# Appendix 2-8 Construction Environmental Management Plan

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# Scart Mountain Wind Farm, County Waterford

# Construction Environmental Management Plan (CEMP)

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# Scart Mountain Wind Farm

## Construction Environmental Management Plan (CEMP)

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| **Client Address:** | Dublin Road<br>Newtownmountkennedy,<br>Co. Wicklow,<br>A63 DN25 |
| **Project Number** | 11303 |
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## Acronyms and abbreviations

| Acronym | Term in Full |
|---|---|
| ABP | An Bord Pleanála |
| BS | British Standard |
| C&D | Construction and Demolition |
| CEMP | Construction Environmental Management Plan |
| CGBM | Cement Bound Granular Mixture |
| CIRIA | Construction Industry Research and Information Association |
| $CO_2$ | Carbon dioxide |
| DoHLGH | Department of Housing, Local Government and Heritage |
| ECoW | Ecological Clerk of Works |
| EIA | Environmental Impact Assessment |
| EIAR | Environmental Impact Assessment Report |
| EPA | Environmental Protection Agency |
| ERP | Emergency response plan |
| ESB | The Electricity Supply Board |
| EU | European Union |
| GCR | Grid connection route |
| GHG | Greenhouse Gas |
| GLA | Greater London Authority |
| ha | Hectares |
| HDD | Horizontal Directional Drilling |
| H&S | Health and safety |
| HAS | Health and Safety Authority |
| HGV | Heavy goods vehicle |
| IAPs | Invasive alien plants species |
| IEMA | Institute of Environmental Management |
| IFI | Inland Fisheries Ireland |
| km | Kilometres |
| kV | Kilovolts |
| m | metres |
| MW | Megawatt |
| NBDC | National Biodiversity Data Centre |

| | |
|---|---|
| NHA | Natural Heritage Area |
| NIS | Natura Impact Statement |
| NPWS | National Parks and Wildlife Service |
| NRA | National Roads Authority |
| OD | Ordnance Datum |
| pNHA | Proposed Natural Heritage Area |
| PPE | Personal Protective Equipment |
| PSCS | Project Supervisor Construction Stage |
| PSDP | Project Supervisor Design Process |
| SAC | Special Area of Conservation |
| SPA | Special Protected Area |
| SuDS | Sustainable Drainage Systems |
| SWMP | Surface Water Management Plan |
| TDR | Turbine delivery route |
| TII | Transport Infrastructure Ireland |
| TMO | Traffic Management Operative |
| TMP | Traffic Management Plan |
| UK | United Kingdom |
| WFD | Water Framework Directive |
| WMP | Waste Management Plan |
| ZoI | Zone of Influence |

# 1.0 INTRODUCTION

FuturEnergy Scart Mountain Designated Activity Company (hereafter referred to as the Applicant), have applied to An Bord Pleanála for planning permission to construct the proposed Scart Mountain Wind Farm in County Waterford. This document presents a Construction Environmental Management Plan (CEMP) setting out the principles and procedures for environmental management during construction of the proposed wind farm and associated works.

## 1.1 SITE LOCATION AND PROJECT DETAILS

The proposed wind farm site is located between Cappoquin, Bellinamult and Millstreet, in Co. Waterford. The site of the proposed wind farm is located approximately 4 km northeast of Cappoquin, and approximately 13 km northwest of Dungarvan.

The site of the proposed wind farm (Figure 1-2 of the Environmental Impact Assessment Report (EIAR)) has an area of approximately 981.4 ha and comprises an elongated land parcel approximately 8 km long in the north/south direction and is approximately 1.9 km wide in an east/west direction at the widest point. The site lies between the R671 and the R669, on the southeastern side of the Knockmealdown Mountains. The landscape is predominately hilly to mountainous in the wider area, with the proposed wind farm site being located on an elevated area beside the Glenshelane river valley with a topography of between 130m and 486 m Ordnance Datum (OD). The Knockmealdown Mountains to the north and northwest of the site are also elevated and are the most significant landscape features in the surrounding area.

Minor additional works such as hedgerow trimming and temporary demounting of some signage, etc. will also be required at various locations along the route to allow for delivery of oversize components to the site. Figure 2-1 below shows the location and extent of the proposed project.

## 1.2 BRIEF PROJECT DESCRIPTION

The proposed project comprises a wind farm of 15 no. wind turbines and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, proposed grid connection route (GCR) and works along the road network for the proposed turbine delivery route (TDR). It is proposed to supply the power from the Scart Mountain Wind Farm to the electricity network via 110kV underground cables (approximately 15.5 km cable length of which approximately 13.3 km of which is on the public road corridor) to the existing Dungarvan 110kV substation in the townland of Killadangan, Co. Waterford. The proposed project also comprises facilitating works on the public road network and at private properties to accommodate the delivery of turbine components.

The proposed project will have an electrical power output of between 5.7 – 7.2 MW. The minimum rated output of 5.7 MW and a maximum rated output of 7.2 MW has been used to calculate the power output of the proposed project, which will result in an estimated installed capacity of between 85.5 - 108 MW.

A full description of the proposed project is provided in Chapter 2 (Description of the Proposed project) of the Environmental Impact Assessment Report (EIAR).

## 1.3 OBJECTIVES OF THE CEMP

The objectives of the CEMP are to:

- Outline the proposed mechanisms for ensuring the delivery of environmental measures to avoid or reduce environmental effects identified.
- Ensure procedures are in place so that there is a prompt response to effects requiring remediation, including reporting and any additional mitigation measures required to prevent a recurrence.
- Provide an outline of the content that would be supplied in the construction method statements and strategies that would be prepared in order to secure mitigation measures in relation to different design aspects of the proposed development.
- Ensure compliance with legislation and identify where it would be necessary to obtain authorisation from relevant statutory bodies.
- Ensure that appropriate proposed development monitoring and reporting would be in place.
- Provide a framework for reporting, compliance auditing and inspection to ensure environmental aims would be met.
- Set out the client's expectations to guide contractors on their requirements with regards to environmental commitments and environmental management.

## 1.4 IMPLEMENTATION AND CONTROL

This CEMP will be clearly available and displayed in the site office for reference by anyone working on the site. The measures set out in this plan will form part of the site induction and will also be discussed with those working on site during informal 'toolbox' talks.

Where appropriate, the CEMP, or plans within the CEMP, will form part of the site induction which would be mandatory for all employees, contractors and visitors attending the site. All employees and contractors will need to familiarise themselves with the relevant contents of the CEMP and supporting appendices as directed.

Compliance with the CEMP is the key control measure required during construction to ensure mitigation is appropriately addressed. The Contractor would be required to prepare a series of site / task specific method statements providing detail on how the contractor intends to implement the mitigation set out in the CEMP.

The CEMP would be used by the Contractor to ensure appropriate environmental management is implemented throughout the construction phase of the proposed development. The CEMP documents the commitment to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts associated with the proposed development. The CEMP aims to define good practice as well as specific actions requited to implement mitigation requirements.

It is important to note that the CEMP is considered to be a live document that will continue to be developed further and / or amended throughout all phases in the lifetime of the proposed development.

In terms of overall environmental responsibility, everyone on site is responsible for ensuring that their actions constitute good environmental practice. All site personnel are charged with following good practice and encouraged to provide feedback and suggestions for improvements. All site personnel are also required to ensure compliance with the requirements of the CEMP.

Compliance with the CEMP, the procedures, work practices and controls will be mandatory and must be adhered to by the Contractor, all site personnel, and sub-contractors employed during the construction phase. The CEMP seeks to:

- Provide a basis for achieving and implementing the construction related mitigation measures identified in the EIAR and NIS; and
- Promote best environmental on-site practices for the duration of the construction phase.

### *1.4.1 Environmental Training and Awareness*

In order to ensure that environmental awareness and compliance is communicated effectively at the start and throughout the construction works, this CEMP and its contents will be communicated to all site personnel, including management staff, operatives and sub-Contractors. The key elements of this CEMP will form part of the site induction which will be mandatory for all employees, Contractors and visitors attending the site.

Environmental toolbox talks will be provided to all site personnel and sub-consultants on a regular basis. These will be targeted at particularly sensitive environmental issues such as:

- Protection of sensitive ecological habitats and key ecological receptors;
- Works close to sensitive water bodies;
- Areas of peat;
- Invasive species management;
- Water pollution and silt control;
- Water pollution in relation to cement and concrete handling;
- Spill prevention and control;
- Dust management.

## 1.5 EMERGENCY RESPONSE PLAN

The Contractor will be responsible for developing a detailed environmental Emergency Response Plan (ERP) for the proposed works, to cover environmental emergencies, as part of the H&S Plan. Details related to the ERP are outlined in Section 6.0 (Environmental Emergency Response Plan / Procedures) of this CEMP. Further information relating to the management of spills or leaks and the procedure for responding to an environmental incident is outlined in Section 6.2.

## 1.6 INCIDENTS / COMPLAINTS

Details related to the incidents / complaints are outlined in Section 6.0 (Environmental Emergency Response Plan / Procedures) of this CEMP.

# 2.0 SCOPE OF THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

The purpose of this document is to communicate the key environmental obligations that apply to all Contractors, their sub-Contractors and personnel while carrying out any form of construction activity for the development of the proposed project.

This CEMP should be read in conjunction with the Planning Documents & Drawings, the EIAR, NIS, and the construction stage elements[1] of the Traffic Management Plan (TMP) (see Appendix 2-4 of the EIAR). The CEMP draws from relevant good practice guidance, standards, and codes of practice applicable to the work being undertaken as part of the proposed project. The documents used to prepare the CEMP are listed in the reference section at the end of this document.

The CEMP is a live document that will evolve during the project. As such it will be subject to constant review to address:

- Any conditions required in the planning permission;
- To ensure it reflects best practice at the time of construction;
- To ensure it incorporates the findings of pre-construction site investigations;
- Changes resulting from the construction methods used by the contractor(s);
- Unforeseen conditions encountered during construction.

This CEMP provides a mechanism for ensuring compliance with environmental legislation and statutory consents. It defines the approach to environmental management at the site during the construction phase and addresses all relevant environmental aspects of the management of site preparation and construction work within the development works area (as set out in section 2.0 of Chapter 2 Description of the Proposed Project of the EIAR).

[1] See Section 3.0 (Construction Phase) and Section 4.0 (Construction Phase Traffic Management Plan) of the TMP (EIAR Appendix 2-4).

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7°36'0"W
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52°10'50"N
52°6'0"N
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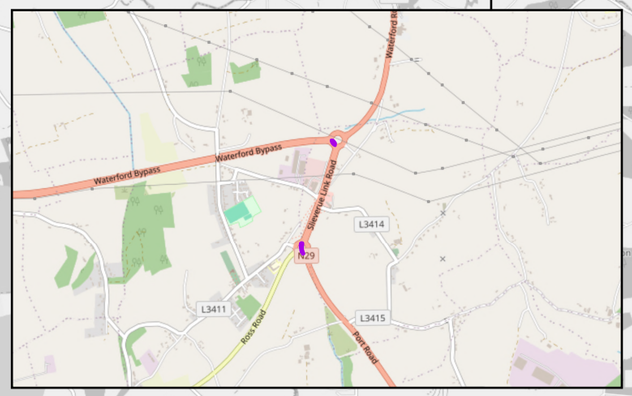


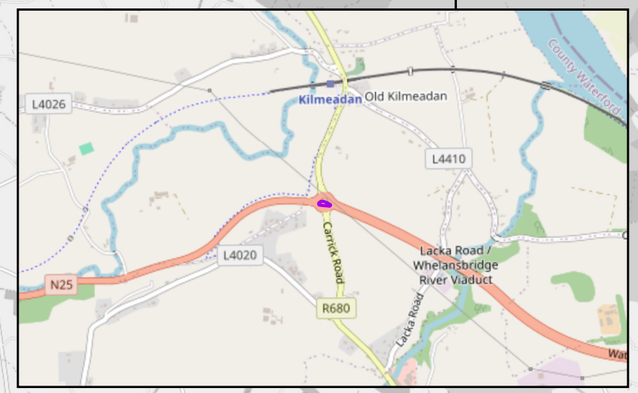


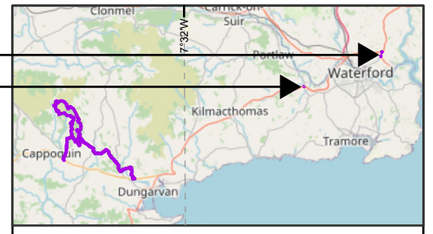


## Legend

Proposed project

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Kilometres

**NOTES**

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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| A | 13/12/2024 | First issue | S.P | J.S |

Client: FuturEnergy Ireland

Project: Scart Mountain Wind Farm

Title: Figure 2-1 Proposed project extent

| Scale @ A3: | 1:80,000 | |
|---|---|---|
| Prepared by: | Checked by: | Date: |
| S.Pezzetta | J.Staunton | December 2024 |


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Map Ref: 11303-005-TDR-S.BO-TOB-A

