will be required by NatureScot.

#### 4.1.3. Established INNS

Estuaries are known to be ‘hot-spots’ for the introduction of INNS and there are already well established non-native species present in the Firth of Forth.

NatureScot would not attempt to eradicate INNS unless as part of a national program. It is widely accepted that prevention is the best tool, as eradication attempts are very costly and difficult.

NatureScot continue to monitor the presence of species which may be present within the Forthwind Development Area.

## 5. MARINE NON-NATIVE SPECIES REPORT AND REVIEW

A short marine NNS management report will be produced at the end of the installation phase and on an annual basis during the operational period based upon the risk assessments and action plans developed for individual activities. The report will be produced and collated by the ECoW. The ECoW will also audit on an appropriate regular basis to ensure mitigation measures are being applied correctly.

This Biosecurity Plan will be reviewed before and after each key projects stage (e.g. installation, commissioning) and on a five-year rolling program following commencement of operations as a minimum.

**APPENDIX A – NATURESCOT MARINE BIOSECURITY PLAN RISK TEMPLATE**

Marine Biosecurity Plan Template	
Site Name or Description of the Operation	
Site / Operation Location	
Plan Period	
Biosecurity Manager	

Site features affecting biosecurity:

Salinity	
Submerged Structures	
Non Native Species known to be present	

Vessel Types using the site / involved in the operation:

Vessel Type	Risk Factors: Pathway, speed, biofouling control	Risk*: High / Medium / Low

Site activities which have a significant risk of introducing or spreading non native species:

Activity Description	
1	
2	
3	
4	
5	
6	

\* refer to Appendix 2 for guidance on risk score.

**APPENDIX B – RISK FACTOR TABLE**

		Risk of Marine Non Native		
		High	Medium	Low
1	Has the vessel/ equipment just arrived from the local area or UK Territorial Waters?			
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 free of bio-fouling? (a green 'slime' is OK)			
4	Do the visible submerged surfaces have more than a green 'slime' coating?			
5	Does the vessel/ equipment have noticeable clumps of algae and/ or animals clinging to the visible parts of the hull/ rudder/ propeller?			
6	Has the vessel/ equipment just arrived from another country, region or water body with similar environmental conditions? (e.g., seawater temperature)			
7	Has the vessel/ equipment just arrived from a water body known to have marine NNS 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?			

## APPENDIX C – ACTION TO BE TAKEN IN THE EVENT OF A SIGHTING OF A POTENTIAL MARINE NON NATIVE SPECIES

The ECoW will be trained in the identification of marine NNS. In the event of identifying the presence of a potential marine NNS, the following procedure should be followed:

1. The Forthwind ECoW should be informed immediately.
2. The Forthwind ECoW must determine if the species reported is a marine NNS by reviewing the Scottish List of INNS Priorities at – Prevention Priority Species at <https://www.nature.scot/doc/scottish-list-inns-priorities-prevention-priority-species> to determine risk level of species. If the species is considered 'High-risk' for either the Forthwind Project area or wider infrastructure / community within the district, then further action will be required.
3. The Scotland Environment and Rural Services (SEARS) should be contacted immediately to confirm identification in the first instance by contacting on email: [info@sears.scotland.gov.uk](mailto:info@sears.scotland.gov.uk), and the 24/7 customer service phone line: **08452 30 20 50**
4. The reported sighting should be recorded of the findings should include and be supported by:
  - Taking a photo of the NNS and surrounding area - also write down a detailed description,
  - Noting the scientific and or common name of the species
  - Noting the approximate numbers and the extent of the area where the marine NNS is present.
  - Identify the location of the sighting of the non-native species using an accurate grid reference or GPS coordinates
  - Note the date and roughly how many (or how much) of the non-native species you saw.
  - Note how it was found (e.g. attached to equipment)
  - Noting the name of individual who identified the marine NNS and who confirmed the identification (e.g. ECoW)
  - Record the above directly onto the iRecord page (<https://irecord.org.uk>), or via the Scottish Environment and Rural Services (SEARS).
5. If possible, and safe to do so, collect a sample in a plastic bag and send to the nearest SEAR location at NatureScot offices at 46 Crossgate, Cupar KY15 5HS Cupar.
6. If the marine NNS is confirmed by SEARS, the ECoW must report the incident to the Marine Scotland Licencing and Operations Team and Marine Scotland Science immediately.
7. The ECoW will inform other water-users and vessel operators in the vicinity.
8. In the event of a high alert species being found the Project Manager will:
  - a. Initiate immediate containment measures, including restricting vessel movements.
  - b. Co-ordinate with Forth Ports to undertake wider surveys of vessels and structures in the vicinity.
  - c. Seek further advice from Marine Scotland and NatureScot in the event if a marine NNS being found.
9. The ECoW should prepare a report for submission to Marine Scotland and NatureScot detailing the above and will include details of when the Forthwind ECoW has been informed of a potential 'high risk' vessels and the additional biosecurity measures that have been undertaken.



## FORTHWIND OFFSHORE DEMONSTRATION SITE

# FISHERIES MANAGEMENT AND MITIGATION STRATEGY

Confidentiality Status: Draft for Consultation

SIGNATURES					
Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved
A1	26/04/2022	For Consultation	M Murray	G Lee	M Murray

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## 1. PURPOSE AND OBJECTIVES OF THIS DOCUMENT

This Forthwind Fisheries Management and Mitigation Strategy (FMMS) has been prepared in response to a request within the Scoping Opinion and addresses aspects that are required to support the Marine Licence and Section 36 (S36). This is a draft document for consultation and will undergo updates following feedback from Stakeholders, input from the installation contractors and should any parameters of the project design or installation process change in response to new information.

The overall objective of this document is to set out the Forthwind projects approach to fisheries liaison and mitigation during the construction of the turbine and cable infrastructure. This document sets out the roles and responsibilities of key project personnel and details of mitigation measures to minimise disruption to fishing practices in the deployment area.

The FMMS is intended to inform project personnel, project contractors and the wider commercial fishing community. The Forthwind project will require compliance with the approved FMMS (and all other relevant, approved Consent Plans) by Contractors through condition of contract and by an appropriate auditing process. Similarly, Forthwind will require compliance with any relevant limits and commitments set out in the S36 and Marine Licence Application, the Environmental Impact Assessment Report (EIA Report). This FMMS has utilised the Marine Scotland draft “Fisheries Management and Mitigation Strategy Guidance Document” (2020)<sup>1</sup> in the preparation of this document.

Compliance with the FMMS will be monitored by the project Environmental Clerk of Works (ECOW), the Forthwind Fisheries Liaison Officer (FLO), the Forthwind Project Manager (PM), and the Marine Scotland Licencing and Operations Team (MS-LOT).

## 2. PROJECT OVERVIEW

The proposed Forthwind Demonstration Site is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). The Proposed Development Footprint Envelope consists of the following:

- A single turbine and sub-structure (foundation and tubular jacket) located at British National Grid reference (BNG) 337812, 697333. A 100 m micro-siting allowance from the centre point for the turbine and associated infrastructure is required for the final selection of turbine location.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- A metmast and sub-structure comprising a lattice steel tower located at NGR 337314, 696959. A 100 m micro-siting allowance from the centre point for the metmast and associated infrastructure is required for the final selection of metmast location.
- A communications cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the metmast.

Details of the locations of the turbine and metmast are included within 1.1, below:

*Table 1.1- Turbine and Meteorological Mast Location Coordinates - British National Grid*

	<b>Easting</b>	<b>Northing</b>
Turbine	337812	697333
Meteorological Mast	337314	696959

This FMMS is focused on the construction and operation of the Forthwind Offshore Wind Demonstration Turbine with associated infrastructure. A Series of geotechnical, geophysical and benthic surveys have been undertaken by Forthwind limited to understand the seabed conditions from the turbine location back to site. The

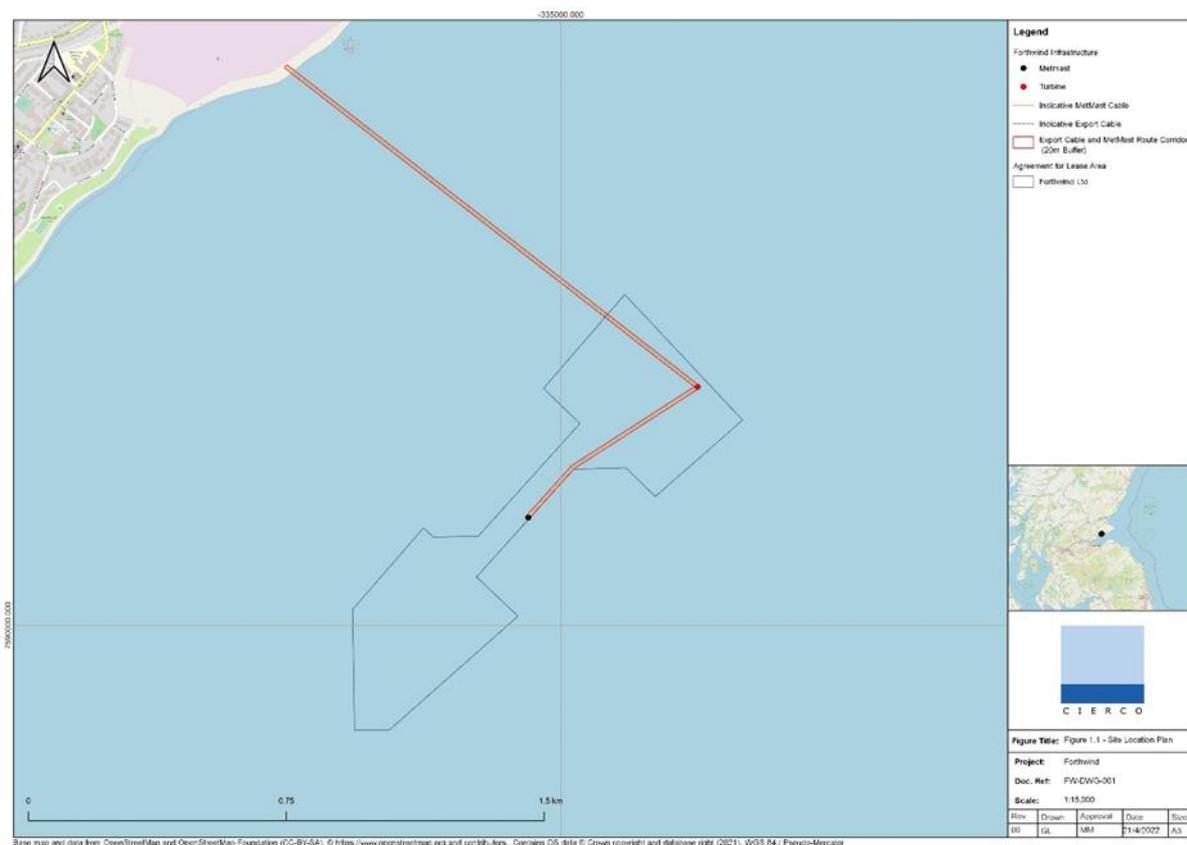
<sup>1</sup> [https://marine.gov.scot/sites/default/files/fmms\\_draft\\_guidance\\_document\\_1.pdf](https://marine.gov.scot/sites/default/files/fmms_draft_guidance_document_1.pdf)

information is being factored into the project design to define the exact cable route from the turbine to the onshore landing point at the Fife Energy Park.

The final location and layout of the cable presented in Figure 1.1 is subject to possible further minor route refinement ('micro-siting') following analysis of the data being collected and as the design moves forward. Micro-siting would be undertaken to route around any newly identified constraints and would not constitute a significant change to this FMMS.

It is anticipated that offshore construction will take approximately three months, across a period of approximately six months. After the construction period the turbine will undergo testing and commissioning before becoming operational. The Proposed Development will be operational for 25 years from final commissioning.

**Figure 1.1 - The Forthwind Project location**



## 2.1. Data to Inform the FMMS

This FMMS is supported by the information provided in Chapter 8 (Commercial Fisheries) and Chapter 13 (Shipping and Navigation) of the Forthwind Environmental Impact Assessment Report (EIAR). The EIAR also provides information on consultation with the fishing community undertaken to date in each area on the Forthwind project.

It is intended that following the issuing of a permit and licence by Marine Scotland a Fisheries Liaison Officer will be appointed and further consultation with the local fishing community and Forth Ports will be undertaken. This FMMS will be updated, after the permits have been issued and prior to construction activities of the Forthwind project commences, to include a review of base assumptions, update of the commercial fisheries data, and considering the feedback from consultation.

Forthwind intend to maintain membership of the Forth and Tay Commercial Fisheries Working Group to help inform the FMMS as we move forward with the project.

### 3. FISHERIES LIAISON STRATEGY

#### 3.1. Principles of Liaison

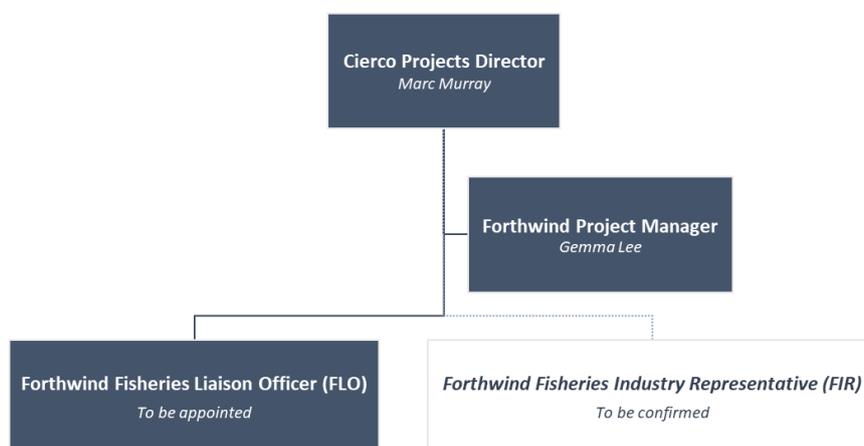
This FMMS has been drafted in compliance with the FLOWW (2014) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison<sup>2</sup>. It is understood that a review of this guidance is ongoing and this FMMS will be updated to reflect any changes following its publication. In the meantime, Forthwind will abide by the following principles:

- Forthwind will undertake regular and routine communications via Notices to Mariners (NtMs) to provide reasonable time (covering adverse weather etc.) to enable operational fishing business decisions to be made; and
- Forthwind recognise the importance of communication and will engage in constructive communication with local fishermen as we progress with our plans.