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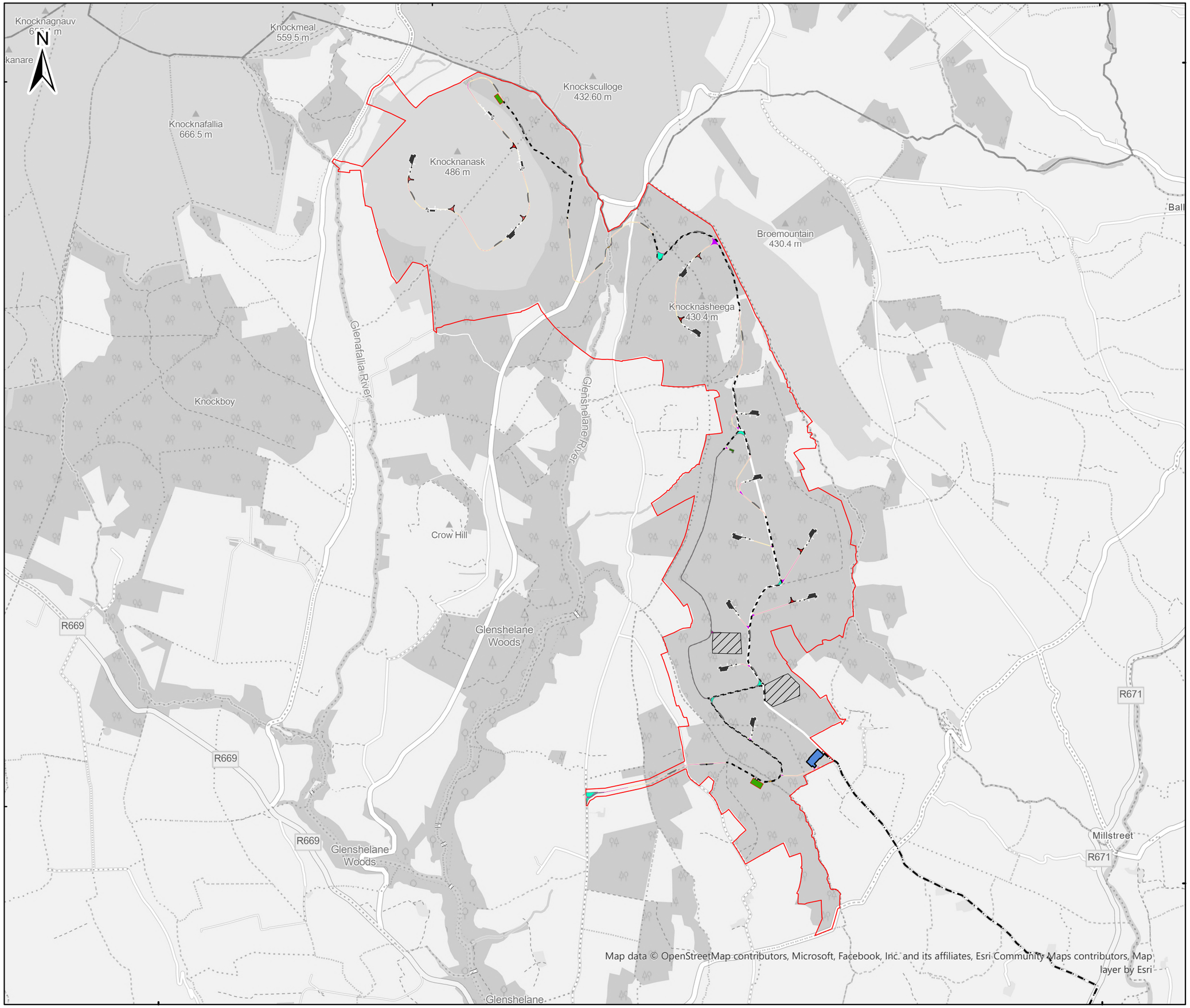


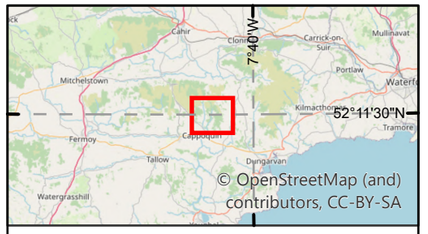


**Legend**

- Proposed Wind Farm Site
- Proposed Grid Connection Route

**Proposed infrastructure footprint within the proposed wind farm site**

- Proposed Site Roads
- Bridges
- Construction Compound
- Existing Site Roads
- Hardstands
- Met Mast Location
- Non turbine access roads
- Proposed Passing Bay
- Temporary Overrun Area
- Turning Bays
- Wheelwash
- Proposed Substation
- Borrow Pits

0 0.75 1.5
Kilometres

**NOTES**

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

| Rev | Date | Description | By | Chkd. |
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| A | 13/12/2024 | First issue | S.P | J.S |

Client: Ireland FuturEnergy

Project: Scart Mountain Wind Farm

Title: Figure 2-2: Proposed wind farm site layout

| Scale @ A3: | 1:30,000 | |
|---|---|---|
| Prepared by: | Checked by: | Date: |
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Map Ref: 11303-033-LAY.INFR-S.BO-TOB-A

Draft: A

## 2.1 KEY ROLES AND RESPONSIBILITIES

At this stage it is envisaged that the following roles will be appointed for the construction phase of the proposed project; Construction/ Site Manager; Environmental Manager, Ecological Clerk of Works (ECoW); Project Geotechnical Engineer / Geologist; and Project Archaeologist.

The names and contact details of the individuals with responsibility for implementation and supervision of mitigation measures during all phases of the development will be clearly identified and set out in documents such as the Contractor's CEMP and site- specific method statements as appropriate.

Summary details of these roles are outlined in the following sections. At construction stage, the Contractor's CEMP will confirm roles and finalise responsibilities and contact details once appointed.

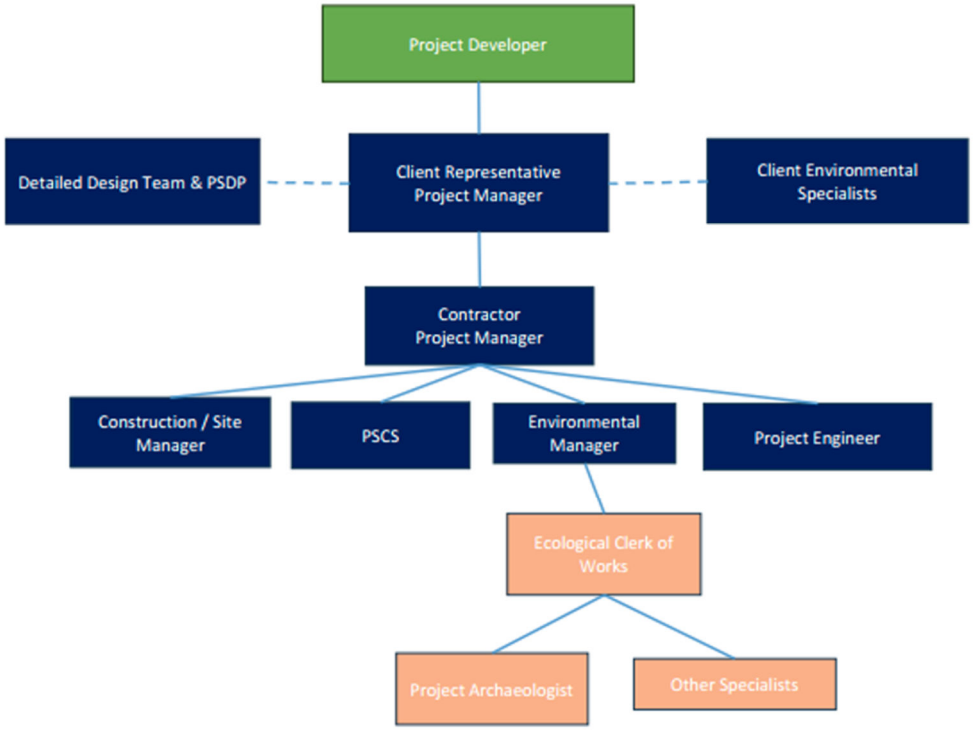


*Figure 2.2: Example Project Development Organisational Chart*

### *2.1.1 Construction / Site Manager*

A suitably qualified Construction / Site Manager will be appointed by the contractor for the duration of the construction period. The Construction / Site Manager will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements.

### 2.1.2 Environmental Manager

The Environmental Manager will ensure compliance with all relevant environmental regulations, and environmental quality control on-site during the construction stage. The Environmental Manager will be responsible for:

- The daily implementation of the CEMP and any other monitoring/mitigation proposals required under the planning consent;
- Ensuring that the objectives of the CEMP are achieved and maintained;
- Informing the appointed contractor(s) of the CEMP and ensuring that appropriate training and awareness materials are developed and implemented on-site;
- Co-ordinating and monitoring the inputs from the ECoW, Project Geotechnical Engineer and Project Archaeologist;
- Implementing appropriate measures in the event of any environmental incidents and managing communications with relevant authorities; and
- Regular communication with the Construction/Site Manager detailing the execution and progress of environmental activities on-site.

### 2.1.3 Ecological Clerk of Works (ECoW)

The role of the ECoW is defined by British Standard BS 42020:2013[1] as "*person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to "development" site personnel on necessary working practices required to i) safeguard ecological features on site and ii) aid compliance with any consents and relevant wildlife legislation related to the works.*".

Typically, the requirements of the ECoW role is largely fulfilled by a single individual, with support and assistance provided by technical specialists and senior colleagues when required, and will include:

- The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role and in addition, where needed, can access support from senior ecologists within the company with the required qualifications, training and experience;
- The ECoW will have the power to "Stop Works" at any time they deem it necessary to do so;
- The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology / biodiversity as set out project EIAR, NIS and supporting documents such as the, CEMP etc.;
- The ECoW will be responsible for the day to day management and interaction with the project Environmental Manager;
- The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation;
- The ECoW will provide the contractors team, with advice on environmental issues and compliance with planning conditions, commitments etc. as required. This includes managing certain activities that may be required in discharging consent conditions. The ECoW will inform the Contractor and Project Developer Teams of any information that could increase the risk of a non-compliance and/ or require a new licence, consent or approval.

During construction there will be occasions when the ECoW will be required to rapidly respond to unplanned events such as any wildlife incidents, pollution incidents, etc. The ECoW will have a very specific role within the emergency response teams responding to these incidents. Further

detail is provided in Section 6.0. The ECoW will also be expected to support the project team in resolving any other unplanned events that are not classified as emergency responses or incidents.

Non-Compliance Events

The ECoW shall produce a procedure setting out the sequence of actions to be completed and the lines of communication required to resolve and appropriately report on a non-compliance event relating to ecology/biodiversity, should one occur.

This procedure shall be approved by the Project Developers Team prior to construction commencing. The ECoW, and any other individual present on-site, has a duty of care to report any wildlife crime or breach of environmental legislation to the Project Developer. The Project Developer must report such breaches to the relevant authorities.

Reporting and Follow up

After the ECoW has responded to an incident or non-compliance event the ECoW will produce a report to the Environmental Manager for approval before it is issued to the Project Developer. The report will set out the following information as a minimum;

- Precise details of the event and those involved;
- Assessment of impact and severity (method for assessment to be developed by ECoW);
- Mitigation introduced;
- Subsequent revision of risk assessments and construction method statements and/or construction programme; and
- Lessons learnt.

Ad-Hoc Advice and Support

The ECoW will provide the Contractors Team, with advice on environmental issues and compliance with planning conditions, commitments etc. as required. This includes managing certain activities that may be required in discharging consent conditions.

### *2.1.4 Project Geotechnical Engineer / Geologist*

The Geotechnical Engineer / Project Geologist will report to the Environmental Manager and is responsible for inspection and review of geotechnical aspects associated with construction stage of the project. The Geotechnical Engineer / Project Geologist will be full time on-site during the site preparation and groundworks (such as excavation activities) and will visit site regularly at agreed periods during the construction phase.

### *2.1.5 Project Archaeologist*

The Project Archaeologist will report to the Environmental Manager and is responsible for inspection and review of any finds discovered during with the construction of the wind farm. The Project Archaeologist will monitor all stripping of topsoil for the proposed project, including the proposed GCR and will visit site at least once a month, or at agreed stages, during the remainder of the construction phase.

## 2.2 COMPLIANCE AUDITS AND COMMUNICATIONS

The ECoW and Environmental Manager will develop appropriate procedures and programmes for the following non exhaustive list of items:

- Environmental Audits, A programme of planned and spot check audits shall be developed and approved by the client;
- A programme of toolbox talks shall be developed. Toolbox talks covering relevant topics during construction;
- The ECoW and Environmental Manager will support the project team in producing site induction material tailored to the different activities carried out on site, and ensuring this material is appropriately incorporated into the overall project induction material. This will require attendance to project meetings, and production of material relevant to planning conditions and Environmental Legislation. The toolbox talks and site inductions shall include information on the role of the ECoW in the event of an incident;
- The ECoW shall ensure this information is included in the relevant induction and toolbox talk material. Once the above programmes and plans have been agreed, the Environmental Manager will be responsible for managing these plans and conducting the necessary audits, toolbox talks etc.;
- The ECoW shall check progress, and the Environmental Manager will be reporting on progress against the programmes, plans and status of completed audits, toolbox talks etc to the ECoW on a daily basis;
- The ECoW will be required to report on audits and toolbox talks delivered in the monthly compliance report;
- Occasionally the ECoW will be required to deliver toolbox talks and produce site induction material depending on the topic being considered.

# 3.0 CONSTRUCTION PROGRAMME (DURATION AND PHASING OF THE PROPOSED PROJECT)

It is estimated that the construction phase will take approximately 24 months from starting onsite to completion of commissioning of the turbines. Where practical, vegetation clearance that is required during construction works will commence outside the breeding birds season, which runs from the 1st of March to the 31st of August. If any minor clearance or trimming is required within those dates, or if the initial vegetation clearance extends past the 1st of March due to unsuitable weather conditions, the works will be preceded by an ecological survey (from a qualified and suitably experienced ecologist) to ensure there are no sensitivities associated with the action.

The construction phase can be broken down into 5 no. main phases as follows (there will be overlap of these phases):

- 14 months - Civils (including forestry felling and vegetation clearance, drainage, construction of site roads, hardstands, turbine foundation);
- 9 months - Electrical Grid Connection/substation installation and commissioning;
- 12 months - Site electrical (installing between turbines and substation, pulling cables);
- 4 months - Turbine deliveries and erection;
- 2 months - Commissioning.

## *3.1.1 Construction Hours*

The hours of construction activity will be limited to avoid unsociable hours, where possible. Construction operations will generally be restricted to between 07:00hrs and 19:00hrs Monday to Saturdays (Excluding public holidays).

However, during the following critical periods longer hours will be required:

- Concrete pours for turbine foundations;
- During turbine installation when the weather is suitable (i.e. light winds);

- Delivery of oversized loads;
- In the unlikely event of an emergency (see Section 5.0 Emergency Response Plan / Procedures ).

Any such out of hours working will be agreed in advance with Waterford City and County Council apart from in the case of an emergency and in line with the Schedule of Mitigation requirements of the EIAR (Chapter 9).

### *3.1.2 Employment*

It is anticipated that 87-116 persons will be directly employed during the peak construction period.

# 4.0 CONSTRUCTION METHODOLOGIES

## 4.1 OVERVIEW OF THE CONSTRUCTION METHODOLOGIES

The proposed construction methodology is summarised in the following sections, however further detail is found in Chapter 2 (Description of the Proposed Project) of the EIAR and drawings in Appendix 1-1 of the EIAR.

### *4.1.1 Turbine Hardstand, Foundations and Erections*

The topsoil will be stripped where development of the hardstands are proposed. The hardstands will be built up to create a level base which will be <0.5m above existing ground level.