Pre-application consultation is provided in the Forthwind EIAR (Chapter 8, Commercial Fisheries).

#### 3.2. Liaison Roles and Responsibilities

The following provides an interim overview of the roles and responsibilities of the Forthwind Project team in liaison with the local fishing community. This organisation chart will be reviewed and updated prior to construction activities being undertaken.



##### Cierco Projects Director

The Cierco Projects Director will retain overall responsibility for ensuring that this FMMS is implemented and abided by. Specifically, the Projects Director will be responsible for:

- Progressing the construction of the Forthwind Project with the least disturbance practicable to local fishing interests.
- Maintain the employment of the Forthwind FLO throughout the lifetime of Forthwind.
- Act as the interim Fishing Stakeholder liaison until the appointment of the FLO.
- Agreeing potential disruption payments where appropriate.
- Primary representative on the Forth and Tay Commercial Fisheries Group and other industry forums as required.

##### Forthwind Project Manager

The Forthwind Project Manager will retain responsibility for:

- Preventing conflict with the local fishing interests through the appropriate, timely provision of information to the FLO, FIR and local fishermen.

<sup>2</sup> [ei-km-in-pc-fishing-012014-floww-best-practice-guidance-for-offshore-renewables-developments-recommendations-for-fisheries-liaison.pdf \(thecrownestate.co.uk\)](https://www.thecrownestate.co.uk/~/media/1/2/2/1/2014-floww-best-practice-guidance-for-offshore-renewables-developments-recommendations-for-fisheries-liaison.pdf)

- Provide sufficient detailed level of information to the fishing community in relation to the construction plans and planning of construction works.
- Act as an alternate representative on the Forth and Tay Commercial Fisheries Group and other industry forums as required.
- Organisation the survey vessel FLO coverage.

#### **Forthwind Fisheries Liaison Officer**

During previous discussions with the Scottish Fisherman's Federation (SFF), when Forthwind were considering the deployment of 2-B Energy technology, it was agreed that a Fisheries Liaison Officer (FLO) would be appointed following the permit approval from Marine Scotland. Forthwind will abide by its commitment and after appointment, the Forthwind FLO will be responsible for the following

- Maintain an effective communications channel with the fishing industry, any contractors or sub-contractors, other developers and other users of the sea.
- Provide information relating to the safe operation of fishing activity on the site of the Proposed Development
- Develop and maintain a strong positive working relationship with the local fishing industry.
- Understand the interactions likely to occur between the local fishing industry and the Forthwind project, and any potential impacts on the fishing industry during construction.
- Ensure that information is made available and circulated in a timely manner to minimise interference with fishing operations and other users of the sea.
- Maintain the fisheries stakeholder database that contains information on fishing vessel operations (e.g. vessel name, registration and port base, skipper and crew details etc.) within and around the Forthwind site.
- Prepare and distribute the required information and notices of all Forthwind activities which could affect fishing stakeholders.
- Instruct contractors on the fishing activities in the areas of work and provide details on the fishing activities and gear types that may be present, any relevant fishermen's sensitivities and channels and contact details for communicating with the fishing vessels at sea.
- Communicate details of any dropped objects to the fishing industry; and
- Communicate details of exposed cables and any other safety hazards to the fishing industry.

During offshore operations, the Forthwind FLO will also be stationed on a works/guard vessel to communicate directly with fishermen and request them to keep works locations free from gear to prevent risk to the fishermen or the works.

#### **Fisheries Industry Representative (FIR)**

It is recognised that for commercial scale offshore wind projects it is standard practice to employ one or more FIR's, however due to the scale of the project, its limited geographic coverage and relatively short duration of construction activities it is not intended to appoint a FIR for the Forthwind project. Instead as the area coverage affects a relatively select local inshore fishing, it is anticipated that it should be relatively practical for the Forthwind FLO to engage directly with the local inshore fishing boats. However, this solution will be consulted and agreed with the local fishing representatives prior to construction activities being commenced.

### **3.3. Project Communication Arrangements**

The Forthwind project will provide information on offshore project activities to the local fishing community through the Forthwind FLO. In addition, notices and information for fishermen (including survey and construction schedules, notification of any major maintenance activity, notices and activity specific information) will be distributed to all relevant fisheries interests.

For non-affiliated fishermen, HM coastguard and other marine users, Forthwind will notify the UK Hydrographic Office (UKHO) and Forth Ports of the proposed works in adequate time to help promote the maritime safety information (timing, location and vessel routes) and update of nautical charts, national and local Notice to Mariners (NtM), radio navigational warnings and Kingfisher alerts.

Table 3.1 below provides an overview of the communication arrangements during the different stages of the Forthwind installation and operations phases.

Activity	Communication Method	When	Responsibility
Construction and Installation	<ul style="list-style-type: none"> <li>• Notice to Mariners</li> <li>• Kingfisher Bulletin</li> <li>• Weekly Notices of Operations / Vessel Reports</li> <li>• Forth Ports notification</li> <li>• Offshore Wind and Marine Renewables Dropped Object Form</li> <li>• Fisheries Liaison Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Issued prior to activity mobilisation, as required during activity, and upon completion of activity.</li> <li>• Weekly construction status updates.</li> <li>• Dropped Objects reporting as required.</li> <li>• Provision of information to fishing vessels at sea as required.</li> </ul>	Forthwind FLO
Confirmation of final location	<ul style="list-style-type: none"> <li>• Provided to UKHO</li> </ul>	<ul style="list-style-type: none"> <li>• On completion of the works</li> </ul>	Forthwind PM
Post construction	<ul style="list-style-type: none"> <li>• Notice to Mariners</li> <li>• Kingfisher Bulletin</li> <li>• Weekly Notices of Operations / Vessel Reports</li> <li>• Forth Ports notification</li> <li>• Offshore Wind and Marine Renewables Dropped Object Form</li> <li>• Fisheries Liaison Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Issued prior to survey mobilisation, as required during survey, and upon completion of survey.</li> <li>• Dropped Objects reporting as required.</li> <li>• Survey report issued as relevant.</li> <li>• Provision of information to fishing vessels at sea as required.</li> </ul>	Forthwind FLO
Operation and Maintenance (Scheduled and unscheduled)	<ul style="list-style-type: none"> <li>• Notice to Mariners</li> <li>• Kingfisher Bulletin</li> <li>• Forth Ports notification</li> <li>• Offshore Wind and Marine Renewables Dropped Object Form</li> <li>• Fisheries Liaison Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Issued prior to activity mobilisation, as required during activity, and upon completion of activity.</li> <li>• Dropped Objects reporting as required.</li> </ul>	Forthwind FLO

### 3.4. Commercial Fisheries Potentially Affected

The Forthwind project is wholly located within ICES Rectangle 41E6. Based on the fishery activity identified within the Rectangle and discussions to date with the local fisheries, the following is initially considered the areas of potential interactions with the project activities:

Potential for interaction between Forthwind and Commercial Fisheries										
		Pre-Construction			Construction			Operations & Maintenance		
		Turbine	Cable	Survey	Turbine	Cable	Survey	Turbine	Cable	Survey
Fixed Gear	Salmon/ Sea Trout									
	Crab	x	x	x	x	x	x	x	x	x
	Razor clam									
	Lobster	x	x	x	x	x	x	x	x	x
Mobile Gear	Nephrops (Norway Lobster)	x	x	x	x	x	x	x	x	x
	Cod									
	Halibut									
	Mackerel									
	Mixed Squid and Octopi									

Potential for interaction between Forthwind and Commercial Fisheries									
	Pre-Construction			Construction			Operations & Maintenance		
	Turbine	Cable	Survey	Turbine	Cable	Survey	Turbine	Cable	Survey
Monks or Anglers									
Squid									
Whelk									

This table will be updated and agreed prior to construction as discussions with the local fisheries continue.

#### 4. FISHERIES MITIGATION STRATEGY

##### 4.1. Mitigation Principles

In accordance with the FLOWW (2014) Best Practice Guidance for Offshore Renewables: Recommendations for Fisheries Liaison, the Forthwind project will:

- Minimise the size and duration of advisory safety distances during the installation works, where safe and practicable to do so.
- Ensure that all offshore installation and vessel contractors employed on the project operate to appropriate safety working practices and possess appropriate safety management systems aligned with the contracted activities prescribed.
- Ensure that appropriate lines of communications is established between local fishing vessels and installation and O&M vessels employed on the Forthwind project.

##### 4.2. Co-existence Strategy

While Forthwind acknowledge that there are implications for fisheries practices during the construction phase including loss of available fishing area through the implementation of specific safety zones during construction and maintenance activities, the durations are relatively short.

Longer term there will be a relatively small loss of fishing grounds around the immediate locations of the turbine and met mast, however Forthwind will not seek to restrict fishing practices in the area and fishing gear can essentially return to previous levels of activity.

To ensure continued safe fishing operations within the area, the Forthwind project will:

- Ensure appropriate notification of the construction and maintenance activities to other marine users through the appointment of a project FLO.
- Provide sufficient marking and lighting of the project, as reflected in an agreed Forthwind Lighting and Marking Plan.
- Ensure the appropriate charting of turbine, met mast and cables post installation and provision of notification of any hazards.
- Adopt temporary safety zones and implement appropriate marine coordination arrangements to ensure vessel safety during installation and maintenance activities.

##### 4.3. Charting, Hazard Reporting, Safety Zones and Marine Coordination

The Forthwind project, following the issuance of the relevant Marine Licence and Section 36 consents will prepare for approval an appropriate project specific Navigational Safety Plan (NSP) and Vessel Management Plan (VMP). The NSP and VMP will ensure that project vessel operations are management in a manner to minimise navigational risk to other users of the sea and will set out:

- The navigational safety measures to be employed by the Forthwind project.
- Set out the management arrangements for the use of installation safety zones and guard vessels.
- Set out vessel movements, anchorage areas and marine coordination measures.
- Comply with the measures set out in the approved Forthwind Emergency Response and Coordination Plan (ERCoP); and

- Reflect the construction site buoyage as laid out in the Forthwind Marking and Lighting Plan.

All Forthwind project contractors and staff will be required to comply with the approved NSP and VMP.

The Forthwind Environmental Management Plan (EMP) sets out the arrangements where any objects dropped on the seabed during works associated with the Project will be reported and objects will be recovered where they pose a hazard to fishing or safe navigation, and where recovery is possible. Further details on the dropped objects reporting procedure are provided in the Forthwind EMP. All Contractors will be required to comply with the approved Forthwind EMP.

As stated previously, all installed infrastructure will be marked on the UK Hydrographic Office (UKHO) Admiralty Charts following completion of the works.

#### **4.4. Damaged and Lost Fishing Gear**

The Forthwind Project will ensure that all surface and sub-surface project details will be provided to Kingfisher Information Service – Offshore Renewable and Cable Awareness project (KIS-ORCA). This service can be downloaded onto a fishing vessels plotter to reduce risks of fishing near the development. The Forthwind FLO will also ensure that this information is promulgated to the local inshore fishermen.

The Forthwind FLO will also ensure that the local inshore fishermen are made aware of the Seafish et al 2016 guidance on reducing fishing risks whilst fishing. The guidance promotes the use of caution when fishing in the vicinity of subsea cables and offshore wind turbines, and to avoid endangering the fishing vessel or crew by attempting to retrieve when fishing gear is suspected to be snagged on a subsea cable.

Forthwind will use the Marine Scotland guidance on claiming for compensation for damage or loss of fishing gear loss of fishing time, or damage to vessel by suspected Forthwind activity. This guidance can be accessed at: [fmms draft guidance document 1.pdf \(marine.gov.scot\)](#). This procedure is provided in Appendix A – Guidance and claims form for damage to gear.

#### **4.5. Dropped Objects**

In the course of operations objects may be dropped in the marine environment. Forthwind is obliged to report such losses immediately to the Maritime and Coastguard Agency (MCA) and other organisations including MS-LOT within 24 hours. Forthwind has developed a procedure, “Reporting of Offshore Dropped Objects” (FW1-HSE.01-PRO-02) that identifies the measures to be put in place to manage and report dropped objects into the sea during the construction or operational phase of the Forthwind project, including recovery where possible and the recording of losses. It has been designed to meet with industry best practice and meet legislative requirements. This procedure also provides the route for communicating deposits made under circumstances of Force Majeure.

#### **4.6. Transit Plans**

This section will be updated, following the issuance of the Section 36 and Marine Licence and the appointment of the installation contractor. This section will identify routes to and from the construction/operation ports and the offshore wind turbine to minimise risk to commercial fisheries interests.

#### **4.7. Cooperation Payments**

This section will be updated, following the issuance of the Section 36 and Marine Licence and consultation with the affected fishing boats.

#### **4.8. Dispute Resolution**

Due to the scale and nature of the Forthwind project, it is thought that should be no requirement for an alternative dispute resolution (ADR) arrangement.

#### **4.9. Process for Updating the FMMS**

This is a draft document for consultation and will undergo updates following feedback from Stakeholders, input from the installation contractors and should any parameters of the project design or installation process change in response to new information.

## APPENDIX 1 – GUIDANCE AND CLAIMS FORM FOR DAMAGE TO GEAR

Guidance on claim for compensation for damage or loss of fishing gear, loss of fishing time, or damage to vessel by suspected offshore renewable activity.

Marine Scotland has produced the following guidance and the associated claim forms to assist both developers and skippers in reaching a resolution but has no role or responsibility in arbitrating claims. Accidental damage may be caused by vessels connected to renewable developments in a number of ways:

- Damage to fishing vessel by direct collision between vessels or through coming fast on obstacles which damages structural integrity or engines.
- Damage to fishing gear both static and mobile through interaction with vessels connected to renewables developments, with equipment or infrastructure deposited either deliberately or by accident.

The likely success of a claim will be dependent on the level of evidence both relating to the incident and to the associated costs that can be produced by the skipper.

### COMPENSATION CLAIM FORM

#### Section 1 – will be completed by the Skipper

Skipper should complete relevant sections where information is available.

Section 1.1 details of Skipper's vessel including name and registration of vessel

Section 1.2 Incident Information: dependent on what type of gear being used complete sections on mobile or static gear. Accurate information on location of incident is crucial in identifying potential parties who may have been responsible for losses.

Section 1.3 Details of implicated party if available – was a vessel seen in the area or is there AIS information available.

Section 1.4 Supporting evidence of other vessels in the area- will require a witness statement from another vessel.

Section 1.5 Full details of vessel damage or gear damaged- includes costs for repairs, replacement gear, lost catch, lost fishing time.

Section 1.6 Full details of Lost gear - includes costs for repairs, replacement gear, lost catch, lost fishing time.

Section 1.7 Details of insurance held for the vessel

Documentation – a complete list of evidence provided and copies of such things as fishing licence MCA safety certificate gear receipts. Evidence of loss of earnings.

Declaration of Skipper - must be signed by skipper.

#### Sections 2 and 3 - will be completed by the local fishery officer

Marine Scotland compliance – local fishery offices: [Marine compliance: fishery offices information - gov.scot \(www.gov.scot\)](http://www.gov.scot)

Section 2 - To be completed by the Inspector for Fisheries/Fishery Officer- Fishery Officer can comment on evidence produced.

Section 3 - To be completed by the Inspector for Fisheries/Fishery Officer- Verification of earnings (if Fishery Officer has access to information on similar types of vessels and can comment on likely earnings)

Section 4 - identifying relevant developer to whom claim submitted.

<p><b>COMPENSATION CLAIM FORM</b></p> <p>Claim for compensation for damage or loss of fishing gear, loss of fishing time, or damage to vessel by offshore renewable activity</p>	<p><b>Official Use Only</b></p> <p>Ref. No.</p> <p>Operator</p> <p>Block No.</p>
--	--

<p><b>SECTION 1: To be completed by the Skipper</b></p>	
<p><b>1.1 Vessel Information:</b></p>	
Name of Vessel	Registration No.
Name and Address of Skipper	Name and Address of Owner/Agent
Name of person on watch	Crew name(s)
<p><b>1.2 Incident Information:</b></p>	
Date of Incident	Type of Fishing in which engaged
Time of Incident	e.g. Creels / Trawl
<p>Nature of Incident</p> <p>e.g. how the incident occurred, how the skipper / crew responded, attempts made to retrieve gear</p>	

Please complete either section A or B depending on gear type used:

**A) Non-static Gear**

Start of Tow DD°MM.M'	Latitude:	Direction of Tow (°)
--------------------------	-----------	----------------------

	Longitude:	Speed of Tow (kn)
--	------------	-------------------

End of Tow	Latitude:	Wind Force (mph)
------------	-----------	------------------

(Position snagged)	Longitude:	Wind Direction (°)
--------------------	------------	--------------------

DD°MM.M'

**B) Static Gear** (coordinates of all gear lost / damaged)

Conditions	Wind Force (mph)	Wind Direction (°)
------------	------------------	--------------------

Number of fleets

Fleet lengths

Number of pots per fleet

	<b>Start Position</b> (DD°MM.M')	<b>End Position (DD°MM.M')</b>
--	-------------------------------------	--------------------------------

<b>Fleet 1</b>	Latitude:	Latitude:
----------------	-----------	-----------

	Longitude:	Longitude:
--	------------	------------

<b>Fleet 2</b>	Latitude:	Latitude:
----------------	-----------	-----------

	Longitude:	Longitude:
--	------------	------------

<b>Fleet 3</b>	Latitude:	Latitude:
	Longitude:	Longitude:
If more than 3 fleets were used please add details here:		
Number and description of surface markets used:		
<b>1.3 Details of implicated party (if available):</b>		
Name of Vessel	Registration No.	
Name and Address of Skipper	Name and Address of Company	

Evidence to support this party caused the damage

Where can the debris be inspected

Photographs attached?

(Yes/No)

AIS information attached?

(Yes/No)

Any other evidence to support damage or loss. Please add all relevant evidence

**1.4 Supporting evidence of vessels witnessing the incident: (if none write "NONE")**

Name of Vessel(s)

Statement(s) are: (attached or to follow)

**1.5 Details of Damaged Gear:**

Full details of vessel damage or gear damaged:

Value of replacement or repairs <b>(excluding VAT)</b>	Fishing gear:	£
Loss of fishing time	Vessel damage:	£
Fish lost/dumped due to contamination	Hours:            Value:	£
Total:	Quantity:        Value:	£
		<b>£</b>

**1.6 Details of Lost Gear:**

Full details of vessel damage or gear lost:

Value of replacement or repairs	Fishing gear:	£	
---------------------------------	---------------	---	--

<b>(excluding VAT)</b>	Vessel damage:		£
Loss of fishing time	Hours:	Value:	£
Fish lost/dumped due to contamination	Quantity:	Value:	£
		Total:	£

**1.7 Details of Insurance:**

The following details of the vessel’s Hull and Machinery Insurance are required if part of this claim relates to damage to the vessel

Insurer	Hull Excess	£
Policy No.	Machinery Excess	£

**Documentation:**

Fishermen should provide evidence, where possible, of e.g., fishing licence, MCA safety cert, photo plotter, photos of damage gear, original receipts from gear purchase. If claiming loss of earnings, please provide evidence of e.g., sales notes for time of year and accounts.

Please list all documents included with this claim form:

**1.7 Declaration of Skipper:**

I hereby certify that the details provided by me in this claim forms are, to the best of my knowledge, true and accurate

Signed ..... Print Name ..... Date .....

**SECTION 2:** To be completed by the Inspector for Fisheries/Fishery Officer



Number of Vessels used for average.		
Signed .....	Print Name .....	Date .....
Designation .....	Official Stamp:	

<b>SECTION 4:</b> To be forwarded to relevant developer of contractor, by owner, agent, or Fishery Officer as appropriate
Please enter address of developer or contractor:

## 1. INTRODUCTION

This Lighting and Marking Plan (LMP) has been prepared to inform the structure design and ensure that the markings of the Forthwind Demonstration project turbine:

- a) Are compliance with International Standards (IALA Recommendation o-139);
- b) Are compliant with Part 8, Chapter 2, Section 223 “Lighting of wind turbine generators in United Kingdom territorial waters” of the Air Navigation Order 2016.
- c) Are compliant with the requirements of the Maritime and Coastguard Agency’s Marine Guidance Note (MGN) 654 (M+F) “Offshore Renewable Energy Installations (OREI) – UK Navigational Practice, Safety and Emergency Response (April 2021).

The overall aim of the LMP is to set out the lighting and marking requirements during the construction and operation of the Forthwind Demonstration Project. Aimed at meeting current industry standards and good practice, this LMP specifically address the requirements of:

- Aviation lighting during construction and operation; and
- Marine navigational lighting and marking during construction and operation

### 1.1. The Forthwind Demonstration Project

The Forthwind Test and Demonstration site is located approximately 1.5 km offshore Methil and comprises wind turbine and a meteorological mast. The location of the turbine and metmast is contained within Table 1.1, below.

*Table 1.1 – Turbine and Meteorological Mast Location Coordinates – British National Grid*

	Easting	Northing
Turbine	337812	697333
Meteorological Mast	337314	696959

The key data and dimensions of the Forthwind turbine are contained within **Error! Reference source not found.**, below.

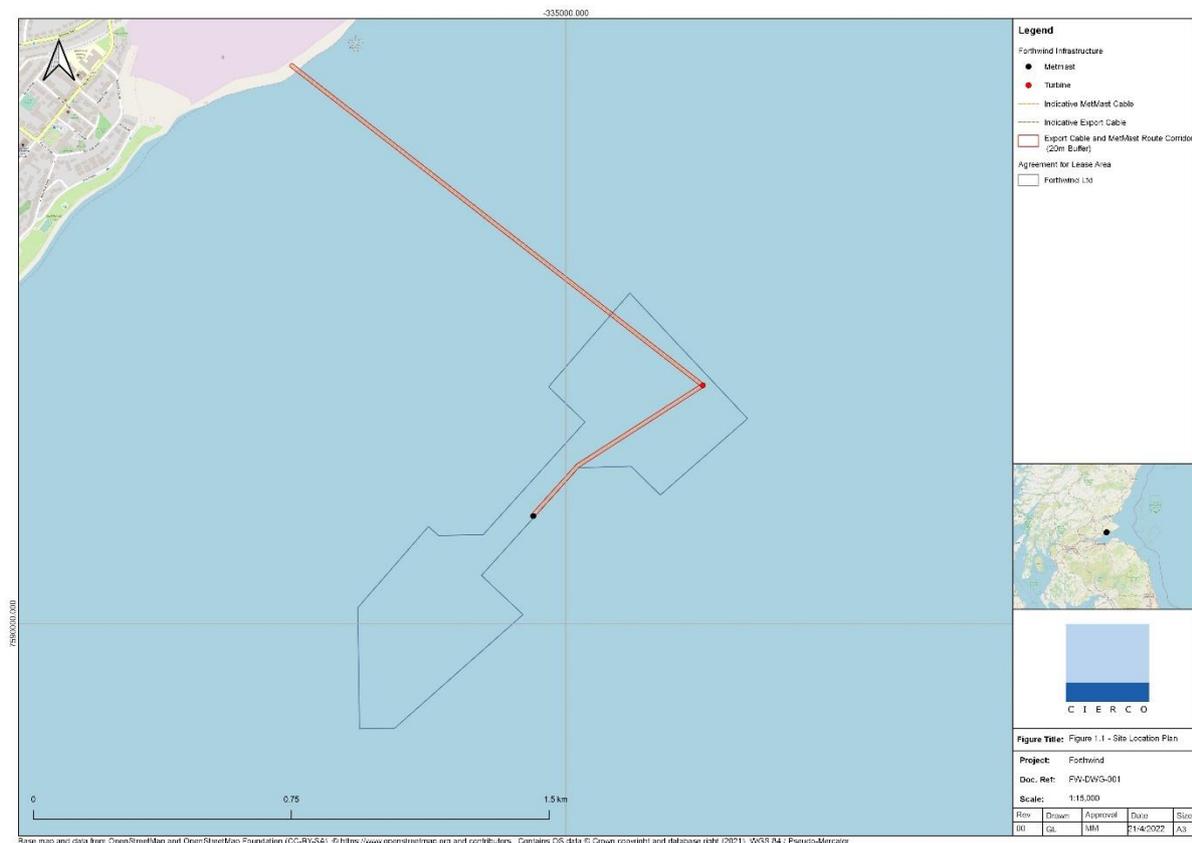
*Table 1.2- Key Data and Dimensions of the Forthwind Turbine.*

Key Data and Dimensions of the Forthwind Turbine	
Number of blades	3
Orientation	Upwind
Direction of Rotation	Clockwise
Rotor Diameter	255 metres
Length of rotor	122.5 metres
Blade swept area	51,070 m <sup>3</sup>
Hub Height	156 metres HAT
Tip Height above HAT	280 metres HAT
Blade Clearance to HAT	25 metres
Rated Capacity	Up to 20 MW
Voltage	66 kV
Converter	Full size
Structure	Tubular Steel Tower
Number of structure legs	4 legs on Steel Jacket / Transition Piece
Foundation	Pin piles (one per leg)
Design Life	25 years
M&O Access	Boat

## 1.2. Scope of the Lighting and Marking Plan

This LMP applies to the construction and operation of the Forthwind Demonstration Project, covering the lighting and marking of temporary, or part built fixed structures and completed offshore wind turbine array; including required buoyage.

**Figure 1.1 Forthwind Project Location.**



The LMP accords with current aviation and marine navigation lighting policy and guidance, as set out in Appendix A. The LMP will be reviewed and updated as and when necessary to ensure it maintains compliance with regulatory requirements.

The lighting and marking of vessels during construction will be managed through marine regulations including the International Convention for the Prevention of Collision at Sea (COLREGS) 1972. The Forthwind Demonstration Site is situated in a benign offshore site, sheltered from extreme sea conditions, off the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). The development comprises the following:

- A single turbine and sub-structure (foundation and tubular jacket if required) located at British National Grid reference (BNG) 337812, 697333. A 100 m micrositing allowance from the centre point for the turbine and associated infrastructure is required for the final selection of turbine location.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.

- A MetMast and sub-structure comprising a lattice steel tower located at NGR 337314, 696959. The sub-structure include foundations, a platform in the event of monopile foundation, and transition piece. A 100 m micrositing allowance from the centre point for the MetMast and associated infrastructure is required for the final selection of MetMast location.
- A communications cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the MetMast.

The Development Project Envelope is the area within which the Development is located; however, does not reflect the actual footprint of the Development infrastructure (which is significantly smaller).

The Firth of Forth is formed by the estuary of the River Forth, extending approximately 96 km from the tidal water limit at Stirling to the Isle of May. The Development is adjacent to the coast of Methil and Buckhaven, on the northern shore of the Forth. The coastline in this section runs in a southwest to northeast direction, and consists of reclaimed area of land made of colliery waste. The residential areas of Methil and Buckhaven are located further back inland. Much of the coastline in this section of the Forth is characterised by intertidal rock platforms, covered by thin veneers of sand.