Ground investigations in the form of trial pitting, probing, and use of augers have been carried out along the proposed turbine locations and hardstanding locations to inform the depth of excavation and upfill required (See Appendix 2-9 (Site Investigation Report) of the EIAR). Following site visits and site design, volume calculations provide an estimation of fill required for the hardstands. This is predicted to be approximately 110,000 $m^3$ of stone material. This material volume will be obtained primarily from the onsite borrow pits with only the surface 150mm layer to come from local quarries which are within reasonable proximity to the site. Each turbine foundation will require between 550-1,000 $m^3$ of concrete which will be sourced from off-site suppliers. No batching of concrete will occur on site.

The geotechnical investigations indicate that the foundations at the proposed wind farm will be excavated. Piling is not anticipated to be required.

Each of the turbines to be erected on site will have a reinforced concrete base. Overburden will be stripped off the foundation area to a suitable formation using a 360° excavator and will be stored as detailed in this CEMP and in the Peat and Spoil Management Plan (Appendix 2-3 of the EIAR). The sides of the excavated areas will be sloped sufficiently (2:1 for mineral soil, 1:1 for rock) to ensure that slippage does not occur. Excavations will be approximately 4 metres deep.

In the case of gravity foundations, if the formation level is reached at a depth lower than the depth of the foundation, the ground level will have to be raised with clause 804 hardcore material and/or lean mix concrete, compacted in layers as required. An interceptor drain will be formed around the upgradient perimeter of the turbine and hardstand to divert the clean water away from the works. This will outfall out at the lowest point level to a spreader. Water within the excavation will be treated via a settlement pond and level spreader. If the water has a heavy silt load, then an additional measure such as a siltbuster will be employed.

An embankment approximately 600mm high and a fence will be constructed around the perimeter of each turbine base to prevent construction traffic from driving into the excavated hole and also to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a gangway to a standard 1:12 grade, thereby allowing safe passage into/out of the foundation area.

Approved lifting equipment will be used to unload reinforcing steel to required areas. The bottom mat of steel will be fixed prior to the tower cans, if used, being lifted into position and reinforcing steel will be positioned and fixed in accordance with the turbine suppliers' requirements.

Formwork to concrete bases will be propped/supported sufficiently to prevent failure by compacting stone around the outside of the forms in addition to straps to prevent expansion. Concrete for bases will be poured using a concrete pump. After a period of time when the concrete has set sufficiently, the top surface of the concrete surface is to be finished with a power float.

Once the base has sufficient curing time it will be filled with suitable fill (i.e. hardcore) up to existing ground level. The working area around the perimeter of the foundation will be backfilled with suitable material (hardcore). These hardstand areas around the turbines will be levelled, compacted and finished with a suitable surface material for traffic (clause 804 or similar) as per the site access tracks and remainder of the hardstand areas.

Turbines will be erected in suitable weather windows (i.e. low wind speed). Following crane setup, the turbine tower sections will be delivered by truck and hoisted into place. This is followed by the nacelle and finally each blade. In accordance with an agreed lifting plan, turbine sections will be lifted by crane into place. Wind speeds will be monitored at all times during lifting operations. Turbine sections will be fitted together by workers within the structure. Following erection of the turbine, lightning protection, lighting and other ancillary components will be installed on the turbine and commissioned.

The turbines will be decommissioned using a similar methodology as the construction except in reverse.

### *4.1.2 Turbine Delivery Accommodation Works Area*

Where works are needed along the public road corridor to facilitate deliveries to site, they will be agreed in advance with the local authority and carried out to the appropriate road design standard (TII, purple book, etc.) to ensure they will be safe and durable in design.

At the locations where a temporary surface is needed for the proposed TDR, works will start with the clearing of vegetation (grass, hedgerows and scrub), and the topsoil will be stripped and either used locally for landscaping purposes/sidecast for later use in local reinstatement or used for borrow pit reinstatement onsite. Where local use for landscaping does occur it will be smoothed off with the back of a bucket and seeded with a suitable grass seed mix. Silt control curtains will also be employed within 50m of a surface watercourse. It will be taken to a local licensed/permitted waste facility if found to contain any contaminants such as bitumen. Suitable fill material (broken stone and clause 804) will be used to create a firm running area for the passage of turbine delivery vehicles. The areas will be fenced off when the delivery is not occurring. After the delivery of turbines to site, the site will be re-instated to the original condition with removal of the temporary surface, and any removed vegetation will be reseeded/replanted with a similar native species composition.

### *4.1.3 Wind Farm Site Roads (including Passing Bays)*

Site roads will be constructed to each turbine location, and to all proposed site infrastructure with a proposed running width of approximately 5m (5.5m including shoulders) with wider sections (which vary but are up to 10m) at passing bays, some corners and on the final approaches to turbine hardstands, as shown on the drawings accompanying the application. Passing bays will be included along roads strategically. Sections of new roads and upgraded roads are shown on Drawing 11303-2024 in EIAR Appendix 1-1 and as shown in Figure 2-1 above. There are two road construction methodologies; upgrading of existing site roads and excavated new road. These are described below in further detail.

#### Excavated New Road

Tracked excavators will be used to carry out excavations. Surplus excavated material will be dealt with as set out in Section 5.2.11 of this CEMP and the Spoil and Peat Management Plan – EIAR Appendix 2-3 of. The excavated roads will be constructed as per Drawing 11303-2013 of EIAR Appendix 1-1.

When the topsoil has been removed and/or the formation layer (bedrock/firm subsoils) has been reached, stone from the onsite borrow pits will be placed to form the road foundation. The sub grade will be compacted with the use of a roller or other similar approved compaction method. The top dressing will be added to the roads at this point. As a final measure to ensure long term stability of the road this layer will be checked and repaired as required after all turbine bases have been poured (i.e. after the heavy wearing traffic is largely finished).

All on-site roads will be maintained for the duration of the construction and operational phases of the project. They will be used for forestry (and agricultural) purposes after decommissioning of the wind farm.

#### Upgrade of Existing Site Road

The site of the proposed project has an existing network of site roads present which have been incorporated into the proposed design as much as possible.

Where an existing road needs to be widened, it will be carried out on both sides, and the same steps as described in the new road construction above will generally be followed (without excavating the existing road material) – see cross section Drawing 11303-2013 in EIAR Appendix 1-1. There are no significant known constraints running alongside the roads to be upgraded, but where forest or roadside drainage channels are located alongside the road (as they occur frequently through the site), they will be moved as required during dry weather periods where there is no moving water present within. The replacement drain will be constructed as per best practice for forestry drains[2].

Tracked excavators will be used to construct this road type. Surplus excavated material will be dealt with as set out in Section 5.2.11 of this CEMP as discussed above. When the topsoil has been removed and/or the formation layer has been reached, stone from the onsite borrow pits will be placed to form the road foundation. The foundations of the new and existing sections of the road will be built up to the required level. The sub grade will be

[2] Forestry Standards and Procedures, January 2015. Forest Service, Department of Agriculture, Food and the Marine.

compacted with the use of a roller or other similar compaction method. The top dressing will be added to the roads at this point. As a final measure to ensure long term stability of the road this layer will be checked and repaired as required after all turbine bases have been poured (i.e. after the heavy wearing traffic is largely finished).

All on-site roads will be maintained for the duration of the construction and operational phases of the project.

## Proposed Clear-Span Bridge and Culverts

There are 4 no. proposed river/stream crossing as shown on the site layout drawings (Appendix 1-1) of the EIAR. The crossing method of clear span bridges will avoid in-stream works entirely at the SAC crossing location (Glenshelane river), the other two crossings will require bottomless culverts.

At the Glenshelane crossing, the site access tracks will firstly be constructed to allow easy access to the works area (as described in the previous section), as there are currently no access roads at this location. The sediment control measures such as the triple silt fence will be installed before the works occur within 50m of the river (see Section 5.2.2 below). Following this, the topsoil will be stripped from the foundation footprint on either side of the watercourse, taking care to avoid disturbing any part of the river/stream bed or banks. Material will be removed immediately using dumpers travelling on the newly constructed roads. Only tracked machines will be permitted to travel off the road surface. No excavations will be permitted within the river channel or within 3m of it at the nearest point. Suitable stone fill material (clause 804 or similar) will be added in layers and compacted to form the base of the foundation. The precast clear-span bridge will be placed onto this either as one or more pieces using a mobile crane. There will be no requirement for large-scale casting of wet concrete. The construction work (in particular the initial excavation and stone compaction) will only take place in periods of low rainfall or dry periods (<10mm/24hr period) . Following the bridge construction, barriers will be attached to the sides of the bridge structure, and the site access tracks will be constructed over the structure. Further detail relating to water management is provided in Section 5.2.

The second proposed river/stream crossing relates to a single upgrade needed for an existing piped culvert to the east of the proposed southerly construction compound, on the Boherawillin stream (see Section 7 Mitigation Measures Agreed). The existing culverts will remain in place to avoid stream disturbance and the additional bottomless culvert will be added to extend this. Access is easily possible using the existing forest track. The final stream crossing relates to a new crossing of a small stream near the proposed substation. Construction methods will be similar to above with installation of a bottomless culvert. There is currently no road access to this location, so the proposed site roads will be constructed to the location first.

These two minor stream crossings will be crossed using bottomless culverts which will be over-sized (>0.7 m) for the expected water flow rates. Construction for these two stream crossings will take place during periods of dry weather/low flow. The sediment control measures such as the silt fence will be installed before the works occur within 50m of the stream (see Section 5.2 below). The topsoil will be stripped from the foundation footprint on either side of the watercourse, taking care to avoid disturbing any part of the river/stream bed or banks. Suitable stone fill material (clause 804 or similar) will be added in layers and compacted to form the base of the foundation. The bottomless culvert will be placed onto this either as one or more pieces. There will be no requirement for large-scale casting of wet concrete. See Drawing 11303-2015, EIAR Appendix 1-1 for details.

Where plastic or concrete culverts are required for forest /field drainage ditch crossings by new or upgraded roads, they will be installed with a minimum gradient of 1%. The pipe will be placed into the drain bed, and some of the underlying material will be placed within the pipe to benefit biodiversity (for further information see Section7.0 Mitigation Measures Agreed). The use of corrugated culverts will aid in the retention of sediment, thereby naturalising the culvert bed. Large stones will be placed at the culvert outfall to dissipate any flow and reduce the potential

### *4.1.4 110 kV Substation and Electrical Works*

The proposed substation has been designed and constructed to meet all the required EirGrid/ESB standards. An area will be levelled and built to the required level with stone fill material, capped by high quality compacted stone. Two control buildings will be constructed using traditional techniques for constructing small buildings (i.e. concrete block walls, timber and slate tile roof). Foundations will be built for all of the proposed electrical infrastructure. All the electrical equipment will be installed to EirGrid/ESB requirements. Perimeter fencing will be constructed around the substation compound for security and safety purposes. Further information and drawings of the substation and electrical infrastructure are provided in EIAR Appendix 1-1 while the associated construction methodologies provided in EIAR Appendix 2-5.

A local electricity supply will be made from the nearest suitable power lines at the time of construction in the same way that residential houses are connected. Standard overhead electricity poles and cables will be installed avoiding sensitive habitats and using a minimal footprint. See Section 2.7.7 of Chapter 2 of the EIAR for further information.

Internal cables connecting the wind turbines to the onsite substation will be laid within or immediately adjacent to the onsite access roads. All cables will be laid in underground ducts. Ducts will be installed by open trenching. Information on trench construction methodology is provided in Section 4.1.5.1.

### *4.1.5 Proposed Grid Connection Route (GCR)*

As stated above, the proposed wind farm will connect to the existing national grid via an underground grid connection. The onsite substation and associated grid connection route has been assessed in the EIAR, along with the required works to allow connection to the grid at the existing Dungarvan substation.

Once fixed into position, the internal site cabling (between turbines and the substation), the substation and the electrical proposed GCR will all be commissioned. They will remain powered off until the turbines are being commissioned, as shown in Figure 2-1 of Chapter 2 (Description of the Proposed Project).

Full details of the description of the proposed GCR works, and the construction methodologies for each element including watercourse crossings are provided in EIAR Appendix 2-5. The construction methodologies for the various elements of the proposed GCR are summarised below.

#### 110kV Underground Cable Trenches

The 110kV cables will be installed mainly within the internal access roads in the proposed wind farm site and within the existing public road corridor. A section of the route (approximately 1.8km) will be located off road at the Colligan River crossing as well as adjacent to the Dungarvan substation and within the proposed wind farm site. A

service/maintenance access track will be put in place over the entire route. It should be noted that works within the public road corridor will also be subject to further consents/agreements with local authorities, for example a Road Opening Licence as appropriate.

All cables will be laid in underground ducts. Ducts will be installed mostly by open trenching. The sequence of operations for installing ducts in trenches is to firstly strip off the ground material and topsoil (if present). A trench is then formed to the required depth and width. The ducts are generally laid on a bed of Cement Bound Granular Mixture (CGBM) and surrounded with CGBM. Where contaminants are found (or where bitumen-based materials are present) in excavated material, it will be removed from site by a licensed operator and disposed at an appropriately licenced facility. The top of the trench will generally be finished at ground level with stone as per EirGrid/ESB specifications (or in the case of trenches within public roads, it will be finished in a suitable road surface (at a minimum to the pre-existing standard) that will be agreed with the local authority in advance of works. The use of stone in this instance (off the public road corridors) will ensure the track is permeable and eliminate the potential for surface water runoff, as well as allowing vehicular access on the rare occasion it might be required.

Works will not be carried out during periods of heavy precipitation. In the event that some surface water does accumulate in the trench, this will be allowed to percolate into the ground naturally.

Cable joint pits will be located at regular intervals as shown in the site layout drawings (EIAR Appendix 1-1). They will be constructed off narrow sections of the public road where this is possible (i.e. before/after it enters the road corridor, in lay-bys, etc.) A temporary surface is provided over these for safety and to allow easy access until the cables are pulled, after which time the area will be permanently reinstated/surfaced as appropriate.

It is anticipated that construction will be carried out by a single team (with plant items likely to include excavators and dumpers) along the route, but there is a possibility to use two separate teams to speed up the construction. It is expected that each team will lay approximately 150m of the route per day.

Further information and drawings of the underground 110kV cable trenches are provided in EIAR Appendix 1-1, while the associated construction methodologies are provided in EIAR Appendix 2-5. A copy of the EirGrid 110 kV cable installation specifications are provided as EIAR Appendix 2-6.