The Energy Park is an area of industrial development and reclaimed land with an abrupt seaward boundary with the shingle beach having been removed and replaced with a quayside against which barges and other vessels are often moored. Oil rig shields and yards are now used for the fabrication of renewable energy structures, such as jackets for offshore wind turbines; and there are existing large-scale wind turbines at Methil Docks and the Levenmouth Demonstration Turbine (1 x 196m) on the coastal edge – a 7MW demonstration offshore wind turbine.

The stretch of coastline extending from Buckhaven to Methil is defended by a rock armour revetment, except for a sheet pile quay at the shorefront of the Fife Energy Park. Further west, between East Wemyss and Buckhaven, the coastline is formed by a soil and vegetation embankment. To the northeast there are docks of Methil and a concrete seawall that extends up to Leven.

### 1.3. Metocean Data

Published data is available for Methil as it is defined by the UKHO as a Secondary Port. Leith is the nearest Standard Port. The following table summarises the levels of the various tide states at Methil.

*Table 1.3 – Published tidal data for Methil defined by UKHO as a Secondary Port.*

	Chart Datum	Ordnance Datum
Lowest Astronomical Tide (LAT)	-0.2m	-3.1m
Mean Low Water Springs (MLWS)	0.7m	-2.2m
Mean Low Water Neaps (MLWN)	1.9m	-1.0m
Mean High Water Neaps (MHWN)	4.3m	1.4m
Mean High Water Springs (MHWS)	5.5m	2.6m
Highest Astronomical Tide (HAT)	6.1m	3.2m

### 1.4. Stakeholder Consultation

In line with Cierco's HSE Policy, we consult with relevant stakeholders on HSE issues. This specification will be consulted with the following:

Stakeholder	Reason
Scottish Ministers	The Scottish Ministers (via Marine Scotland) are responsible for the integrated management of Scotland's seas.
Forth Ports	Forth Ports exercise jurisdiction over all the waters of the Firth of Forth including the development site area. In addition to administering and being the local harbour authority (including Methil and Kirkcaldy Ports), Forth Ports PLC is also the Local Lighthouse Authority
The Civil Aviation Authority (CAA)	The CAA is responsible for safety and airspace regulation of civil aviation in the UK under the Civil Aviation Act 1982 and the Transport Act 2000.
The Maritime and Coastguard Agency (MCA)	The MCA mission is to deliver safety at sea, counter pollution response and the co-ordination of maritime Search and Rescue (SAR) through the UK.
The Defence Infrastructure Organisation (DIO)	The DIO is responsible for supporting the UK armed forces by building, maintaining and servicing the infrastructure needed to support defence. In this role, they are responsible for safeguarding the interests of the Ministry of Defence (MoD) with respect to the development of wind turbines and their potential to create a physical obstruction to air traffic movements and cause interference to Air Traffic Control and Air Defence radar installations
The Northern Lighthouse Board (NLB)	The NLB are responsible for the superintendence and management of all associated lighthouses, buoys and beacons.
The North and East Coast Inshore Fisheries Group (NESIFG)	The Scottish Regional Inshore Fisheries Groups (RIFGs) are non- statutory bodies that aim to improve the management of Scotland's inshore fisheries out to six nautical miles, and to give commercial inshore fishermen a strong voice in wider marine management developments. The NESIFG is the IFG that covers the development area.
Scottish Fishermen's Federation (SFF)	The SFF plays an active role in helping to inform fisheries science, the management of the marine environment, inshore fisheries management, marine spatial planning, and marine safety regulations. The Federation umbrella covers ten geographical/sectoral constituent associations representing more than 500 vessels from inshore creel boats to pelagic trawlers.
The Royal Yachting Association (RYA)	The Royal Yachting Association (RYA) is the national body for all forms of boating, including dinghy and yacht racing, motor and sail cruising, RIBs and sports boats, powerboat racing, windsurfing, canal and river boat cruising, and personal watercraft.

## 2. AVIATION MARKING AND LIGHTING

This section sets out the aviation lighting and marking requirements to be implemented on the Forthwind Demonstration Project. The lighting and markings proposed are designed to be compliant with the standards specified by the CAA and DIO.

### 2.1. Aviation Safety during Construction

Forthwind, or its contractor, will notify the Defence Geographic Centre ([ncap@hes.scot](mailto:ncap@hes.scot) / (0)131 651 6821 ) of the locations, heights and lighting status of the turbine and metmast, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, at least 10 weeks prior to the start of the offshore construction, to allow for appropriate notification to the relevant aviation communities.

Forthwind will ensure that they, or its installation contractor, will notify the aviation community of the turbine and metmast location, while the aviation charts are being updated, through the issuing of a Notice to Airmen

(NOTAM) at least 14 days prior to the start of construction. The NOTAM will be issued through the CAA Airspace Regulation ([AROps@caa.co.uk](mailto:AROps@caa.co.uk)).

## 2.2. Aviation Lighting during Routine Operation

The standard aviation lighting arrangements for the turbine and metmast during routine operations (i.e. no SAR or O&M activities in or around the wind array) will consist of two red top lights (hazard lights) of medium intensity (200 candela) adjustable to low intensity (200 candela). These lights will be visible from all directions and will flash in Morse code “W”. During O&M operations these lights will be turned off. During SAR activities in the area they will be switched on as a fixed red light (although they can be turned off at the request of the SAR coordination authority or SAR aircraft).

All turbine aviation lighting will be remotely controllable so that they can be switched on and off as required.

## 3. MARINE NAVIGATION LIGHTING AND MARKING

The marine navigation marking and lighting proposed is intended to be compliant with the current requirements for offshore wind farm structures as set out by Forth Ports, the MCA, the NLB and IALA. Forthwind will ensure that they, or its installation contractor, will notify Forth Ports (as the local Lighthouse and Harbour Authority) of all navigational marking and lighting of the site and its associated infrastructure and will request Statutory Sanction prior to deployment.

This section details the proposed permanent and temporary marine Aids to Navigation (AtoN), including lighting and marking, during construction, installation and operations of the Forthwind Development.

### 3.1. Marine Navigation Safety during Construction

A Notice to Mariners will be issued and promulgated, via Forth Ports, before the commencement of the works to inform mariners and the local fishing community of the nature and duration of the works.

The UKHO will be notified of the deployment of the buoys, turbine structure, cable route and the cable marker board to ensure that the relevant chart(s) are updated accordingly.

### 3.2. Temporary lighting and Construction Buoyage

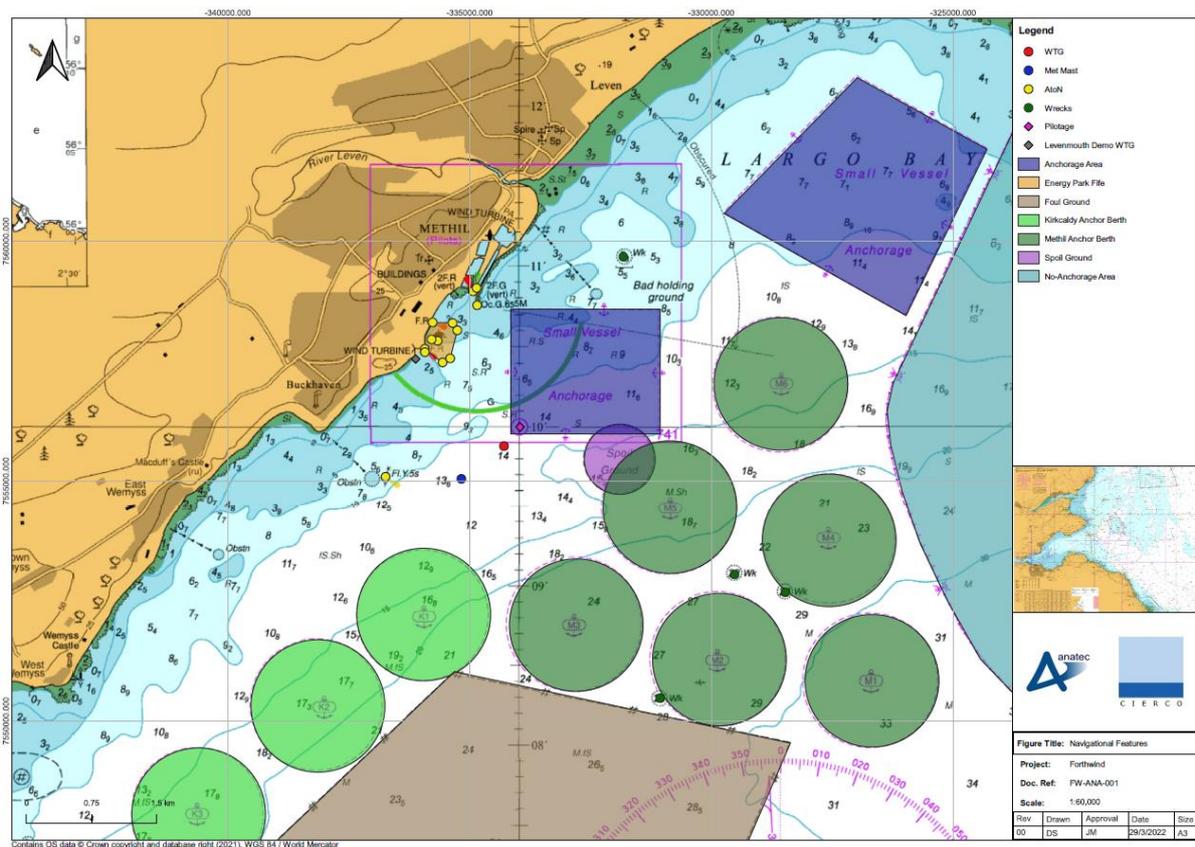
The structure pile foundations will be installed some time before the structure is installed. The installation programme for the Forthwind Demonstration Project is across approximately 6 months.

The development site will be marked as a construction area with the proposed lighting and marking arrangements set out in the table below:

	Specification
Lighting arrangements during Construction	<ul style="list-style-type: none"> <li>At the start of offshore operations, the construction site will be marked by 3 buoys, as shown in Figure 6. These will remain in place following the installation of the foundation piles up to the point of arrival of the wind turbine installation vessels.</li> <li>Each structure will have 1 self-contained marine lantern (360° visibility) during construction until the permanent Aids to Navigation are operational.</li> </ul>

Should there be a requirement for the temporary lighting and construction buoyage to be present on site for more than 6 months, statutory sanction will be sought and obtained from the Northern Lighthouse Board prior to deployment.

Figure 3.1 – Temporary Construction Buoyage



### 3.3. Marine Navigation Lighting and Marking during Operation

This section details the specification required for navigational lighting and sound signals to meet IALA and Forth Ports requirements.

#### 3.3.1. Marine Aids to Navigation on the turbine

This section details the marine Aids to Navigation (AtoN) including lighting, marking and sounds during the operation of the Development. The table below details the specification required:

Table 3 – Marine Aids to Navigation on the Forthwind Turbine and MetMast

Specification	
Lighting	<p>The turbine will be marked with a yellow light with the following characteristics</p> <ul style="list-style-type: none"> <li>• The light will flash once every 5 seconds (both turbine lights will be synchronised with each other)</li> <li>• The light will be visible from all directions</li> <li>• The lights nominal range will be 5 nautical mile, which will be reduced to 2 nautical miles for the landward side</li> <li>• IALA Category 1 Availability (99.8%)</li> <li>• The light shall be located not less than 6m, and not more than 30m, above Highest Astronomical Tide (HAT)</li> </ul>

<b>Aids to Navigation</b>	<ul style="list-style-type: none"> <li>• The turbine will be fitted with individual Automatic Identification Systems (AIS) transponder</li> <li>• The AIS transponder will be placed inside the nacelle / transition piece. The GPS antenna and HF antenna will be placed underneath the transition piece.</li> <li>• Prior to installation the AIS transponder will be licensed by Ofcom.</li> </ul>
---------------------------	---

### 3.3.2. Turbine Visual Markings

Each turbine structure will be marked as follows:

- The bottom end of the structure will be painted yellow (RAL 1004 Golden Yellow) from the level of Highest Astronomical Tide (HAT) up to 15 metres.
- Above this height the structure, turbine and blades will be painted grey (RAL 7035 Light Submarine Grey)

Forthwind do not intend to install any other structures apart from the wind turbine and metmast and as such there are no other structures within the development which require lighting or marking in relation to navigational safety.

### 3.3.3. Export cable Marker Boards

A Cable Marker Board (CMB) will be positioned as near as possible to the shoreline (but above MHWS) to mark the point at which the electricity export cables come ashore. The CMB shall be diamond shaped, with dimensions 2.5 m long and 1.5 m wide, background painted yellow with the inscription 'Cables' painted horizontally in black. The CMB shall be mounted at least 4 m above ground level.

### 3.3.4. Additional Lighting

Other lighting will be required for the turbine and structure (e.g. lighting of access ladders and general safety lighting on access platforms and the turbine, etc.). Forthwind will ensure that this light will not compromise the conspicuousness of the navigational marking lights. Low level lighting will be used on the boat landing platform and be fitted so as not to impact on the navigational lights.

**APPENDIX 1: APPLICABLE LEGISLATION, POLICY AND GUIDANCE****Aviation and Defence Infrastructure Organisation**

CAA Civil Aviation Publication (CAP) 764 “CAA Policy and Guidelines on Wind Turbines”, sixth edition February 2016

Ministry of Defence Obstruction Lighting Guidance, November 2014

CAA Civil Aviation Publication (CAP) 393 Air Navigation: The Order and Regulations, Fifth edition 25 August 2016 – In particular, Part 8, Chapter 2, Article 223 Lighting of wind turbine generators in United Kingdom territorial waters.

MCA “Offshore Renewable Energy Installations, Emergency Response Co-operation Plans (ERCoP) – Template for Construction, Operations and Decommissioning Phases”, October 2016.

MCE Marine Guidance Note (MGN) 654 (M+F) Offshore Renewable Energy Installations (OREIs) – Highlights issues to consider when assessing navigational safety and emergency response. Sourced from: <https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response>.