A Traffic Management Plan has been prepared for the proposed project and is included as EIAR Appendix 2-4. This is a live document and will be updated ahead of construction to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by An Bord Pleanála, in the event planning permission/approval is granted. Also, a confirmatory survey of road condition, including the condition of all road water crossings on the route, will be carried out along the proposed GCR in advance of any works.

## Stream Crossings

The proposed GCR contains four stream/river crossings. These are shown in EIAR Figure 2-6 and the site layout drawings in EIAR Appendix 1-1. Table 2-3 below details the proposed methodologies for crossing the given watercourses.

*Table 1-2: Watercourse crossing details*

| Watercourse Crossing No. | Crossing details | Proposed crossing methodology | In Stream works required? |
|---|---|---|---|
| 1 | **Stream** | Directional Drilling | No |
| 2 | **River** | Directional Drilling | No |
| 3 | **River** | Directional Drilling | No |
| 4 | **River** | Directional Drilling | No |

The construction methodologies for the crossings are provided below. The route also contains minor forestry/field/road drains which are usually dry, and only contain water during periods of heavy rainfall. These will be crossed using open trench crossings during dry periods.

Crossing Methodology Directional Drilling

A launch and reception pit is required for directional drilling, with each measuring approximately 1m wide, 2m long and 1m deep. Two ducts will be required at each crossing location. A specialised directional drill machine will be anchored to the ground and will drill at a suitable shallow angle to allow it to achieve the required depth for the bore. If ground conditions are unfavourable, the drilling process will need to be repeated using progressively larger drill heads until the required size is achieved.

The drilling process involves pumping a drilling fluid through the drill head. The fluid is inert, natural and biodegradable. This fills voids locally around the drill head and enables the drill to progress without the hole collapsing. The duct will be positioned, and the launch and reception pits will be refilled.

Further details of this crossing method are provided in EIAR Appendix 1-1 while the associated construction methodologies are provided in EIAR Appendix 2-5.

### *4.1.6 Permanent Meteorological Mast*

The met mast installation works will be carried out by a small crew and are described as follows, as illustrated on Drawing 11303-2016 in EIAR Appendix 1-1.

An access track will be extended towards the mast location from the existing forestry track. The access track will be 3.5m in width. Associated drainage infrastructure will be extended also.

A small stone crane pad will be constructed in front of the proposed mast location.

General construction methods for the above access track and hard standing will match those described for wind farm access tracks and hard standings.

The foundation will be excavated followed by shuttering, steel fixing and finally concrete pouring by ready mix truck. Excavation and concrete operations will be carried out as described in Section 4.1.8 of this CEMP. The foundation will be 10m x 10m x 1.8m in size.

### 4.1.7 Forestry Felling

For the footprint of the infrastructure, there will be full tree removal. Due to the fact there are many age classes that are to be felled i.e. commercial and non-commercial timber, it is envisaged that any commercial timber will be removed from the site for haulage to a timber sawmill. For the purposes of the EIAR it is assumed that the timber will go to one or more of the following sawmills:

- Glennon Brothers, Fermoy, Co. Cork;
- O'Keefe Sawmills, Lismore, Co. Waterford;
- Patrick Sheehan Sawmills Ltd., Ballyporeen, Co. Tipperary;
- Richard White Sawmills Ltd., Co. Kilkenny.

All of these will utilise the L5055, L1029 and the N72 to leave the site, and will utilise mostly the national road network to reach the sawmill location.

A report detailing the forestry felling is provided as EIAR Appendix 2-7. Offsite forestry replanting is considered within cumulative assessments through the EIAR.

### 4.1.8 Borrow Pits

Material will be extracted from the borrow pits, to avoid the need for large stockpiles of material. There will be some small stockpiling of material as rock is broken/crushed, but these will be kept to a minimum. In general, construction will start from the south of the site and work northwards, and the first borrow pit will be used for the construction of the infrastructure in the southern half of the site (i.e. where there are extremely limited peat deposits). As construction moves to the northern half of the site (where the vast majority of the peat is located, albeit still shallow) then the second borrow pit will be used. The extant first borrow pit will at that stage act as a confined cell for the direct placement of any peat that is excavated while the second borrow pit is in operation (only one will operate at a time). Therefore, there will be no unconfined stockpiling of peat, and no confining structure will need to be constructed for peat. The second borrow pit will be reinstated with any mineral soils that have been temporarily stockpiled on site, or any spoil remaining once landscaping works have been completed. Further detail on the construction of the borrow pits is provided in Chapter 8 (Land, Soils and Geology).

There is an absence of notable peat at the borrow pit locations, so any soils/subsoils removed from here to open up the borrow pits will not have a significant slippage risk if temporarily stockpiled in accordance with best practice. During the extraction of the first borrow pit, removed spoil will be stored in a temporary stockpile with appropriate gradient (i.e. 1:2) and appropriate mitigation will be used to ensure the protection of downgradient watercourses (i.e. the use of silt fences, collector drains, siltbusters, etc. as described in Section 5.2 below). All of the spoil temporary stockpiles will be confined to within the boundary of the two borrow pits, which cover relatively flat areas with the exception to where material is side cast from small/narrow pieces of infrastructure.

Once the required rock has been extracted from each borrow pit, they will be reinstated using any suitable material from the site (including peat) and made secure using permanent stock proof fencing.

Rock and fill material will need to be extracted from several proposed turbine foundation locations. In that case, this material will be used where possible to replace the material requirements from borrow pits, meaning the figures above are likely to be lower than mentioned.. Once the required stone has been mined from each borrow pit, it will be reinstated using excess spoil from the site, some of which will be peat. The borrow pits will

be excavated into the ground and on completion of reinstatement they will be no higher than existing ground level. The borrow pits are both located on relatively flat ground with only very gentle slopes. As the borrow pit excavation will be below ground, there will be no requirement for construction of berms or any retaining features for spoil, and slippage of peat will not be possible from the excavation (i.e. the peat will be stored below the lowest edge of the borrow pit rim so it cannot leave under gravity). Therefore, there will be no peat stability risks associated with storage.

## Rock Extraction Methods

The rock will be extracted from the proposed borrow pits using two main methods: Rock breaking and rock blasting. Both methods would be suitable for use on this site considering the geology and soil conditions there, and it is proposed to use a combination of both. The absence of notable peat depths near the proposed borrow pits means that there will be no implications for peat stability around the borrow pits.

## Rock Breaking

Rock breaking can be used to extract rock in many situations and is particularly suitable for any brittle rock and rock near the surface. A hydraulic rock breaking attachment is fitted to the arm of a large tracked excavator, and this breaks large pieces of rock from the ground. These large rocks are broken down into smaller pieces using these hydraulic rock breaking attachments, until they are small enough for use or to fit into a rock crusher. At that point, a large loader feeds them into a mobile rock crusher, where they are crushed, graded into various sizes, and removed by the loader (and trucks) for use on site. They will be removed as they are produced, and as such there will be no stockpiling apart from the area within the borrow pits adjacent to the crusher. Stockpiles will build up under the conveyor belts of the crusher for use on site. The potential noise impacts of rock breaking have been assessed in EIAR Chapter 12 (Noise & Vibration).

## Rock Blasting

Rock blasting is an effective way to produce a large volume of broken stone in a very short time, as the blasts only last a number of milliseconds. All parts of the blasting process from drilling to explosives handling to execution of the blast itself will be designed and carried out/overseen by a specialist engineer. In order to carry out a blast, a number of holes are drilled into the rock over several days. Once these are prepared, the required amount of explosives will be brought to the site and installed in the holes. The explosive material will not be stored on site, and the transport and handling of the material, as well as the carrying out of the blast will be carried out with agreement and supervision of An Garda Siochána. The charges will be set, the area will be cleared and the blast carried out by a specialist engineer. After a blast, the rock will be able to be loaded into a crusher with a loader and processed for use on site.

Based on site investigations undertaken within the proposed project site, rock blasting will be required due to the strength and low fracture density of the underlying bedrock. In the event blasting is required, local residents (all located >450m from a borrow pit or >800m from a turbine location) and noise sensitive locations (such as local schools) will be notified of the upcoming blast. Blasting will only occur occasionally on site as required with the frequency depending on what stage construction is at. The vibration will not have any effect on peat stability due to the absence of peat on much of the site and shallow peat elsewhere. The potential noise and vibration impacts of blasting have been assessed in Chapter 12 (Noise & Vibration).

Stone and Fill Requirements

A significant amount of stone and aggregate fill material will be required during construction. This will be used under and around key infrastructure including the turbines, substation, site roads, hardstands and construction compounds. The following are the approximate estimates of the material requirements at the various main infrastructure locations:

- Internal Access Tracks – 38,000m$^3$ is required, of which 26,000m$^3$ for the initial base layer (i.e. the first thick layer on the ground) will come from onsite sources with the remaining final surface material being sourced from offsite quarries;
- Substation and Construction Compounds – 9,260m$^3$ of which 3,500m$^3$ for the initial base layer will come from onsite sources, with the remaining material being sourced from offsite quarries;
- Turbines and associated hard stand areas – 66,500m$^3$ of which 25,500m$^3$ for the initial base layer will come from onsite sources, with the remaining material being sourced from offsite quarries; and
- Backfill around cables – 10,000 m$^3$ from external/offsite source

By sourcing the majority of the required stone volume from the onsite borrow pits as described above, the volume of traffic that will occur on public roads in the area will be significantly reduced. Stone from offsite sources will be used for surface dressing, while stone sourced onsite will be used for the initial capping layer. Further information on the proposed traffic volumes and impacts are discussed in Chapter 16 of this EIAR (Traffic & Transportation), while further information on the offsite/external sources being considered is provided in Section 5.3.

Hardstands and site roads will be constructed to be above the existing ground level. The lower layer (approx. 300mm) of this will be lower grade stone, with the top 150mm being high quality compacted aggregate. Internal cable trenches which connect each turbine to the proposed onsite substation will be 1500mm deep, with the first 600mm being backfilled with sand. The excess excavated material will be used for backfilling of the borrow pits to the surface.

### *4.1.9 Temporary Construction Compounds*

At the commencement of the construction phase, a temporary compound area will be constructed. At a later stage of the site development (when the construction works reach the northern Knocknanask end of the site) a second compound area will be constructed there as per the proposed site layout to provide additional facilities onsite. At the end of the construction phase, the compounds will be removed, with any stone being used towards reinstatement of the nearest onsite borrow pits. After removal of the compound, the area will be reinstated with topsoil and replanted with forestry as described in EIAR Appendix 2-7.

### *4.1.10 Spoil Management*

The use of the borrow pits will be phased. This will allow materials to be permanently placed in the first borrow pit while the second is in use, thereby minimizing the volume of soils requiring temporary storage. In order to further reduce temporary storage requirements, soils and turves will be reinstated around infrastructure as part of restoration and landscaping works. This will be carried out during the construction phase, as soon as is practical after the completion of the works in any one area of the site. Approximately 90,000 m$^3$ will be excavated from the borrow pits onsite. Peat will be placed at the borrow

pits below the existing ground level to ensure containment. A total of 80,000 $m^3$ will be used to reinstate the borrow pit area as well as for landscaping.

Where the proposed project footprint is located on any mineral-based soil, this material will be side-cast and profiled as close to the excavation areas as practical. In the case of peat, or where other adjacent infrastructure or constraint features might prevent side-casting, it will be used to reinstate the borrow pits. The sides of the excavated areas will be battered/sloped sufficiently to ensure that slippage does not occur (2:1 for mineral soil). The excavated sidecast material will be smoothed with the back of an excavator bucket and surrounded by silt fences to minimise the potential for sediment-laden run-off occurrence. Side-casting will not occur within 50m of a watercourse. The side-cast material will be used later in backfilling the working area around the turbine foundations, or for landscaping locally or reinstatement elsewhere on site (such as the borrow pits). Further and more detailed information on the spoil management is provided in EIAR Appendix 2-3 (Spoil & Peat Management Plan).

Where side-casting is not possible, topsoil and sub-soil are to be stockpiled separately. Turves will be stored turf side up and will not be allowed to dry out. Stockpiles are to be isolated from any surface drains and a minimum of 50m away from watercourses and will be located at points with easy access to internal roads within the proposed borrow pit areas which have not yet been extracted. Measures that will be employed will include interceptor ditches around these areas (with sediment traps within these – see Drainage Drawings 11303-2040, 11302-2041 and 11303-2042 in EIAR Appendix 1-1) deployment of double silt curtains and seeding of the piles will be incorporated to prevent runoff of suspended solids and soil erosion. No permanent spoil or stockpiles will be left on site. No stockpiles will be located on peat areas. Peat material (from Knocknanask in particular) will be used to reinstate the borrow pits (see Section 4.1.8 above).

Where available, vegetative sods/turves or other topsoil in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface. Where sods/turves are not available, some seeding with native species will be carried out. This method for restoration of excavated or disturbed areas is to encourage stabilisation and early establishment of vegetation cover.

To prevent erosion and run-off and to facilitate vegetation reinstatement, any sloped soil embankment will be graded such that the slope angle is not too steep (i.e. 1:3) and that embankments match the surrounding ground profile. See Section 2.8.9. for further information on sequencing and spoil management.

Management of spoil for the proposed TDR and the proposed GCR are discussed in sections 4.1.2 and 4.1.5 respectively.

## Sequencing and Spoil Management

It is proposed that works will start at the southern end of the proposed wind farm site, where peat is either absent or extremely shallow, and the topography is flattest. In this part of the site, side-casting will be appropriate in most locations (apart from within 50m of watercourses). One borrow pit will be used to source stone material for the southern half of the site, while the other borrow pit will be used to temporarily deposit excess inorganic soils. As the construction moves to the northern half of the proposed wind farm site where the topography is steeper and there is slightly more peat in some locations (albeit still shallow at mostly <0.5m), the second borrow pit will be utilised as a source of stone after any temporarily stock-piled material is transferred to the first borrow pit. Any peat that is

stripped at this stage will then be deposited straight into the first borrow pit, below ground level avoiding the potential for any slippage.

Peat and Soil management measures are detailed further in Section 4.1.5.7 of Section 4.0 Environmental Management of this CEMP.

# 5.0 CONSTRUCTION MANAGEMENT

.The following sections provide an overview of the approach to the management of environmental aspects during the construction of the proposed wind farm, as identified within the EIAR, NIS and other supporting documentation..

## 5.1 SURFACE WATER MANAGEMENT

### *5.1.1 Existing Site Drainage*

The proposed wind farm is located within the Blackwater (Munster) Framework Directive catchments (hydrometric area) in west Waterford. These catchments are further subdivided into sub-catchments with the site located within the Blackwater (Munster)_SC_140 WFD sub-catchment and the Finisk_010 WFD river sub-basin (see Figure 9-2 of Chapter 9 in this EIAR – shown here for convenience as Figure 2-6).

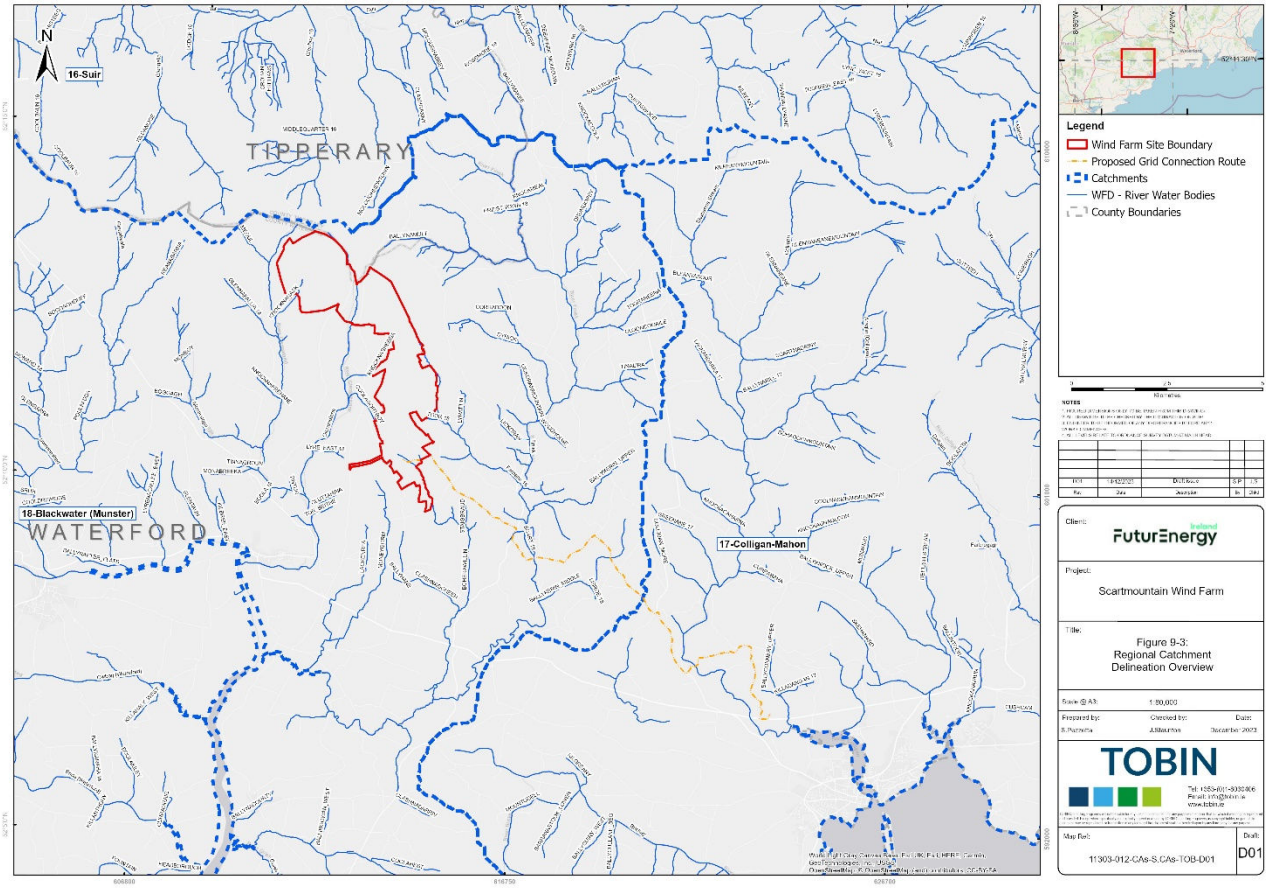


*Figure 5.1 - Regional Catchments Overview. Larger version shown as Figure 9-2 in Chapter 9 of the EIAR. Duplicated here for convenience of reader.*

These waters are of moderate to steep gradient near the proposed wind farm, representing natural watercourses typical eroding/upland rivers, that are actively eroding, where there is little or no deposition of fine sediment. The Glenshelane river flows in a southerly direction through the north-westerly part of the proposed wind farm site. Streams mostly flow in a general north to south direction, ultimately flowing into the River Blackwater. There are no lakes identified on the proposed wind farm site.

The site and adjacent lands also include man-made drains which flow into the watercourses mentioned above. These are primarily used to assist in the drainage of forestry and agricultural land-use. Natural watercourses and drainage ditches on site will be crossed by the proposed access tracks.

Further details on the existing and proposed site drainage are provided in Chapter 9 Hydrology & Hydrogeology of the EIAR.

### *5.1.2 Proposed Site Drainage and Silt Control*

The proposed surface water drainage system utilises sustainable drainage devices and methods. Surface water management on wind farm construction sites utilises well-established and well-understood techniques. These management methods are standard ones in the industry, and they have a long-term record of a high level of efficacy. Wind farm construction has been ongoing in Ireland for over 30 years, and where the mitigation and methods are correctly implemented, water quality is generally not a significant issue over that period. The measures outlined in this project have been developed are based on the CIRIA (Construction Industry Research and Information Association) C648 (Control of water pollution from linear construction projects) guidance, and that guidance has itself been developed based on site experience in Ireland and the UK over recent decades.

**Construction Phase**

Temporary (for the duration of the construction phase) and permanent drainage infrastructure will be installed as part of the development of the proposed site.

During the construction phase, all run-off from construction areas will be controlled and treated to reduce suspended solids concentration prior to being discharged into the existing drainage network or overland. A number of temporary settlement ponds will be established during the construction phase along roadways and in areas of high construction activity (adjacent to turbine foundations, borrow pits, construction compounds etc) to minimise silt laden run-off entering the drainage network. The settlement ponds will be designed to provide sufficient retention time and a low velocity environment to allow suspended solids to fall out of suspension prior to allowing the water to outfall to the receiving environment. The proposed locations of the permanent and temporary settlement ponds, and details of same are shown on Drawings 11303-2040/ 11303-2041/ 11303-2042 of EIAR Appendix 1-1.

A Surface Water Management Plan (SWMP) has been prepared (EIAR Appendix 2-10). The purpose of this plan is to ensure that all site works are conducted in an environmentally responsible manner so as to minimise any potential adverse impacts from the proposed project on surface water quality. The plan incorporates the following specific objectives:

- Provide overall surface water management principles and guidelines for the construction phase of the proposed project;
- Address erosion, sedimentation and water quality issues;
- Present measures and management practices for the prevention and/or mitigation of potential downstream impacts;
- A summary of the surface water mitigation is included in Table 2-3 below.

*Table 5-1: Mitigation Measures matrix*

| | Turbines | Substation and compounds | Deposition areas | Access tracks | Borrow Pits | Grid |
|---|---|---|---|---|---|---|
| Utilise existing bridges and access roads | - | - | - | ü | - | ü |
| >50m Buffer | ü | ü | ü | | ü | |
| Interceptor drains | ü | ü | ü | ü | ü | |
| Check Dams or similar | ü | ü | ü | ü | ü | ü |
| Swales | ü | | | ü | ü | |
| Sediment traps | ü | | ü | | | |
| Settlement Ponds | ü | ü | ü | | ü | |
| Proprietary Settlement tanks | + | + | | | ü | |
| Weather dependant | ü | ü | ü | ü | ü | ü |
| Silt Fences | + | | ü | ü | | |
| Clear Span Bridge | | | | ü | | |
| Concrete washout control measures | ü | ü | | | ü | ü |
| Chemical/fuel bunds | ü | ü | ü | | ü | ü |

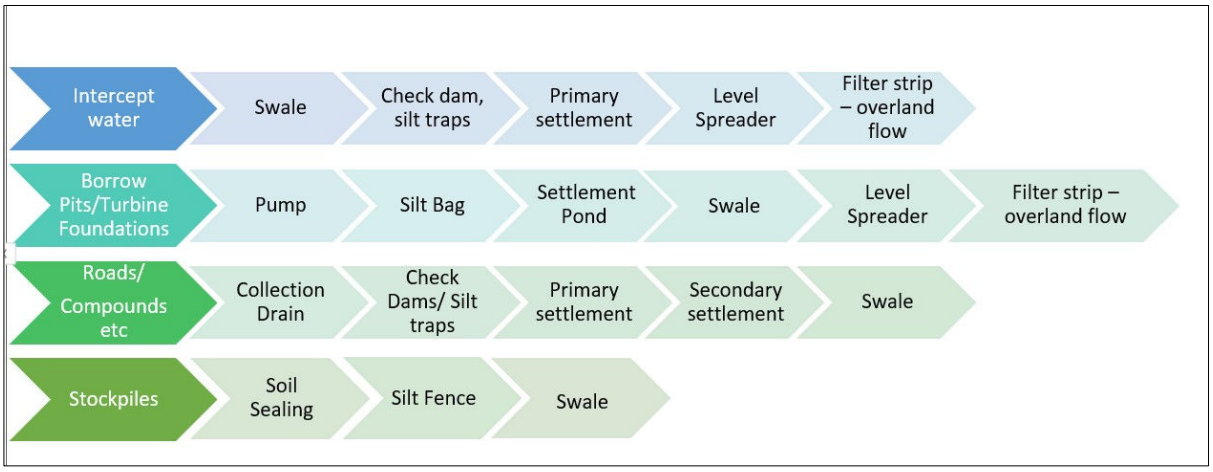


*Image 1 Treatment train*

Clean surface water discharge will be attenuated to greenfield rates. Level spreaders/diffusers will be used where overland discharge of water is carried out. The level spreader will prevent soil erosion at these locations by spreading out and slowing down the water.

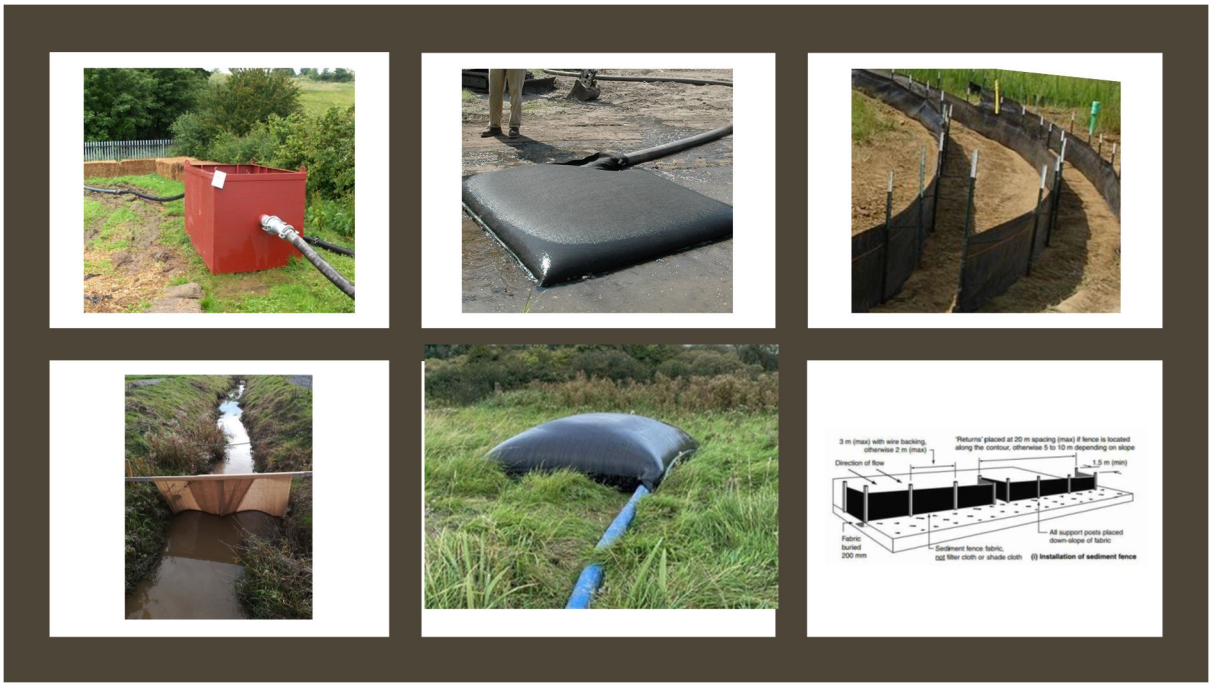

*Figure 2-5.2: Examples of Proprietary Silt Control measures*

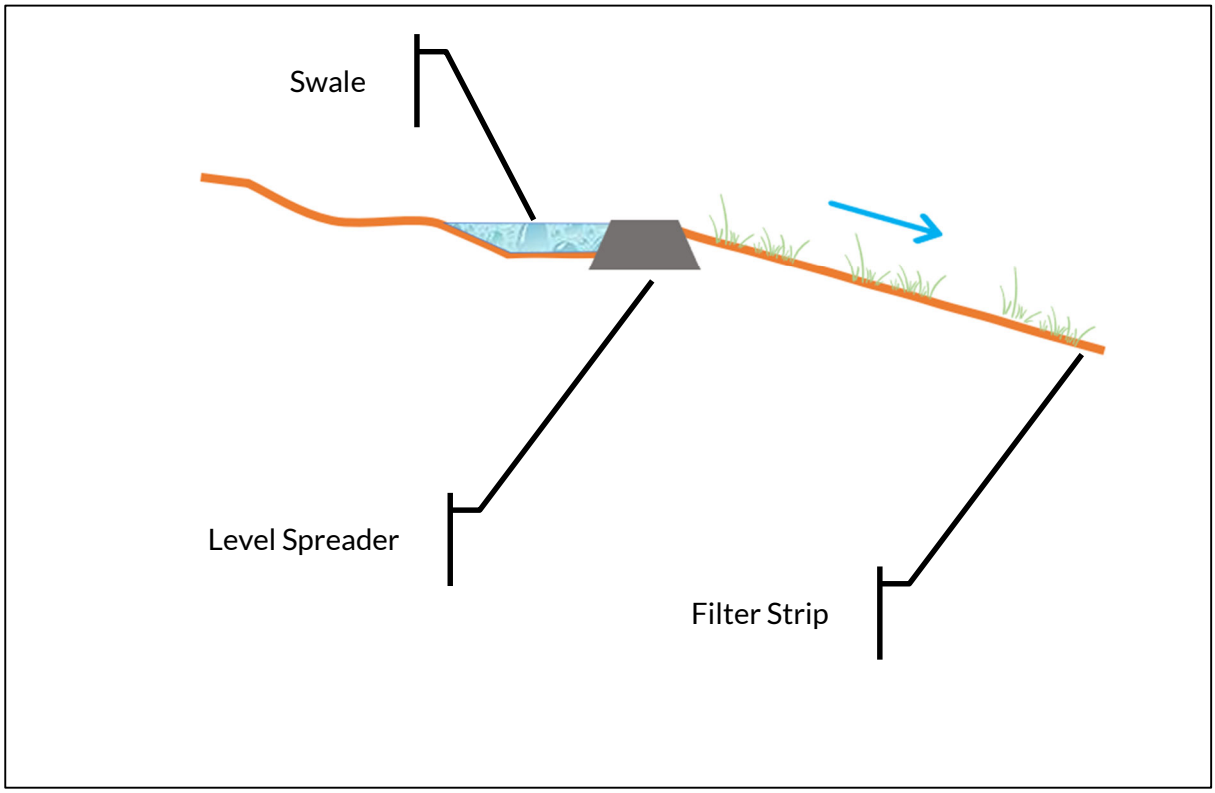


*Image 2 Conceptual Level Spreader and Filter Strip*

## Operational Phase

The drainage layout for the operational stage of the proposed project has been designed to collect surface water run-off from roads, crane pads and hardstanding areas for treatment and to maintain the existing site discharge rates. Run-off arising from the development will discharge into settlement ponds specifically constructed for managing surface water from

the wind farm. Temporary settlement ponds for the construction phase (i.e. borrow pits, construction compounds) will be removed at the end of the construction phase upon reinstatement of those features. Details and locations of the proposed settlement ponds are shown on the drawings of EIAR Appendix 1-1.