The Air Navigation Order 2016; sourced from: <https://www.legislation.gov.uk/ukxi/2016/765/contents/made>

**Marine Navigation**

MCE Marine Guidance Note (MGN) 654 (M+F) Offshore Renewable Energy Installations (OREIs) – Highlights issues to consider when assessing navigational safety and emergency response. Sourced from: <https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response>

International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendations 0-139 (the Marking of Man-Made Offshore Structures, Edition 2) (IALA, December 2013); sourced from:

Department for Environment and Climate Change (DECC) Standard Marking Schedule for Offshore Installations (DECC, 2011).



## FORTHWIND OFFSHORE DEMONSTRATION SITE

### Environmental Monitoring Plan

Confidentiality Status: Draft for Consultation

SIGNATURES					
Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved
A1	26/04/2022	For Consultation	M Murray	G Lee	M Murray

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## 1. INTRODUCTION

### 1.1. Background

This Forthwind Project Environmental Monitoring Plan (PEMP) has been prepared in response to the Forthwind Scoping Opinion received December 2021 and applies to the Forthwind Offshore Test and Demonstration Site located offshore Methil, Scotland. The Wind Farm and offshore transmission works are collectively referred to as the 'Proposed Development'. This is a draft document for consultation and will undergo updates following feedback from Stakeholders, input from the installation contractors and should any parameters of the project design or installation process change in response to new information.

### 1.2. Objectives of the PEMP

The overall objective of the PEMP is to provide the overarching framework for environmental management during the construction of the Forthwind Offshore Wind Demonstration Turbine.

The PEMP is designed to provide practical guidance to those involved in the construction and operation of the Project, including Forthwind personnel, Contractors and the Forthwind Environmental Clerk of Works (ECOW), on the series of measures to mitigate or manage environmental impacts based on commitments made by Forthwind and the anticipated requirements of the Offshore Consent conditions.

All Forthwind personnel and Contractors involved in the Proposed Development must comply, as a minimum, with this PEMP.

### 1.3. Scope of the PEMP

This draft PEMP describes the objectives and methodologies for monitoring surveys and proposed programmes for monitoring and reporting on:

- Birds (seaducks and diver species)
- Marine mammals

This draft PEMP has been prepared to form the basis for consultation on and approval of the monitoring approach and survey methodology. It is intended that this document will be updated following the feedback from consultees and a final version sent to Marine Scotland Licencing and Operations Team (MS-LOT) for approval prior to construction activities commencing.

## 2. PROJECT OVERVIEW

The Proposed Development is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). The Proposed Development Footprint Envelope consists of the following:

- A single turbine and sub-structure (foundation and tubular jacket) located at British National Grid reference (BNG) 337812, 697333. A 100 m micro-siting allowance from the centre point for the turbine and associated infrastructure is required for the final selection of turbine location.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- A metmast and sub-structure comprising a lattice steel tower located at NGR 337314, 696959. A 100 m micro-siting allowance from the centre point for the metmast and associated infrastructure is required for the final selection of metmast location.
- A communications cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the metmast.

Details of the locations of the turbine and metmast are included within Table 2.1, below:

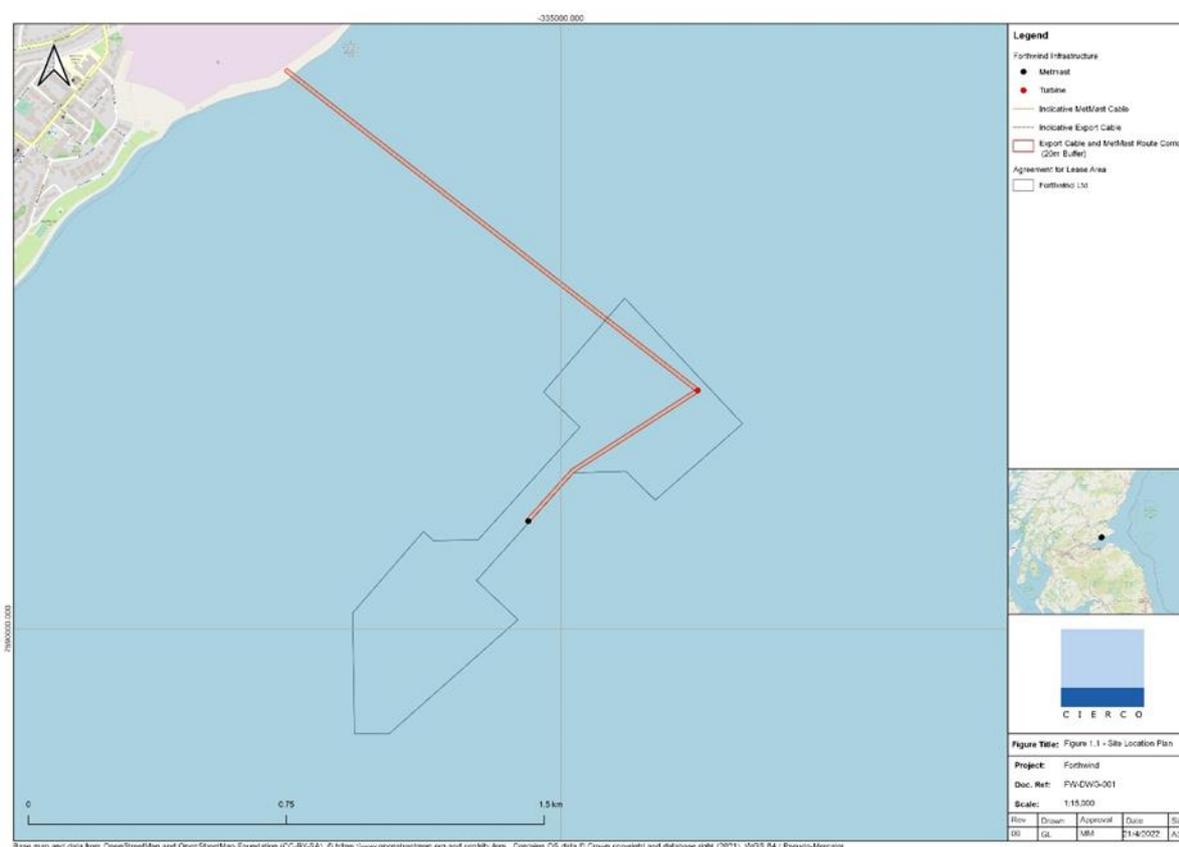
**Table 2.1- Turbine and Meteorological Mast Location Coordinates - British National Grid**

	Easting	Northing
Turbine	337812	697333
Meteorological Mast	337314	696959

This PEMP is focused on the construction and operation of the Forthwind Offshore Wind Demonstration Turbine with associated infrastructure. A Series of geotechnical, geophysical and benthic surveys have been undertaken by Forthwind limited to understand the seabed conditions from the turbine location back to site. The information is being factored into the project design to define the exact cable route from the turbine to the onshore landing point at the Fife Energy Park.

The final location and layout of the cable presented in Figure 1.1 is subject to possible further minor route refinement ('micro-siting') following analysis of the data being collected and as the design moves forward. Micro-siting would be undertaken to route around any newly identified constraints and would not constitute a significant change to this PEMP.

**Figure 1.1 - The Forthwind Project location**



**2.1. Development Programme Milestones**

It is anticipated that offshore construction will take approximately three months, across a period of approximately six months. After the construction period the turbine will undergo testing and commissioning before becoming operational. The Proposed Development will be operational for 25 years from final commissioning.

The current understanding of the programme is provided in Chapter 3, Section 3.6 of the Forthwind Environmental Impact Assessment Report (EIAR). Further detail of the timings and durations of the construction programme will be provided following the issuance of the Decion 36 and Marine Licence by Marine Scotland.

### 3. PEMP ROLES AND RESPONSIBILITIES

#### 3.1. Forthwind Project Manager

The Forthwind Project Manager will retain overall responsibility for ensuring that this PEMP is implemented and abided by Forthwind staff and contractors. The Project Manager has specific responsibility for ensure that sufficient resources are available to ensure the successful implementation of this PEMP.

#### 3.2. Forthwind Environmental Clerk of Works

The Forthwind Environmental Clerk of Works (ECOW) will have overall responsibility for the following:

- Ensure that the PEMP is prepared and implemented in compliance with consent conditions and other relevant Forthwind Consent Plans.
- Monitor and report on compliance with the PEMP to the MS-LOT as part of their regular compliance reporting, as detailed in the EMP. Maintaining and updating the PEMP document, in consultation with and as required by the relevant authorities.
- Requiring that all environmental monitoring or specialist studies required under the PEMP are undertaken at the appropriate time.
- Reviewing the monitoring reports and submitting the reports to Marine Scotland; and
- Liaising with the relevant consultees on matters related to this PEMP.

#### 3.3. Key Contractors and Subcontractors

Environmental monitoring will be undertaken throughout all phases of the Development. Whilst key contractors and subcontractors undertaking construction of the Development, and contractors with Operation and Maintenance (O&M) responsibilities, will not be involved in undertaking environmental monitoring, conditions of their contracts will require that they facilitate Forthwind's compliance with the PEMP.

### 4. FORTHWIND BIRD MONITORING PROGRAMME

#### 4.1. Approach to Bird Monitoring

It is proposed that pre- and post-construction monitoring is undertaken using shore based Vantage Point (VP) surveys. It is intended that the design of the surveys will be agreed in collaboration with NatureScot and Marine Scotland Science. It is proposed initially that the surveys should be:

- Undertaken from a coastal VP more than 2 km from the proposed turbine location.
- VP based on original baseline survey location (elevated position on a low hill on Fife Energy Park) which encompasses the turbine location plus a 500m buffer area.
- Surveys to be conducted by an experienced surveyor, using a telescope with a 60x magnification (acknowledged to enable reliable identification of species to between 3 and 4km from the observer (WeBS, 2012).
- Surveys to occur once per month, over a period of 1 year. Each survey will be for a minimum of 6 hours in blocks of a maximum of 3 hours to avoid observer fatigue.
- Flight height bands to be agreed.
- Survey area defined by a 70 degree arc of view looking south from the VP across a band of water located between 680m and 2,200m offshore – encompassing a total area of 2.52 km<sup>2</sup>.
- Records of glare conditions and sea state recorded every 30 minutes (at same interval as birds on the water are recorded).
- Gannets and gulls to be recorded using the secondary species method (5-minute sampling to record minimum numbers of birds attributable to flight activity) to simplify the field recording of these species.
- At least one full over-wintering period pre-construction survey should be undertaken.
- The VP surveys should continue for a full 12 months (one per month) following the installation and commissioning of the Proposed Development.

Other aspects that Forthwind wish to discuss and explore with NatureScot and Marine Scotland Science include the use of drones and whether there is merit in incorporating a control site for the planned surveys. It is

anticipated that these discussions will be undertaken following the issuance of a Marine Licence and Section 36 consent.

#### **4.2. Reporting**

It is proposed that Forthwind submits survey reports and raw data to MS-LOT within three months of receiving the data from survey contractors or equivalent.

It is also proposed that meetings should be held with NatureScot and Marine Scotland Science before iterations to PEMP are due to review any available data and agree any amendments to the strategy.

### **5. MARINE MAMMAL MONITORING**

Forthwind had previously engaged with Marine Scotland and NatureScot (then SNH) on the requirements for Marine Mammal monitoring for drill piling. In their response to consultation on the proposed Forthwind Construction Plan (27 February 2018), NatureScot responded:

*“With regard to the consideration of impacts on marine mammals, we consider that the noise estimates are appropriate. The supporting information on piling demonstrates that drilling will be quieter than impact piling. Generally, there is very little information available on noise levels generated from drilling, but the few measurements that have been done indicate that the noise will not be at a level to cause injury. The noise levels generated by drilling will be similar to louder vessels. We advise that the noise levels predicted in this document, for the short durations indicated, would only have short-term, localised disturbance impacts, at worst at any time of year for cetaceans.”*

As such Forthwind intend to proceed with the same approach in employing a Marine Mammal Observer (MMO) to ensure a record of any sightings of marine mammals is captured and maintain a record of the action taken to avoid any disturbance being caused to marine mammals during pre-construction and geophysical surveys and construction activities.

#### **5.1. Marine Mammal Observer (MMO) and MMO Protocol**

A MMO protocol (FW1.PRC.0001) will be agreed with Marine Scotland and used to ensure compliance with the requirements of the Section 36 consent and Marine Licence. The protocol (provided as a separate document) details the responsibilities, arrangements and procedures for ensuring that a MMO is present, the presence and behaviour of marine mammals in the vicinity is recorded and mitigation of potential impacts to marine mammals is implemented during noisy piling operations. Forthwind will confirm the appointment of a MMO prior to the commencement of the offshore works.



F O R T H W I N D

**OFFSHORE WRITTEN SCHEME OF INVESTIGATION  
(WSI) AND PROTOCOL FOR ARCHAEOLOGICAL  
DISCOVERIES (PAD)**

**FW1.PRC.0002**

Confidentiality Status: For Public Consultation

SIGNATURES					
Rev	Date	Purpose of Issue	Prepared by	Checked by	Approved by
A1	26/04/2022	For Consultation	M Murray	G Lee	M Murray

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## 1. PURPOSE

This procedure has been developed to protect archaeological assets and to ensure the appropriate recording and reporting of unplanned archaeological discoveries that may occur within the Forthwind Project. It has been developed to be compliant with guidance provided by the Crown Estate<sup>1</sup> and will be updated to satisfy the requirements of the Forthwind Section 36 consent and Marine Licence should it be required.

## 2. SCOPE

This Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) is specific to archaeology interests and is applicable to all Forthwind activities where archaeological information may be obtained, including surveys, installation activities and Operation and Maintenance (O&M) activities.