Once treated in the settlement pond the treated surface water will then be allowed to spread across the adjacent vegetated lands via a level spreader /diffuser which will minimise any risk of soil erosion and allow further filtration of any remaining sediment particles. Level spreaders and existing vegetation will help slow and distribute runoff evenly. This treated water will ultimately percolate to ground or travel over-ground through vegetation and be assimilated into a drain or stream onsite at appropriate greenfield run-off rates (i.e. the runoff of the site at natural rates without development). There will be no direct discharges from the wind farm. The measures outlined for this project are based on the CIRIA C648 (Control of water pollution from linear construction projects) guidance, and that guidance has itself been developed based on site experience in Ireland and the UK over recent decades.

**Decommissioning Phase**

The decommissioning phase will not require any significant works that will impact on the drainage network, as the drainage system will remain in place to serve the access roads.

For each phase of development, the production of water quality and prevention of pollution events requires a sustained and concentrated input from the Contractor with regard to the provision and maintenance of sediment control structures. The drainage system is described in further detail the Surface Water Management Plan (SWMP).

### *5.1.3 Culverts & Clear Span Bridges*

Culverts will be required where site roads or hardstands cross minor forest drain networks. The use of culverts will only be employed for minor field/forest drains.

There are two stream crossings required for the proposed site road network, for which the proposed crossing methodology is use of bottomless culverts. The streams on site are <2.5m wide.

The use of a clear-span bridge will be used for the Glenshelane river crossing to avoid the requirement for in-stream works. Therefore, there will be no direct effect on the stream at the proposed crossing location and downstream. The clear-span bridge will be sufficiently above the stream to allow unrestricted flow of water beneath. The proposed clear-span bridge location and design detail are provided EIAR Appendix 1-1. The construction method for these structures is described in Section 4.1.3.3 above.

Where culverts are required for smaller drains such as forest drainage ditches, precast concrete or plastic culverts of between 300-900mm in diameter will be provided, a drawing of which is shown in EIAR Appendix 1-1.

### *5.1.4 Pre-emptive Site-Drainage Management*

The works programme for the initial construction stage of the proposed project will take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of subsoil or vegetation stripping will be suspended or scaled back if heavy rain is

forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and a combination of them will be used on a daily basis at the site to direct proposed construction activities:

- General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and
- Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.

### *5.1.5 Refuelling - Fuel and Oil Management*

Any easily manoeuvrable road-going vehicles (i.e. cars, jeeps, lorries etc) will be refuelled off-site. For any vehicles which are slow moving or tracked or those for whom regular trips off-site to refuel will not be practical, on-site fuelling will be required.

A limited amount of fuel will need to be stored on the site within the construction compounds for this purpose, and this will be within a double skinned and bunded mobile tank which can be moved around the site using a 4x4 vehicle to refuel. This will be stored in the construction compound when not in use.

A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the tank at all times. The drip tray and fuel absorbent mats will be used at all times during refuelling. Similar spill kits will be stored in each construction compound, and at the on-site substation in case of emergency.

No refuelling will be carried out within 50 m of a stream. The fuel bowser, typically a double-axle custom-built refuelling trailer, will be re-filled off-site, where possible, or at either of the two construction compounds and will be towed as required within the site by a 4x4 vehicle to where machinery is located. It is not practical or preferable for most heavy construction vehicles (such as cranes, excavators, dozers, dumpers etc.) to travel back to the refuelling point in the construction compounds given the size of the proposed wind farm site. The 4x4 vehicle will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level impermeable area in either of the construction compounds when not in use.

Oils, lubricants and other hazardous liquids required for maintenance of equipment during the construction phase will be stored on the dedicated impermeable storage platform in the

construction compounds. Any additional fuel containers, other than the fuel bowser, used for smaller equipment (such as generators, lights etc.) will be stored within additional secondary containment e.g. bund for static tanks or drip trays for smaller mobile containers. Taps/nozzles for fuels and storage containers for oils will be fitted with locks to ensure their use is controlled. Only designated trained and competent operatives will be authorised to refuel plant on site.

New clean ancillary machinery equipment such as hoses, pipes and fittings required on-site will be contained within a bunded area, however any used or damaged parts will not be stored on-site and will be removed immediately. Any repair works required on machinery involving fuel and oil control will be carried out off-site where practical, or in the construction compounds over an impermeable surface. Unless unavoidable, repair works carried out in the field where machinery is operational will use spill trays and absorbent materials to prevent release of contaminants to the ground. Maintenance and repair works will be carried out at least 50m from any stream.

At least daily checks prior to start-up of plant and machinery will minimise the risk of break-down and associated contamination risks for on-site repairs. Records of daily pre-start checks will be maintained and kept in the site office. A clean site policy and diligent housekeeping will also reduce the potential of hydrocarbon release on-site.

### *5.1.6 Spill Control and Response*

Emergency spill kits with oil boom and absorbent materials will be kept on-site in the event of an accidental spill. Spill kits will be stored in each construction compound, and at the on-site substation in case of emergency and with the 4x4 vehicle transporting the fuel bowser, smaller spill control kits will also be kept in all construction machinery. All construction personnel will be notified of where the spill kits are located as part of the site induction and will be trained on the site procedures for dealing with spills.

In the event of a leak or accidental fuel spill in the field, the source of the spill will be fixed, and the fuel will be contained and cleaned as quickly as possible using the spill kits to contain and absorb the pollutant and prevent any further potential contamination. The absorbed pollutants and contaminated materials will be placed into leak proof containers and transferred to a suitable waste container for hazardous materials in the construction compounds. Where a leak has occurred from machinery, the equipment will not be permitted to be used further until the issue has been resolved. The incident will be reported to the Construction/Site Manager and Environmental Manager, and appropriate remediation will be carried out i.e. soil removal for safe disposal by licensed waste collectors.

The Environmental Manager (or equivalent appointed person) will be notified of any spills on-site and will determine the requirement to notify the authorities as set out in Section 5.3.2 (Incidents / Complaints).

### *5.1.7 Concrete Deliveries and Pouring*

Concrete is required for the construction of the turbine bases and foundations. After concrete is poured at a construction site, the chutes of ready mixed concrete trucks must be washed out to remove the remaining concrete before it hardens. Wash out of the main concrete bottle will not be permitted on site; wash out is restricted only to chute wash out. Wash down and washout of the concrete transporting vehicles will take place at an appropriate facility offsite.

The best management practice objectives for concrete chute washout are to collect and retain all the concrete washout water and solids in leak proof containers or impermeable lined wash

out pits, so that the wash material does not reach the soil surface and then migrate to surface waters or into the ground water. These will be located near the site entrance so that they are easily accessed when departing the turbine locations. The collected concrete washout water and solids will be emptied on a regular basis. Washout will be undertaken at the construction compounds.

Primarily ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. Localised mixing will be used for small tasks such as blockwork for building the substation. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks from large scale on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place.

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area. These residual liquids and solids will be collected by an appropriately licensed waste collector. Where temporary lined impermeable containment areas are used, such containment areas are excavated and lined with an impermeable membrane. This washout will be located near the site entrance and also at any significant concrete pour locations (e.g. at turbine hardstand during a foundation pour) so that it is easily accessed when departing.

General measures to prevent surface water contamination from concrete pouring on-site will include:

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast;
- Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete;
- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets;
- Ensuring that covers/mesh are available for freshly placed concrete to avoid the surface washing away in heavy rain;
- Disposal of surplus concrete after completion of a pour off-site; and
- Discussing arrangements for concrete deliveries with the suppliers before works commence to ensure they are aware of on-site wash-out restrictions.

### *5.1.8 Vehicle Washing*

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. Site roads will be already formed using on-site materials before other road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

However, in the interest of best practice and to avoid the potential for the transfer of alien invasive plant species into the site, it is proposed to install a self-contained wheel-wash system near the project site entrance. The drawings in EIAR Appendix 1-1 include details and proposed location of a proposed self-contained wheel-wash system which will be installed as part of the construction phase of works. Water will be supplied for this using a water bowser.

A road sweeper will be available if any section of the surrounding public roads becomes soiled by vehicles associated with the proposed project.

During the operational phase, the onsite access tracks will be maintained in good condition, and any vehicles that need to access the site will be generally keeping on these surfaces. As a result of this, and the low volume of traffic expected on site, it is not anticipated that a wheel washing facility would be required during the operational phase.

### *5.1.9 Directional Drilling*

Drilling fluid required for the directional drilling process will be used sparingly and only as required to avoid an excess and will be appropriately stored when not in use. The fluid used during the process is inert, natural and biodegradable (e.g. Clear Bore™). Should any excess drilling fluid occur, it will be contained and removed for disposal at a licensed waste facility. The duct will be positioned, and the launch and reception pits will be refilled.

Further details of this crossing method are provided in Appendix 1-1 of the EIAR; associated construction methodologies are discussed above in Section 4.1.5.3.

### *5.1.10 Peat/Spoil Management*

Topsoil and sub-soil are to be stockpiled separately. Turves will be stored turf side up and will not be allowed to dry out. Stockpiles are to be isolated from any surface drains and a minimum of 50 m away from watercourses and will be located at points along internal roads within the proposed wind farm site boundary. Measures such as interceptor ditches around the bases of these areas, sediment traps and seeding of the bunds will be incorporated to prevent runoff of suspended solids and soil erosion. No permanent spoil or stockpiles will be left on site.

The method for restoration of excavated or disturbed areas is to encourage stabilisation and early establishment of vegetation cover, where available, vegetative sods/turves or other topsoil in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.

A temporary peat deposition area will be set up on site for storage of peat that is excavated on site. It will be mainly used until the first borrow pit is fully excavated. Once all stone has been extracted, then it is proposed to place peat within the borrow pit to reinstate it. The temporary peat deposition area may be used throughout the construction phase of the project while waiting for availability of space in the onsite borrow pits.

To prevent erosion and run-off and to facilitate vegetation reinstatement, any sloped embankment will be graded such that the slope angle is not too steep and that embankments match the surrounding ground profile. Associated construction methodologies are discussed above in Section 4.1.8.

### *5.1.11 Works Near Waterbodies*

The construction works will involve some works within 50 m of streams (such as site access tracks and clearspan bridges). However, no instream works are proposed, and a suite of measures are in place to avoid any adverse effects on streams. Clear span bridges will be utililsed for stream crossings. Trees will be cut manually inside the 50 m buffer. During the near stream construction work, silt traps and a double row silt fences will be placed immediately down-gradient of the construction area for the duration of the construction phase.

Near-stream construction work will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document *"Requirements for the Protection of Fisheries Habitat during Construction*

*and Development Works at River Sites"*, that is, May to September inclusive, unless otherwise agreed. This time-period coincides with the period of lowest expected rainfall and, therefore, minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.

Runoff will be maintained at Greenfield (pre-development) runoff rates. The layout of the development has been designed to collect surface water runoff from hardstanding areas within the development and discharge to associated surface water attenuation lagoons adjacent to the proposed infrastructure. It will then be managed by gravity flow at Greenfield runoff rates.

It is proposed, that during the ground clearance of the proposed project, the contractor will implement water control measures to limit the effect on water quality using standards measures as set out in the Forestry Felling Report – EIAR Appendix 2-7. Brash will be used along harvesting and extraction routes for soil protection. The forwarder will be loaded to the manufacturer's maximum specification and no more to avoid overloading and unnecessary soil compaction.

Suspended solid (silt) removal features will be designed to have a minimum of three stages of treatment and will be implemented in accordance with CIRIA C697 SuDS Manual, and CIRIA C648 Control of water pollution from linear construction projects. Management of runoff will include the following:

- Filtration of water through filter media (sand / stone check dam, silt fence);
- Detention / settlement in settlement ponds or behind check dam in swales; and
- Conveyance of shallow depths of water in vegetated swale.

## 5.2 DUST SUPPRESSION / MANAGEMENT

There will be some temporary dust and exhaust emissions from construction activities during the construction phase.

The Contractor will have due regard to relevant guidance such as *The Control of Dust and Emissions during Construction and Demolition* published by the Greater London Authority (GLA) in 2014 and *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* published by the NRA (now TII) in 2011.

During the construction phase, dust or air pollutants generated from the proposed project will typically arise from:

- Movement of construction vehicles;
- Laying hardstanding areas and access tracks (i.e., roads);
- Transportation of turbines and construction materials to and within the site;
- Excavation and crushing of rock for use as a base material for internal roads and hardstanding areas;
- Excavation, movement and placement of soil stockpiles (excavated soils / fill materials); and
- Wind generated dust from stockpiles, exposed unconsolidated soils and roads.