This procedure is intended to inform project personnel and contractors and will be made available to all staff and contractors undertaking offshore operations. The Forthwind project will require compliance by Contractors through condition of contract and by an appropriate auditing process. Compliance with this procedure will be monitored by the project Environmental Clerk of Works (ECoW) and the Forthwind Project Manager (PM).

This procedure will be in place for the life of the Proposed Development and will be updated when required should relevant changes to the project design, changes to the understanding of the archaeological baseline or details within the document change, for example contact details for key stakeholders.

### 2.1. Project Overview

The Proposed Development is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). The Proposed Development Footprint Envelope consists of the following:

- A single turbine and sub-structure (foundation and tubular jacket) located at British National Grid reference (BNG) 337812, 697333. A 100 m micro-siting allowance from the centre point for the turbine and associated infrastructure is required for the final selection of turbine location.
- An electricity export cable corridor, within which cable will be laid in a trench measuring approximately 1500 m in length. This will contain the cable that transmits the electricity generated by the turbine to the onshore transformer.
- A metmast and sub-structure comprising a lattice steel tower located at NGR 337314, 696959. A 100 m micro-siting allowance from the centre point for the metmast and associated infrastructure is required for the final selection of metmast location.
- A communications cable approximately 625 m in length, comprising a 20 mm<sup>2</sup> fibre optic cable, running alongside a power cable will be located between the turbine and the metmast.

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<sup>1</sup> Wessex Archaeology (2014) "Protocol for Archaeological Discoveries: Offshore Renewables Projects", The Crown Estate; available from: [03-PAD Offshore Renewables Crown Estate \(wessexarch.co.uk\)](https://www.wessexarch.co.uk/03-PAD-Offshore-Renewables-Crown-Estate); and Wessex Archaeology (2021) "Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects", The Crown Estate; available from: [guide-to-archaeological-requirements-for-offshore-wind.pdf \(thecrownestate.co.uk\)](https://www.thecrownestate.co.uk/guide-to-archaeological-requirements-for-offshore-wind.pdf)

Details of the locations of the turbine and metmast are included within Table 2.1 below:

**Table 2.1- Turbine and Meteorological Mast Location Coordinates - British National Grid**

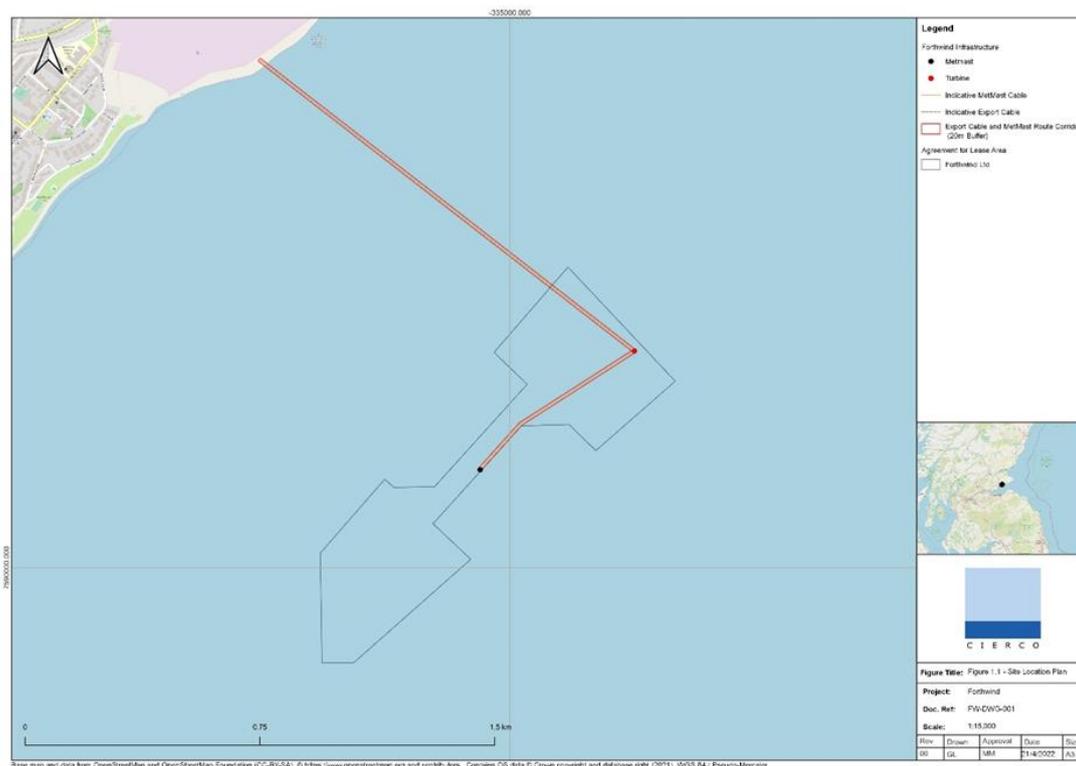
	Easting	Northing
Turbine	337812	697333
Meteorological Mast	337314	696959

A Series of geotechnical, geophysical and benthic surveys have been undertaken by Forthwind limited to understand the seabed conditions from the turbine location back to site. The information is being factored into the project design to define the exact cable route from the turbine to the onshore landing point at the Fife Energy Park.

The final location and layout of the cable presented in Figure 2.1 is subject to possible further minor route refinement ('micro-siting') following analysis of the data being collected and as the design moves forward. Micro-siting would be undertaken to route around any newly identified constraints and would not constitute a significant change to this WSI & PAD.

It is anticipated that offshore construction will take approximately three months, across a period of approximately six months. After the construction period the turbine will undergo testing and commissioning before becoming operational. The Proposed Development will be operational for 25 years from final commissioning.

**Figure 2.1 - The Forthwind Project location**

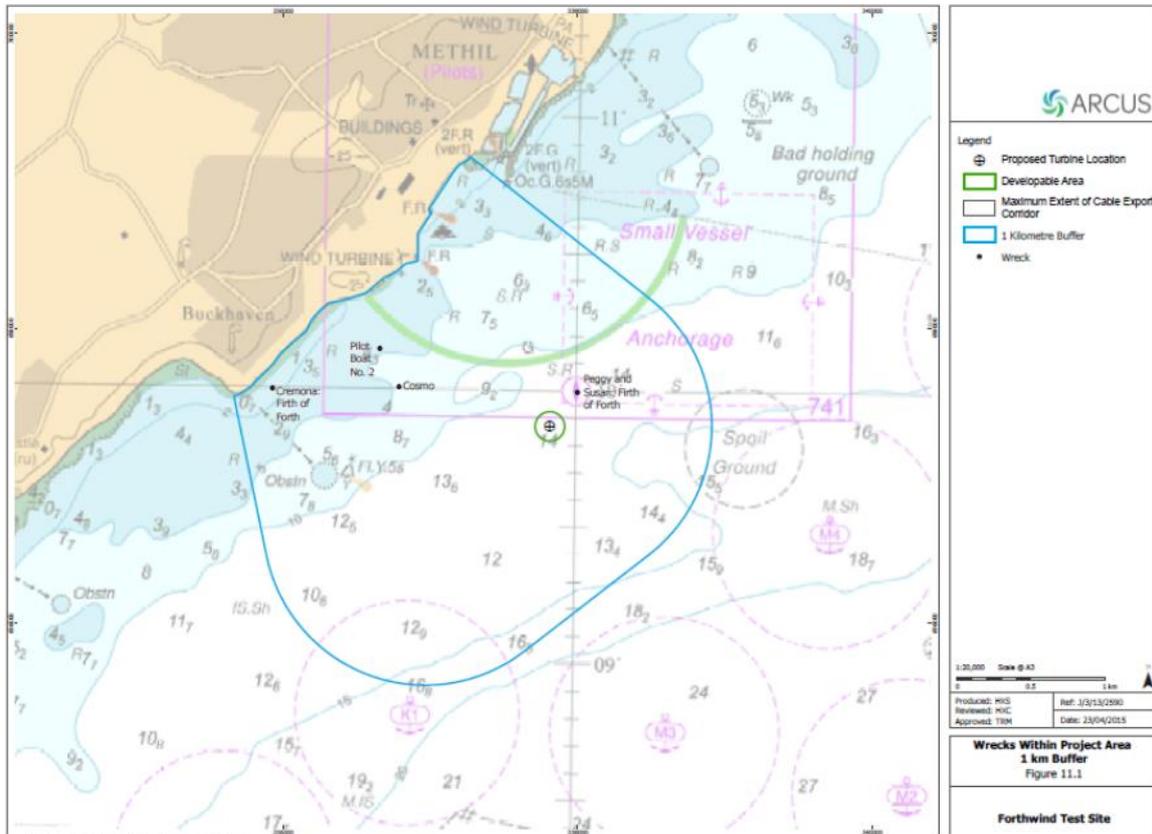


**2.2. Recorded Sites of Archaeology near the Forthwind Sites**

Four sites are recorded on the National Monuments Record of Scotland (NMRS) held by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) including maritime losses within 2 km of the Forthwind site (the Cosmos, the Cremona, Peggy and Susan and a Pilot Boat). There is no evidence for them found in the geophysical data gathered from previous surveys and for

each record the position is listed as 'arbitrary'. It is unlikely that the sites exist within 2km of the Forthwind site.

Figure 2.2 - Recorded Wrecks within 1km of the Forthwind Site



Based on the NMRS, RCAHMS and survey information undertaken to date, it is concluded that there are no known assets of archaeological value existing within the Forthwind project area. However, to mitigate the risk of damage to any previously unrecorded archaeological remains this WSI and PAD has been prepared to mitigate construction, operation and decommissioning impacts in the event of any unexpected archaeological discoveries during works.

**3. ROLES AND RESPONSIBILITIES**

The following provides an interim overview of the roles and responsibilities of the Forthwind Project:

**3.1. Forthwind Project Manager**

The Forthwind Project Manager will retain overall responsibility for ensuring that the WSI and PAD is implemented and abided by. Specifically, the Forthwind Project Manager will be responsible for:

- Ensuring that the Forthwind agents and contractors are contractually bound to adhere to the terms of the WSI and to implement the PAD.
- interaction with third parties with archaeological interest, and the Archaeological Curator(s).
- Ensure that the WSI and PAD is implemented during the lifetime of Forthwind.
- Seeking curatorial advice from Historic Environment Scotland (HES), Marine Scotland (MS-LOT) and Fife Council when appropriate.

**3.2. Forthwind Client Representative**

Forthwind will identify a Client Representative to act as a first point of contact for Project staff. It will be the responsibility of the Client Representative to:

- liaise with the Environmental Clerk of Works (ECoW) in respect of the implementation of mitigation measures with respect to archaeology and cultural heritage.
- To cease all construction activities temporarily (in the vicinity of the location), or move to an alternate location, until the advice of the ECoW and Forthwind Project Manager has been obtained.

### **3.3. Environmental Clerk of Works (ECoW)**

The ECoW is an independent representative who will be responsible for the liaison with the Client Representative. The ECoW will be familiar with the requirements set out in the WSI and PAD and will provide oversight that agreed mitigation and reporting protocols are being followed. The ECoW will ensure that all Forthwind staff and contractors working offshore have undertaken an Awareness Programme to ensure familiarity of the WSI and PAD arrangements.

In the event of the discovery of unexpected, unusual or extremely fragile and delicate objects and deposits, the ECoW is responsible for notifying the Retained Archaeologist immediately.

### **3.4. Retained Archaeologist**

Following the granting of the Section 36 and Marine Licence, Forthwind will commission a Retained Archaeologist during the project construction and Operation and Maintenance (O&M) phases. The Retained Archaeologist will oversee archaeological mitigation and be the initial point of contact for the ECoW. The Retained Archaeologist will report to the Forthwind Project Manager and will be responsible for:

- Maintaining, reviewing and updating this WSI, as required.
- Advising Forthwind which elements warrant archaeological involvement.
- Advising Forthwind on the necessary interaction with third parties with archaeological interests.
- In the event of the discovery of items that may be eligible for legal protection, the Retained Archaeologist will notify the relevant legal authority as soon as possible.
- Advising Forthwind on the implementation of generic archaeological requirements applicable to all construction and operational activities.
- Advising Forthwind on Method Statements for archaeological investigations should it be required.
- Preparing detailed Method Statements for all archaeological activities should it be required.

### **3.5. Forthwind Staff and Contractors**

All Forthwind staff and contractors involved in offshore operations will:

- Familiarise themselves with the generic requirements of the WSI make them available to their staff.
- Obey legal obligations in respect of 'wreck' and 'treasure' under the Merchant Shipping Act 1995 and the Treasure Act 1996 respectively.

The Protocol is supported by an Awareness Programme to ensure familiarity of the WSI and PAD arrangements.

#### **4. POTENTIAL IMPACTS**

As stated previously it is concluded that there are no known assets of archaeological value existing within the Forthwind project area. However, should there be undiscovered archaeological assets exist in the area the potential impacts could potentially be caused through:

##### **4.1. Potential Direct Impact**

Direct impacts may arise from both direct damage to archaeological deposits and material and the disturbance or destruction of relationships between deposits and material and their wider surroundings. Potential direct impacts during construction could arise from damage, disturbance or destruction to submerged prehistoric archaeology, shipwrecks and crashed aircraft from:

- Installation of pile foundations;
- Placing of scour and/or cable protection (if required);
- Installation of inter-array, interconnector and export cabling; and,
- Vessel interaction with the seabed (e.g. legs of jack-up vessels and/or anchors of other vessels).

Potential direct impacts during operations comprise of damage, disturbance or destruction of the fabric or setting of submerged prehistoric archaeology, shipwrecks and crashed aircraft from anchors of vessels (jack-up barges) being deployed for scheduled and unscheduled maintenance.

Predicted direct impacts during decommissioning could comprise of damage, disturbance or destruction of the fabric or setting to submerged prehistoric archaeology, shipwrecks and crashed aircraft from the removal of seabed infrastructure and from the legs of jack-up vessels and/or anchors of other vessels.