Potential effects arising from dust and exhaust emissions will be minimised through the implementation of the following best practise measures:

- Minimisation of extent of working areas;
- Stockpiling of excavated materials will be limited to the volumes required to practically meet the construction schedule;

- Drop heights of excavated materials into haulage vehicles will be minimised to a practicable level;
- Daily inspections by site personnel to identify potential sources of dust generation along with implementation measures to remove causes where found;
- Provision of dust suppression measures (e.g. sweeps/covers/water bowsers) will be used on stockpiles and the road surface during periods of extended dry weather;
- If necessary, water will be taken from settling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compounds to prevent the generation of dust;
- Silty or oily water will not be used for dust suppression, because this will transfer the pollutants to the haul roads and generate polluted runoff or more dust;
- Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff;
- Traffic coming to site will only use the specified haul routes;
- Onsite borrow pits will be used to minimise quantities of stone material being brought to site;
- Best practice (including industry recognised dust suppression techniques/equipment) will be used to minimise the potential for dust production during the extraction of rock from the borrow pits and excavations elsewhere;
- Vehicles and plant will be routinely serviced to minimise the exhaust emissions during construction;
- Vehicles will not be left running unnecessarily and low emission fuels will be used where possible.

## 5.3 NOISE AND VIBRATION CONTROL

The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*[3].

The Environmental Manager, or equivalent, will supervise the works to ensure compliance with the noise and vibration limits set out in the Standards document referred above and the EIAR. The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise;
- Regular and proper maintenance of plant and machinery, will be employed to minimise the noise produced by on site operations;
- Plant with low inherent potential for generation of noise and/ or vibration will be selected where practicable;
- Noisy / vibratory plant will be placed as far away from sensitive properties as permitted by site constraints;
- Where practicable, all vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models, fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools will be fitted with suitable silencers;

[3] British Standards Institute (BSI), *BS 5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites* (2008)

- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen;
- Channels of communication will be established between the contractor/applicant, Local Authority, and residents;
- A site representative responsible for matters relating to noise and vibration will be appointed.

The rock will be extracted from the proposed borrow pits using two main methods: Rock breaking and rock blasting. Both methods would be suitable for use on this site considering the geology and soil conditions there, and it is proposed to use a combination of both.

Where rock breaking is employed, the following are examples of measures that will be considered, where necessary, to mitigate noise emissions from these activities:

- Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency;
- Ensure all leaks in air lines are sealed;
- Erect acoustic screen between compressor or generator and noise sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured;
- Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation.

Methods used to minimise effects of rock blasting may consist of some or all the following:

- Restriction of the hours within which blasting can be conducted (e.g., 09:00 – 18:00hrs);
- A publicity campaign undertaken before any work and blasting starts (e.g., 24 hours written notification);
- The firing of blasts at similar times to reduce the 'startle' effect;
- On-going circulars informing people of the progress of the works;
- The implementation of an onsite documented complaints procedure;
- The use of independent noise monitoring by external bodies for verification of results;
- Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.

## 5.4 WASTE MANAGEMENT

Best practice in waste management will be employed during all phases of the proposed project, with a view to reducing, reusing, recycling and recovering waste produced, in that order of preference. Waste disposal will be avoided where possible. The following sections outline the Waste Management Plan (WMP) and waste management practices associated with the proposed project, which will be in accordance with relevant provisions of the Waste Framework Directive (Directive 2008/98/EC on waste), the Waste Management Act 1996 as well as all other Irish and EU legislation.

### Waste Management Plan (WMP)

The main site contractor will ensure that all waste contractors have the correct permits for any waste streams they are removing from site, and that they are taking it to the appropriately licensed/permitted waste facilities. They will also ensure that all parts of the WMP will be implemented onsite.

All waste generated from the construction phase will be managed in accordance with the provisions of the Waste Management Act 1996 as amended and associated Regulations. In line with good industry practice, the following measures will be implemented on site by the appointed Contractor for the duration of construction:

- Ensure all excavated topsoil and subsoils will be reused within the site boundary, insofar as possible, primarily for reinstatement of the borrow pits. Any excess material which cannot be reused in creating berms or reinstating the borrow pits will be transferred off-site to a licensed waste facility. Similarly, any excess or unsuitable rock material which cannot be reinstated in the borrow pits will be transferred off-site. However, it is not anticipated that any excess material will not be suitable for reuse within the site;
- Ensure that any excess material which cannot be reused will be transferred off-site to a suitable licensed waste facility. Similarly, any excess or unsuitable soil / rock material which cannot be reinstated will be transferred off-site. However, it is not anticipated that any excess material will not be suitable for reuse within the site;
- Ensure typical waste streams (such as metals, paper, cardboard, plastics, wood, rubber, textiles, bio-waste, packaging, WEEE (electronic waste, batteries, accumulators and construction waste) will be managed, collected, segregated and stored in separate area(s) at the site before being removed off site by a licensed waste management contractor at regular intervals for the duration of the construction works;
- Provide skips and bins of appropriate sizes onsite in a designated area(s) and used to maximise source segregation of waste materials. This will include food and packaging waste from canteen and welfare facilities. Appropriate control of food waste in the compound will minimise the potential for pests and rodents to visit the area;
- Any contaminated materials used for spills and equipment maintenance works will be separately stored in a suitable container for collection by the appointed authorised hazardous waste contractor(s);
- Encourage all staff to minimise waste generation and to maximise the segregation of waste at source. Material wastage will be avoided by delivering only the required quantities of material to site and utilising off-site manufacturing of materials as much as possible;
- Establish ‘just-in-time deliveries to avoid excess material storage at the site which can lead to waste generation. Delivery drivers will be encouraged to remove any excess packaging from materials delivered to site and remove unused timber pallets where possible;
- Reusable formwork for concrete pouring will be used where possible, in preference of non-reusable options. Other opportunities for material reuse across the site will be sought by the appointed Contractor;
- Due to the current nature / use of the site (commercial forestry / agriculture), it is not anticipated that there will be contaminated soils or materials encountered during the excavation works. No contaminated soils were identified during the site investigation works.
- It is noted that illegal dumping is common in large forestry areas and may be encountered at the time of construction. Where illegal dumping is discovered, appropriate communication and measures will be taken to try and identify the source of the illegal waste. The appropriate authorities will be notified, and the materials will be removed from site by authorised waste collection contractors and transferred to suitably licensed waste facilities:

- The Environmental Manager, or other appropriate person, will be designated by the appointed Contractor as the Waste Manager for the duration of the project in accordance with the general guidance set out in the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*[4], published by the EPA in November 2021;
- At the pre-construction stage, the Waste Manager will be in a position to require fellow designers to take full advantage of all reasonable C&D waste prevention, reuse and recycling opportunities;
- During construction, the practicalities of waste prevention, salvaging re-useable materials, and the need to synchronise the recycling of waste materials through the timing of their use in the new construction works will be emphasised by the appointed Waste Manager.

### *5.4.1 Vehicle Management*

Vehicles will be kept on site access roads for the vast majority of the construction phase, however in the initial construction phases, there will be some requirement for off-road vehicle movements (for forestry felling, ground works, etc.). For forestry felling, standard practices and equipment/vehicles will be used (as described in the Forestry Report – see EIAR Appendix 2-7).

For ground works and other off-road activity, the use of specialist vehicles that are tracked or use large low ground pressure tyres or bog mats which distribute their weight evenly across a large surface area will be used. These will minimise ground disturbance, particularly where there is a presence of peat (albeit very shallow on this site) and therefore minimise the risk of sediment entering downstream watercourses.

All vehicles will be restricted to the areas where works are required, and unnecessary off-road movements around the wider site will be avoided. Where there are any sensitive habitats present around a proposed work area, these areas will be marked out so that vehicles will not enter and damage them.

### *5.4.2 Traffic Management*

As described further in Chapter 16 of the EIAR, Traffic and Transport, the successful completion of this project will require significant co-ordination and a comprehensive set of mitigation measures will be put in place before and during the construction and operational phase of the project. A Traffic Management Plan proposed for the project is included as EIAR Appendix 2-4.

# 6.0 ENVIROMENTAL EMERGENCY RESPONSE PLAN / PROCEDURES

## 6.1 HAZARD IDENTIFICATION

In order to establish the type of potential emergencies that may occur, the hazards outlined in Table 5.1 have been identified as being potential situations that may require an emergency response they occur.

[4] EPA *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* (November 2021) - https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf (26 August 2022)

*Table 6.1: Potential Hazards Identified*

| Hazard Type | Emergency Incident |
|---|---|
| Plant / Machinery/tools causing damage | Accident resulting in injury / power failure / loss of critical infrastructure |
| Spillages / Leaks | Accidental spill / leak leading to significant environmental contamination |
| Flooding | Accident leading to injury / damage to site infrastructure |
| Severe Weather | Accident leading to injury / damage to site infrastructure |
| Fire / Explosion | Accident leading to injury / damage to site infrastructure |
| Turbine Collapse | Accident leading to injury / damage to site infrastructure |
| Peat Stability | Excessive movement of peat on-site / onset of peat slide leading to: accident / injury / damage to site infrastructure |
| Landslide | Accident leading to injury / damage to site infrastructure |
| On-site/Construction Traffic – plant/machinery and construction vehicle movements | Traffic accident leading to injury / damage to site infrastructure |
| Wind Turbine Rotational Failure | Accident leading to injury / damage to site infrastructure |

## 6.2 ENVIRONMENTAL EMERGENCY RESPONSE PROCEDURES

Every effort will be made to prevent environmental emergencies and incidents during the construction and operational phase of the project.

The Contractor will be responsible for developing a detailed environmental Emergency Response Plan (ERP) for the proposed construction works, environmental emergencies, as part of the H&S Plan.

This ERP will be activated in the event of an environmental emergency such as an a fire, spillage, structure collapse etc. and will provide details on who is required to be notified etc. The ERP will also include details of all personnel inducted and authorised to work on the site.

In the event of an environmental emergency, the Environmental Manager, ECoW and Project Manager will be notified immediately and will determine the scale of the emergency and the requirement for the assistance of emergency services. Works will cease in the area of the incident and contact will be maintained with the emergency services to direct them to the scene of the incident as required.

If necessary, the Environmental Manager, with support from the ECoW will inform the appropriate regulatory authority depending on the nature of the incident. Details of the incident will be recorded (e.g. cause, extent, actions and remedial measures).

A record of all environmental incidents will be kept on file by the Environmental Manager. These records will be made available to the relevant authorities if required.

Furthermore, the Environmental Manager and ECoW will be responsible for outlining corrective actions required and will advise the Contractor and Project Developer Teams as appropriate.

The ERP must include contact names and telephone numbers for the relevant local authorities (all sections/departments) including ambulance, fire brigade, An Garda Siochána and the HSA. Reporting of environmental emergencies to the local authority will be required as well as other relevant stakeholders such as IFI, NPWS or the EPA.

### 6.2.1 ECoW Responsibilities

During construction there will be occasions when the ECoW will be required to rapidly respond to unplanned events such as any wildlife incidents, pollution incidents, etc.

The ECoW will have a very specific role within the emergency response teams responding to these incidents.

The ECoW will also be expected to support the project team in resolving any other unplanned events that are not classified as emergency responses or incidents.

### 6.2.2 Site Evacuation and Fire Drills

A site evacuation/fire drill procedure will be developed to provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. At induction, all personnel will be made aware of the evacuation procedure. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specific intervals and maintaining records of such drills. The details of this procedure will be finalised in the Contractor's CEMP at construction stage and will include:

- Details regarding the notification of emergency situations to all those on site including use of a siren/horn to notify all personnel;
- Details of assembly point(s) and signage;
- Details of the roll call procedure to account for all personnel on site;
- Communication process between the Site Security Officer and the Site Manager during the procedure (i.e. notification of roll count etc.);
- Course of action to be undertaken by the Site Manager.

#### Spill Response and Control

A detailed spill response and control procedure will be developed and finalised in the Contractor's CEMP at construction stage, outlining the steps that will be followed in the event of an oil / fuel spill occurring, including:

- Identification and blocking of the source of the spill;
- Alerting personnel in the vicinity of the spill and any possible dangers;
- Elimination of any potential ignition sources in the vicinity of the spill;
- Spill containment approach and spill control materials;
- Covering or bunding off of any vulnerable areas where appropriate (i.e. drains, streams, sensitive habitats);
- Clean up using the spill control materials;
- Containment and disposal of used spill control materials;
- Communication with the ECoW – providing relevant information on the location, type and extent of the spill so that they can take appropriate action;
- ECoW actions including inspection of the site, making certain necessary measures are in place to manage the spill and prevent further spillage;
- ECoW notification to the appropriate regulatory body if necessary.

#### Excessive Peat Movement

The predominant land use/activities on the site of the proposed wind farm are commercial forestry, with some areas of open peatland (grazed at a low intensity). However, a detailed procedure will be developed and finalised within the Contractor's CEMP at construction stage outlining the steps to be followed in the event of excessive or continuing peat movement being

recorded or identified, including details on suspension of construction activities within the affected area, increasing monitoring activity at the identified location; limited construction activity beginning again only once there has been a cessation of movement and a geotechnical risk assessment having been undertaken by a geotechnical engineer.

Peat Slide

A detailed procedure will be developed and finalised within the Contractor's CEMP at construction stage outlining the steps to be followed in the event of the onset of or detachment of peat onsite, which will include details regarding, alert of peat slide, cessation of construction, diversion of resources, mitigation procedures, actions to prevent a peat slide reaching watercourses via on-land prevention measures (e.g. installation of check barrages), watercourse check barrages, stabilisation by rock infill where applicable/required. The procedure will also detail assessment requirements to be undertaken by the geotechnical engineer and stabilisation procedures implemented, as well as monitoring, as appropriate, until such time as movements have stopped.

### *6.2.3 Incidents / Complaints*

All safety or environmental incidents associated with the project will be reported and investigated in line with the ERP. Typically, the following procedures will be followed in the event of an incident:

- Works will stop immediately where safe to do so;
- The Environmental Manager will be contacted;
- The size of the incident will be assessed and determined if it can be controlled by site staff or if emergency services are required to attend;
- The appropriate enforcing authority will be contacted;
- The Environmental Manager will investigate after the incident;
- The findings will be sent to the appropriate authority; and
- An action plan will be prepared to set out any modifications to working practices required to prevent a recurrence.

This section sets out a procedure to manage and resolve any complaints received from members of the public during the construction phase of the proposed project. The following measures will be adopted and refined, as necessary, taking account of any relevant planning conditions.