No mitigation for direct impacts is provided in this WSI, as the potential for direct physical impact are judged as negligible.

##### **4.2. Potential Indirect Impacts**

Indirect impacts can include changes to water quality, currents, sediment transport and erosion patterns during installation of the turbine and met mast foundation and cables. Possible indirect impacts comprise:

- Increased erosion to submerged prehistoric archaeology, shipwrecks and crashed aircraft uncovered as a result of changes in scour or sedimentation; and
- Increased protection afforded to submerged prehistoric archaeology, shipwrecks and crashed aircraft buried as a result of changes in scour or sedimentation.

No mitigation of indirect impacts is provided for in this WSI, as the potential for indirect physical impacts are judged to be negligible.

#### **5. PROCEDURE**

In the event of unexpectedly encountering an archaeology asset during the course of the construction, operation or decommissioning of the Project will be addressed by the implementation of the Protocol for Archaeological Discoveries. The PAD has been developed following a process identified by Wessex Archaeology on behalf of the Crown Estate specifically for offshore renewables development projects.

The aim of PAD is to reduce any adverse effects of the development on the historic environment, by enabling people working on the development to report archaeological discoveries in a manner that is both convenient to their everyday work and effective with regard to curatorial requirements.

The protocol anticipates discoveries being made by staff, who report to the Client Representative, who then reports to the ECoW (to be appointed) and the Forthwind Project Manager to co-ordinate implementation of the protocol.

Until the appointment of the ECoW, the interim Forthwind nominated contacts are:

**Gemma Lee** Forthwind Project Manager.

Cierco Energy, The Boathouse, Hawkcraig Road, Aberdour, KY3 0TZ. Tel: 01383 662 160; email: gemma.lee@ciercoenergy.com

**Marc Murray** Cierco Projects Director.

Cierco Energy, The Boathouse, Hawkcraig Road, Aberdour, KY3 0TZ. Tel: 01383 662 163; email: marc.murray@ciercoenergy.com

### 5.1. Ordinance

Offshore surveys undertaken to date have not identified any Unexploded Ordnance (UXO) in the area. However, a UXO survey will be undertaken over the offshore construction area prior to installation activities commencing. Where ordnance is concerned, specific rules are in place by the Forthwind **[to be included following development]**. These rules are required for the safe conduct of construction and installation operations, and must take precedence over this Protocol. Historic ordnance may, however, also be of archaeological interest and can be reported under this Protocol once the rules for ordnance have been satisfied.

### 5.2. Human Remains

In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending the Retained Archaeologist approaching the relevant authorities. Where practical the human remains will be left in situ, covered and protected.

The Retained Archaeologist will inform the Forthwind Project Manager who will immediately inform the local Police and the Procurator Fiscals office in Kirkcaldy.

Pending discussions regarding the need for excavation/removal or sampling, between the Retained Archaeologist, the Forthwind Project Team, and the Archaeological Curator), where this is deemed appropriate, as the remains cannot be left in situ, the human remains will be fully recorded, excavated, and removed from site in compliance with the relevant licence.

All archaeological work should be in accordance with established protocols and undertaken in line with ClfA standards (McKinley and Roberts, 1993). Appropriate guidance will be sought from a suitably qualified and experienced osteoarchaeologist, if required.

The final deposition of human remains after the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the Ministry of Justice licence.

Material recovered below Mean High Water Springs to 12nm may be regarded as Wreck under the Merchant Shipping Act 1996.

### 5.3. Wrecks

Archaeological artefacts that have come from a ship are 'wreck' for the purposes of the Merchant Shipping Act 1995. The Client, via the Retained Archaeologist, should ensure that the Receiver of Wreck is notified within 28 days of recovery, for all items of wreck that have been recovered.

## 6. PROTOCOL FOR ARCHAEOLOGICAL DISCOVERIES (PAD)

This section presents the sequence and actions by staff the event of unexpectedly encountering an archaeology asset during the course of the construction, operation or decommissioning of the Project.

### 6.1. Actions by Staff

#### 6.1.1. *Applicable to all finds*

If a find of archaeological interest is made, Project Staff will immediately inform the Client Representative (via their supervisor if appropriate).

If the discovery is ordnance, then Project Staff will abide by their operational procedures which are to take precedence; and then report via the Protocol once safe to do so.

Where items of archaeological interest are recovered, Project Staff (under direction of the Client Representative) will:

- Handle all material with care.
- Any rust, sediment, concretion or marine growth should not be removed and 'groups' of items or sediments should not be separated.
- If possible, photograph the item in the condition in which it was recovered.
- Record the position at which the artefact/sediments were recovered.
- Label artefact appropriately and add the unique ID when provided by the Implementation Service.

If the find is from a waterlogged or underwater environment, then Project Staff (under direction of the Client Representative) will arrange for the find to be immersed in seawater in a suitable clean container, which should be covered.

#### 6.1.2. *Discoveries on Board*

If a find of archaeological interest is made on board a construction vessel (for instance, caught in a grapnel/anchor or trapped in a plough), Project Staff will immediately inform the Client Representative. The Client Representative will inform the ECoW.

Where it is possible to identify the seabed position from which the find originated, the Client Representative will temporarily cease construction activities in the vicinity of the seabed location, or move to an alternate location, until the advice of the Retained Archaeologist has been obtained.

#### 6.1.3. *Anomalies on the Seabed*

Finds or sites of archaeological potential may be encountered via a number of methods including geophysical survey, magnetometer, obstacle avoidance sonar, and interaction with ploughs, anchors, or jack-up legs. Staff should be constantly aware of the possibility of archaeological discoveries.

If an anomaly is identified in advance of impact, such as on the forward-looking sonar of a cable plough, the route should – where possible – be deviated around the obstruction, in line with normal ploughing practice. The position of the anomaly will be reported to the Client Representative and thence to the ECoW.

If an anomaly is identified after an impact has occurred, for example, as indicated by a change in the towing cable tensiometer, avoidance by deviation will be precluded. However, the change in tension should be immediately brought to the attention of the Client Representative and the ECoW so that the anomaly can be reported, advice can be sought and any requirements for further investigation determined.

The Client Representative will arrange for the grapnel or plough to be recovered to the surface and examined as soon as possible, once recovered to surface, to see if any archaeological material is trapped within it, and will inform the ECoW accordingly.

If an anomaly comes to light in the course of geophysical survey or drop-down video survey the Client Representative will ensure that the position of the anomaly is noted on navigational software and that the ECoW is informed.

#### *6.1.4. Discoveries on Land or in Inter-tidal Areas*

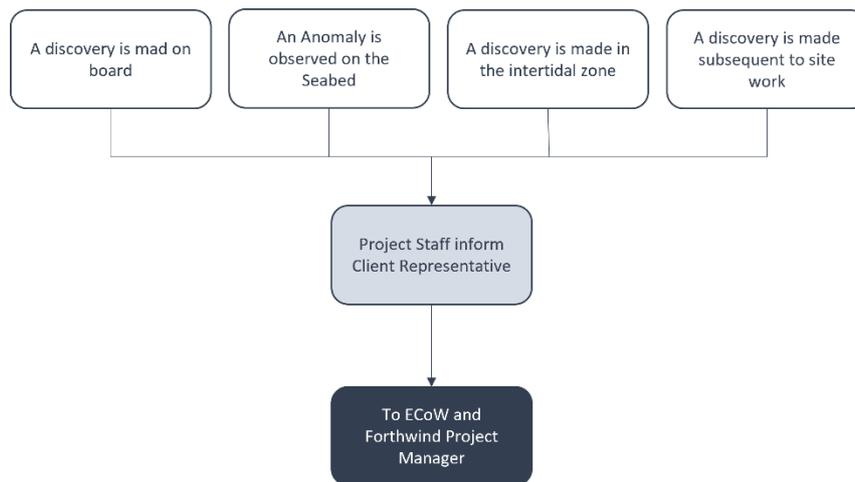
Discoveries may be made in the course of groundworks, trenching or site investigations. They should be reported to the ECoW and the finds handled in accordance with the general guidance above. Where archaeological investigations are already taking place, as part of a watching brief, evaluation trenching, or open area investigation, then the method statement for those investigations will take precedence and discoveries need not be reported under this Protocol.

#### *6.1.5. Discoveries Subsequent to Work on Site*

There are a number of circumstances in which the presence of material of archaeological interest may be identified after work on site has occurred. For example, Project Staff reviewing geophysical data or video might observe an anomaly. Similarly, Project Staff involved in processing samples in the laboratory may make archaeological discoveries in their samples.

Staff examining sample material (e.g., core material; benthic samples) should consider the potential for archaeological and/or paleoenvironmental material being recovered within their samples. Where such discoveries are made Project Staff should inform the ECoW and pass on details of the sample number and its position.

If an anomaly comes to light in the course of processing or interpreting geophysical survey data, video or other photographic data, Project Staff should inform the ECoW and pass on details of the data files and navigational information relating to the positions where the data were obtained.

**Figure 6.1 - Actions by Project Staff when encountering suspected archaeology asset**

## 6.2. Actions by the Client Representative

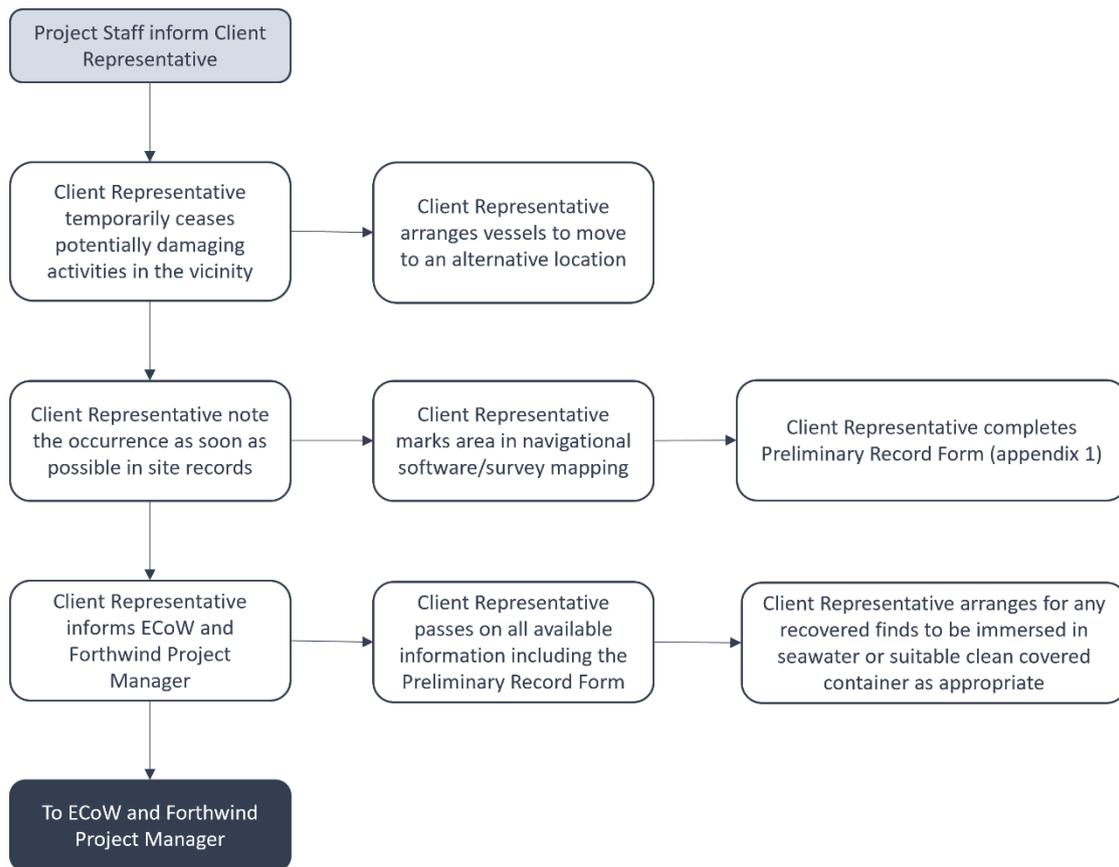
Where it is possible to identify the position from which the discovery originated, the Client Representative will arrange for construction activities to cease temporarily (in the vicinity of the location), or move to an alternate location, until the advice of the Retained Archaeologist has been obtained.

The Client Representative will note the occurrence as soon as possible in the site daybook or vessel log together with the time and exact position. The entry should include a close approximation of the original position of the find/anomaly. Additionally, the area should be marked on site drawings or surveys.

The Client Representative will complete the Preliminary Record Form (Appendix I) of the occurrence. The Client Representative will inform the ECoW and the Forthwind Project Manager of the occurrence as soon as possible and pass on all available information, including a copy of the Preliminary Record and copies of any photographs, drawings or other records that have been made.

The Client Representative will arrange for any finds (of archaeological material) to be carefully contained and protected:

- if waterlogged: immersed, bagged and placed in a protective container, or placed in seawater in a suitable clean container, which should be covered and stored in a cool, dark place.
- if dry: placed in a suitable container and stored in a cool, dark place.
- any dirt, rust, concretion or marine growth should not be removed.

**Figure 6.2 - Actions by the Client Representative when encountering suspected archaeology asset**

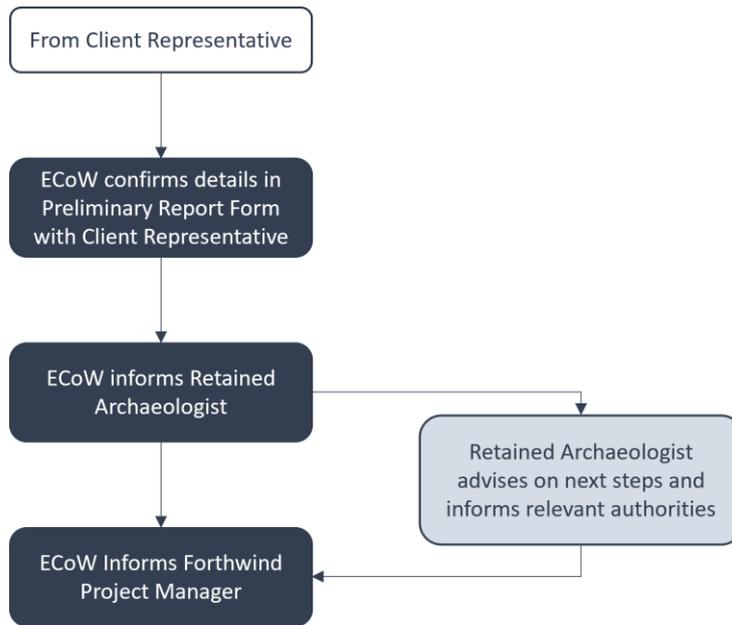
### 6.3. Actions by the Environmental Clerk of Works

The ECoW will confirm with the Client Representative that all the details set out in the Preliminary Record are comprehensive and correct.

The ECoW will contact the Retained Archaeologist at the earliest opportunity, to seek advice on the appropriate immediate actions in addition to the recording, handling and storage of any items recovered.

The ECoW will pass on to the Retained Archaeologist all the available information relating to the circumstances of the occurrence, including a copy of the Preliminary Record and copies of any other records that have been made.

The ECoW will inform the Forthwind Project Manager.



**APPENDIX 1 – PRELIMINARY RECORD FORM**

<b>FORTHWIND PROTOCOL FOR ARCHAEOLOGICAL DISCOVERIES (PAD) - PRELIMINARY RECORD FORM</b>	
<i>Discoveries on the Seabed / on board / in the inter-tidal zone / on land</i>	
Vessel Name:	
Date:	
Site:	
Time of Compiling Information:	
Name of Compiler (Client Rep):	
Name of Finder (if different to above):	

Time at which discovery was encountered:	
Vessel position at time when anomaly was encountered:	
a) Latitude:	
b) Longitude:	
c) Datum (if different to WGS84):	
Original position of the anomaly on the seabed, if known:	
Notes on likely accuracy of original position stated above:	
a) How accurate is the position?	
b) Is the position the original position or has the material been moved by operations?	
c) Details of any circumstances and activity that lead to the discovery	

<b>FORTHWIND PROTOCOL FOR ARCHAEOLOGICAL DISCOVERIES (PAD) - PRELIMINARY RECORD FORM</b> <small>Discoveries on the Seabed / on board / in the inter-tidal zone / on land</small>	
Description of the find/anomaly:	
Apparent size / extent of the anomaly:	
Details of any find(s) recovered:	
Details of photographs, drawings or other records made of the find(s) (e.g. location figure):	
Details of treatment or storage of the find(s):	
Date and time nominated contact informed:	
General Notes:	
If discovered on the seabed:	
a) Derived from: (e.g. Obstacle Avoidance Sonar, Cable Tensiometer?)	
b) Apparent size / extent of anomaly (length, width, height above seabed)?	
c) Extent of deviation / route development	

**FORTHWIND PROTOCOL FOR ARCHAEOLOGICAL DISCOVERIES (PAD) - PRELIMINARY RECORD FORM**

Discoveries on the Seabed / on board / in the inter-tidal zone / on land

Signed:

Date:



F O R T H W I N D

## FORTHWIND DEMONSTRATION PROJECT

### ACCIDENT AND INCIDENT REPORTING PROCEDURE

**FW1.PRC.03**

**Confidentiality Status: Commercial**

<b>SIGNATURES</b>					
<b>Rev</b>	<b>Date</b>	<b>Purpose of Issue</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>
A1	28/04/2022	For Consultation	M Murray	G Lee	M Murray
A1	17/01/2018	For Consultation	M Murray	M Keja	M Jakobsson

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## 1. PURPOSE

This document forms the Forthwind Demonstration Project procedure for the key steps of reporting, investigation and follow-up in the event of an accident or incident arising from areas of community, health, safety, environment and security. It also details the procedure that employees and contractors should follow if they should observe a dangerous or unsafe situation, providing them with a method of recording the situation and bringing it to the attention of Forthwind's management.

## 2. SCOPE

This procedure shall be used at all worksites and areas of operation managed by Forthwind and in workplaces which are not under the direct control of Forthwind but where company staff may be undertaking work.

## 3. DEFINITIONS

**Accident:** Undesired and unplanned events which may cause personal injury, damage to property or equipment, or loss of output, or all three.

**Incident:** These are events or situations that could harm employees at work in such a way that there is a legal requirement to report them. If something happens which does not result in a major injury, but clearly could have done, it may be classed as an incident.

**Environmental Incident** These are events or situations that could harm the environment in such a way that there is a legal requirement under the Forthwind Marine Licence or Section 36 consent to report them. Environmental incidents include, but are not limited to, Force Majeure deposits on the seabed, release of unauthorised pollutant materials or failure to comply with a condition of either the Forthwind Marine Licence or Section 36 consent.

**Hazard:** This is a situation with the potential to cause harm or danger.

**Near Miss:** This is an unplanned event that did not result in injury, illness or damage – but had the potential to do so.

**UNOR:** Unusual Occurrence Reporting Card

## 4. ACCIDENT INVESTIGATION

### 4.1. Why should incidents be investigated?

To establish the initial & underlying (root) causes; to allow action to be taken to prevent the incidents recurring; to produce information to allow analysis of trends & patterns; to prioritise any required action; to prevent accidents, ill-health & other losses; to assist in defending criminal prosecutions & civil claims.

### 4.2. What should be included in an incident investigation report?

Details of what happened, to whom (or what) & when, and of any injuries or ill-health sustained; identification of the immediate & underlying causes; recommendations for action required to prevent further occurrences. Can include supporting information e.g. interview transcripts; statements from witnesses; plans; photos; relevant records; checklists.

### 4.3. What are the UK legal reporting requirements for major injuries, diseases, over 3 day injuries & dangerous occurrences?

**Major injury:** Responsible Person to report to enforcing authority immediately by quickest means practicable; follow with a written report on form F2508 (<https://extranet.hse.gov.uk/lfservlet/external/F2508IE>) within 7 days.

<b>Diseases:</b>	Responsible Person to report to enforcing authority in writing on form F2508A ( <a href="https://extranet.hse.gov.uk/lfserver/external/F2508A">https://extranet.hse.gov.uk/lfserver/external/F2508A</a> ). This requires a medical diagnosis first.
<b>Over 3 day injuries:</b>	Responsible Person to report to enforcing authority in writing on form F2508 ( <a href="https://extranet.hse.gov.uk/lfserver/external/F2508DOE">https://extranet.hse.gov.uk/lfserver/external/F2508DOE</a> ) within 10 days of the accident. Do not count the day of the accident.
<b>Dangerous Occurrences:</b>	Responsible Person to report to enforcing authority immediately by quickest means practicable; follow with a written report on form F2508 ( <a href="https://extranet.hse.gov.uk/lfserver/external/F2508IE">https://extranet.hse.gov.uk/lfserver/external/F2508IE</a> ) within 7 days.

#### 4.4. What are the legal requirements for reporting of 'environmental incidents'?

The Forthwind Section 36 consent and Marine Licence require Forthwind to:

- a) Provide Marine Scotland Licencing and Operations Team ([MS.MarineRenewables@gov.scot](mailto:MS.MarineRenewables@gov.scot)) with written notification of a breach of any health and safety or environmental obligations relating to the Forthwind development within 24 hours of the incident occurring. The notification must include the nature and timing of the incident to the Scottish Ministers, including confirmation of remedial measure taken and/or to be taken to rectify the breach.
- b) Provide Marine Scotland Licencing and Operations Team ([MS.MarineRenewables@gov.scot](mailto:MS.MarineRenewables@gov.scot)) with written notification within 48 hours should Forthwind or its contractors by any reason of force majeure deposit anywhere in the marine environment any substance or object. The report should contain full details of the circumstances and nature of the deposit.

#### 4.5. How can information on accidents & incidents be used within an organisation?

To provide information to be used in the review of the relevant risk assessments; to prevent further accidents, property damage & ill-health; to provide data for reactive monitoring; to provide data to contribute to benchmarking; to inform management of current situation on QHSE; to provide information on the adequacy of current controls; to provide information on the effectiveness of health surveillance; to contribute to the review of the QHSE management system.

## 5. REPORTING THE ACCIDENT OR INCIDENT

All accidents and incidents shall be promptly reported to the Project Manager and Project Director (PD) by the fastest available means. This shall immediately be followed by completion of an initial report by the observer and reporter of the incident which will be sent on the PD for investigation.

The initial report shall contain, as a minimum, the following information:

- Date/Time of accident
- Nature of accident
- Place
- Exact location
- Brief description of what happened
- Injury (if any)
- Name of involved person(s)
- Equipment damaged
- Classification of accident or incident (if known)
- Remedial action taken
- Further action required

A Spill / incident report form is provided in Appendix 1 to assist with the reporting of potential environmental incidents.

Appendix 2 provide a list of contacts who may need to be contacted in case of emergency.

## 6. INVESTIGATION

An investigation to determine the immediate causes of an accident or incident provides the key to prevent a re-occurrence. It may reveal failures or absence of management systems which when corrected may help our objective to prevent further accidents and incidents.

Severity (actual or potential) of the effect of an accident or incident shall determine the level and depth of investigation. This decision will usually be taken by the PD.

The investigation will start immediately, led by PD (or appointed nominee), with the support of the observer(s) and reporter of the event. In the unlikely event of fatalities or serious occurrence, the Forthwind Project Chair will jointly lead the investigation.

The formal report, prepared by the PD (or appointed nominee), of an investigation must be ready for management review within seven days of the occurrence.

## 7. FOLLOW UP

Follow-up is an action which ensures that recommendations from an accident/incident investigation are implemented. The report of an investigation is not complete unless the recommendations to prevent recurrence have been identified. Recurrence cannot be prevented by mere recommendations, these must be implemented.

Actions from an accident or incident must be closed out within 30 days.

## 8. RECORDING

The PD collates all the information from the accident and incident reports where this information is analysed to identify root and basic causes. Any findings from the analysis are then submitted to the CEO for his review and presentation to the Board of Directors.

Lessons learned are also identified, recorded and communicated. They are then used to put relevant improvement in place.

## 9. COMMUNICATION

All new employees and contractors are given a QHSE overview on their first day which includes:

- Emergency actions for fire, first aid/medical treatment;
- Accident/incident reporting requirements;
- Hazard identification and reporting;
- Location of the QHSE Management system procedures and forms.

Every employee and contractor receives a full company induction within their first week of employment. In addition to this, any updates or developments are presented at Staff Updates.

**APPENDIX 1 - SPILL / INCIDENT REPORT FORM**

Site: Primary Contractor:

Date: Incident Date:

Complete for any type of petroleum product or hazardous materials / waste spill or incident.

Person Reporting Spill or Incident		Address	
Name:			
Organization:			
Title:			
Telephone:			
Fax:		Signature:	

Type of Spill:			
Common Name of Spilled Substance			
Estimated Quantity Spilled			
Estimated Concentration			
Date of Spill			
Time Spill Started :		AM / PM	Time Spill Ended
			AM / PM

SPILL TO LAND		SPILL TO WATER BODY	
Name of site:		Name of water body:	
Street address:		Location of discharge	
City:		Description of area from which spilled material may reach:	
County:			

**Spill or Incident Report Form (Page 2)**

If no spill describe incident:

**Actions Taken:**

To contain spill or impact of incident:

To clean up spill or recover from incident:

To remove clean-up material:

To Prevent reoccurrence:

Person responsible for managing spill response:	
Name	Signature
Phone	Fax

**Spill Reporting Information**

Where is the spill?	
What spilled?	
How much spilled?	
How concentrated is the spilled material?	
Who spilled the material?	
Is anyone cleaning up the spill?	
Are there resource damages (e.g. dead fish or oiled birds)?	
Who is reporting the spill?	
Your contact information	

## APPENDIX 2 - EMERGENCY NOTIFICATION LIST

Organisation	Telephone	Contact Name / Note
<b>Emergency Services (First Response)</b>	<b>999</b>	<b>Police, Ambulance, Coastguard, Fire Brigade, Lifeboat Service and Bomb Disposal</b>
Air Accident Investigation Branch	01252 512 299	24hr Reporting Line
BiFab, Methil	01592 226 610	General Contact Number
Civil Aviation Authority (CAA)	01293 567 171	General Contact Number
Fife Energy Park	0141 228 2000	Mr. Craig Watt
Scottish Fire and Rescue Service	01463 240 999	24hr Reporting Line
Forth Ports	01324 498 580 07753 775 378	Chief Harbour Master
Health and Safety Executive (HSE) - Incident Contact Centre	0345 300 9923	For fatal accidents or accidents resulting in specified injuries
HSE – Out of Hours Major Incident	0151 992 9235	Duty Officer
HSE – Advisory Team	0300 003 1747	General Contact Number
Hospital - Dundee Ninewells	01382 660 111	General Contact Number
Hospital - Dunfermline Queen Margaret	01383 623 623	General Contact Number
Hospital - Kirkcaldy	01592 643 355	General Contact Number
Marine Accident Investigation Branch (MAIB)	023 8023 2527	24hr Reporting Line
Marine and Coastguard Agency (MCA) - UK	02380 329 486	General Contact Number
MCA – Aberdeen Operations Centre	01224 592 334	General Contact Number
Marine Scotland - Incident Line	0300 244 4000	Duty Officer
NHS 24	111	24hr Advice Line
Northern Lighthouse Board	08000 326 655	Emergency Number
Police Scotland	101	General Contact Number
Scottish Water	0845 601 8855	24hr Reporting Line
SEPA - Glenrothes Office	01592 776 910	General Contact Number
SEPA - Pollution Hotline	0800 807 060	24hr Reporting Line