The following measures will be implemented to deal with complaints and the Contractor's CEMP will contain more specific details with regard to phone numbers to contact:

- Clearly display a notice board at the site entrance so that the public know whom to contact if they have a complaint or comment;
- Personnel on site, including sub-contractors are required to perform their duties in accordance with this CEMP, and in such a way as to minimise the risk of complaints from third parties;
- All complaints received regarding the construction works will be recorded and categorised (e.g. noise, property damage, traffic, dust etc.) within a central Site Complaints Log. This complaints log will include the following key details:
    - Name, address and contact details of the complainant (with the complainant's permission);
    - Brief outline of the complaint;
    - Date of Complaint;
    - Name of person receiving complaint details; and
    - Agreed timeline for response to complaint.

- All complaints will be communicated to the Project Manager and the Project Developer immediately;
- All complaints will be followed up and resolved in so far as is practicable; and
- The complainant, Project Developer and other stakeholders will be kept informed of the progress in resolving the complaint.

## 6.3 EMERGENCY CONTACT DETAILS

A list of emergency contacts is presented in Table 5.2 below. A copy of these contacts will be included in the Site Safety Manual and in the site offices and the various site welfare facilities.

*Table 6.2: List of Emergency Contacts*

| Contact | Telephone |
|---|---|
| Emergency Services – Ambulance, Fire, Gardaí | 112 / 999 |
| Local Garda Station – Cappoquin | +3535854244 |
| Local Fire Service[5] | 999 or 112 |
| Local Doctor / GP Service – Littlebridge Surgery | 058 76970 |
| Local Doctor / GP Service – Fourmilewater Health Centre | 052 6136363 |
| Cappoquin Health Centre | 058 54406 |
| Waterford Regional Hospital | (051) 848 000 |
| ESB Faults / Emergencies | 1850 372 999 |
| Gas Networks Ireland 24hr Emergency Line | 1850 20 50 50 |
| Site Manager / Construction Manager / Site Supervisor | TBC |
| Client: Scart Mountain Wind Farm Limited | TBC |
| Ecological Clerk of Works (ECoW) | TBC |
| Environmental Manager | TBC |
| Project Supervisor Design Stage (PSDS) | TBC |
| Project Supervisor Construction Stage (PSCS) | TBC |
| Health and Safety Authority Ireland (HSA) | TBC |
| Inland Fisheries Ireland (IFI) | TBC |
| Project Ecologist | TBC |
| Project Hydrologist | TBC |
| Project Geotechnical Engineer / Geologist | TBC |
| Project Archaeologist | TBC |

## 6.4 EMERGENCY COMMUNICATION PROCEDURE

The Contractor's CEMP will be updated with an agreed Emergency Communication Response Procedure following appointment of the Contractor.

## 6.5 INDUCTION CHECKLIST

Table 5.3 below provides a list of items highlighted in the Emergency Response Procedure (ERP) which must be included in the induction or gathered from all personnel that will work on the proposed project during the mandatory site induction. This will be revised throughout the various stages of the project. This list will be updated and expanded on within the Contractor's CEMP.

[5] Waterford City & County Council : Waterford Fire Service (waterfordcouncil.ie)

*Table 6.3: Site Induction Checklist*

| Emergency Response Plan – Site Induction Items TBC | Status |
|---|---|
| Site Induction (all personnel must undergo the site induction prior to commencing work on-site) | |
| All personnel must be made aware of site evacuation and fire drill procedures | |
| All personnel must be made aware of the spill response and control procedure | |
| All personnel must be made aware of environmental incident procedures | |
| All personnel must be made aware of procedures relating to peat movement and peat slides | |
| All personnel must be made aware of incident and complaints procedures | |
| All personnel must be made aware of the emergency communication procedure and Emergency Contact Details for the project | |
| All personnel must be made aware and have access to the Site Safety Manual | |
| All personnel must be made aware of the personnel tracking procedure and provide their contact details at induction | |
| TBC | |
| TBC | |
| TBC | |

# 7.0 MITIGATION MEASURES AGREED

All mitigation measures relating to the pre-construction and construction phases of the proposed project were set out in the various sections of the EIAR, and NIS prepared as part of the planning application.

This section of the CEMP groups together all of the mitigation measures presented in the EIAR and NIS respectively. The Mitigation Measures are outlined in the table in the following pages.

By presenting the mitigation measures in this format, it is intended to provide a review list that can be easily checked and reported on during the future phases of the project. The use of a table to present the information will be further expanded upon over the course of the proposed project and will provide a template for use during site compliance audits.

*Table 7.1: Table of Mitigation Measures*

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| **Pre-construction Phase** | | | |
| **Description of Proposed Project** | | | |
| MM1 | Environmental Management – CEMP | EIAR Chapter 2 | A CEMP has been prepared for the proposed project. The CEMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the planning authority for written approval.<br>The construction contractor will be responsible for implementing the mitigation measures specified in the EIAR and CEMP and for communicating the requirements with all staff on-site. Their implementation of the mitigation measures will be overseen by the supervising Environmental Manager, ecologists, archaeologists and/or geotechnical engineers, as appropriate. |
| MM2 | Health and Safety | EIAR Chapter 2 | A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared prior to the construction stage.<br><br>A Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations. |
| MM3 | Surface Water Drainage System | EIAR Chapter 2 and Chapter 9 | The surface water drainage system will require weekly and daily inspections depending on the construction phase works to ensure that it is working optimally. Settlement ponds will require regular inspection and cleaning where sediment collects. The drainage and treatment system for the proposed wind farm monitored more frequently during/after heavy rainfall events during the construction phase. A programme of inspection and maintenance will be designed and dedicated construction personnel assigned to manage the inspection programme. This is discussed further in the CEMP. |
| MM4 | Traffic Management | EIAR Chapter 2 and Chapter 16 | A Traffic Management Plan (TMP) has been prepared for the proposed project and is included as Appendix 2-4 of the EIAR. This is a living document and will be updated ahead of construction to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by An Bord Pleanála, in the event planning permission/approval is granted.<br><br>Also, a confirmatory survey of road condition, including the condition of all road water crossings on the route, will be carried out along the proposed grid connection route (GCR) in advance of any works. |
| **Biodiversity** | | | |
| MM5 | Biodiversity: Otter | EIAR Chapter 6 / NIS | A Pre-construction Otter survey will be undertaken no more than 10—12 months in advance of the construction works as per the advice in the NRA (2008) guidelines, particularly at the directional drilling and clear-span bridge locations. In the event that a new |

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| | | | holt (established within the interim period) is identified within the footprint of the works during the pre-construction survey, a method statement will be prepared detailing survey / monitoring methods, if required, and any mitigation will be applied.<br>The method statement will also be used to support a licence application to the NPWS licensing unit if a licence to disturb is required. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works. |
| MM6 | Biodiversity: Badger | EIAR Chapter 6 / NIS | A pre-construction badger survey will be carried out prior to site clearance or works commencing. In the event that a new sett is discovered within the footprint of the construction works appropriate measures such as exclusion zones or sett exclusions will be carried out following industry methods. A method statement will be prepared detailing survey / monitoring methods, if required, and any mitigation to be applied.<br>The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works. |
| MM7 | Biodiversity: Common Frog | EIAR Chapter 6 / NIS | Common Frog will be surveyed during the appropriate season in advance of any works at drainage ditches, slow flowing streams and ponds where the Common Frog may spawn. Suitable breeding habitat such as pools, ponds and drainage ditches within the project site were noted during the baseline surveys and will inform the pre-construction survey.<br>A method statement will be prepared to detail specific measures to translocate the frogs and spawn, by hand or net, to suitable nearby habitat (to be identified prior to carrying out the survey) that will not be impacted by the proposed project. The method statement will be used to inform the application to NPWS for a licence to capture and relocate spawn and Frogs. |
| MM8 | Biodiversity: Common Lizard | EIAR Chapter 6 / NIS | Common Lizard will be surveyed during the appropriate season (March to October) in advance of any works at suitable habitat for the species. The survey work will focus on the peatland habitats at Knocknanask and Knocknasheega as these are suitable for use by the species.<br>A method statement will be prepared to detail specific measures to translocate Common Lizard within the footprint of the works to similar habitat a sufficient distance away from the works. The method statement will be used to inform the application to NPWS for a licence to capture and relocate Common Lizard. |
| **Ornithology** | | | |
| MM9 | Construction Disturbance Mitigation | EIAR Chapter 7 | Breeding bird surveys will be carried out in the breeding season preceding the start of construction, and in every subsequent breeding season across the duration of the construction period. These surveys will include Hen Harrier surveys and Snipe surveys. |
| | | | The survey methods will follow those used for the breeding raptor and breeding distribution surveys in 2023 and 2024 (see Appendices 7-4 and 7-5 of the EIAR). |
| | | | If nesting Hen Harriers are found, an assessment will be carried out by a suitably experienced ornithologist to determine the restrictions to construction work that will be required. This will start from the basis a potential 1 km disturbance distance (Goodship and Furness, 2022). However, depending on the location of the nest site, some lower magnitude construction work may be possible within 1 km without causing any disturbance. |
| | | | If breeding Snipe are found, no construction work will take place within 500 m of the nest site, or the centre of the territory if the nest site is not found. |

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| | | | If other sensitive breeding species are found, appropriate mitigation will be implemented based on evidence about their disturbance distances. |
| **Material Assets** | | | |
| MM10 | Underground Services | EIAR Chapter 11 | A confirmatory survey of all existing services (electrical/ESB, water/Uisce Éireann, gas/Gas Networks Ireland (GNI)) will be carried out prior to construction to verify the assumptions in this report and identify the precise locations of any services. The Applicant will liaise with the service provider where such services are identified. Digging around existing services, if present, will be carried out as per best practice/guidance by hand to minimise the potential for accidental damage. |
| MM11 | Telecommunications | EIAR Chapter 11 | In order to ensure there are no issues at construction, all telecom operators will be contacted in advance of construction to check that they have no new links in operation at that time. |
| **Archaeology** | | | |
| MM12 | Archaeological Investigations: Test Trenching / Metal Detection | EIAR Chapter 15 | The proposed TDR, where it passes through 220 m of greenfield, will be subject to a programme of archaeological test trenching and metal detection, prior to the commencement of construction. These investigations will be carried out under licence to the National Monuments Service of the DoHLGH. Dependant on the results of the assessment and if archaeological remains are identified, further mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require agreement from the National Monuments Service of the DoHLGH. |
| **Traffic and Transport** | | | |
| MM13 | Traffic: Pre-Construction Condition Survey | EIAR Chapter 16 | A pre-condition survey of roads on approach to the site will be carried out prior to construction commencement to record the condition of the road. |
| **Construction Phase** | | | |
| **Description of Proposed Project** | | | |
| MM14 | Forestry Felling | EIAR Chapter 2 | With the exception of commercial forestry felling, vegetation clearance will commence outside the breeding birds season, which runs from the 1st of March to the 31st of August. If any minor clearance or trimming is required within those dates, or if the initial vegetation clearance extends past the 1st of March due to unsuitable weather conditions, the works will be preceded by an ecological survey (from a qualified and suitably experienced ecologist) to ensure there are no sensitivities associated with the action. |
| MM15 | Construction Hours | EIAR Chapter 2 | The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations will generally be restricted to between 7:00hrs and 19:00hrs Monday to Friday (excluding public holidays) and between 07:00hrs and 14:00hrs on Saturdays. However, during the following critical periods longer hours will be required:<br>• Concrete pours for turbine foundations;<br>• During turbine installation when the weather is suitable (i.e. light winds);<br>• Delivery of oversized loads;<br>• In the unlikely event of an emergency (this is unlikely - see Chapter 17 of the EIAR (Major Accidents and Natural Disasters)).<br>Any such out of hours working will be agreed in advance with Waterford City and County Council apart from in the case of an emergency and in line with the Schedule of Mitigation requirements of this EIAR (Chapter 19). . |

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| MM16 | Surface Water Drainage / Silt Control | EIAR Chapter 2 | A Surface Water Management Plan (SWMP) has been prepared (Appendix 2-10 of the EIAR). The purpose of this plan is to ensure that all works are conducted in an environmentally responsible manner so as to minimise any potential adverse impacts from the proposed project on surface water quality. The plan incorporates the following specific objectives:<br>• Provide overall surface water management principles and guidelines for all phases of the proposed project;<br>• Address erosion, sedimentation and other water quality issues; and<br>Present measures and management practices for the prevention and/or mitigation of potential downstream impacts. |
| MM17 | Concrete Deliveries & Pouring | EIAR Chapter 2 | Primarily ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. Localised mixing will be used for small tasks such as blockwork for building the substation. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks from large scale on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place. The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area. These residual liquids and solids will be collected by an appropriately licensed waste collector. Where temporary lined impermeable containment areas are used, such containment areas are excavated and lined with an impermeable membrane. This washout will be located near the site entrance and also at any significant concrete pour locations (e.g. at turbine hardstand during a foundation pour) so that it is easily accessed when departing. An example of a concrete washout is shown in Figure 2-11 OF Chapter 2 of the EIAR.<br>Although unlikely to happen any disposal of surplus concrete after completion of a pour will be off-site at the concrete production facility. Localised mixing of concrete for blockwork, etc. will only be carried out as needed, but any small volume of surplus will be disposed of in the concrete washout area.<br>The CEMP provides further details of best practice and environmental considerations in relation to concrete deliveries and concrete pouring. |
| MM18 | Refuelling | EIAR Chapter 2 | Any easily manoeuvrable road-going vehicles (i.e. cars, jeeps, lorries etc) will be refuelled off-site. For any vehicles which are slow moving or tracked or those for whom regular trips off-site to refuel will not be practical, on-site fuelling will be required. |
| | | | A limited amount of fuel will need to be stored on the site within the construction compounds for this purpose, and this will be within a double skinned and bunded mobile tank which can be moved around the site using a 4x4 vehicle to refuel. This will be stored in the construction compound when not in use. |
| | | | A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the tank at all times. The drip tray and fuel absorbent mats will be used at all times during refuelling. Similar spill kits will be stored in each construction compound, and at the on-site substation in case of emergency. |
| | | | No refuelling will be carried out within 50m of a stream. Only designated trained and competent operatives will be authorised to refuel plant on site. |
| | | | In the event of an accidental fuel spill, the source of the spill will be fixed, fuel will be contained and cleaned as quickly as possible using the fuel absorbent material in the spill kits. The incident will be reported to the site manager and Environmental Clerk of Works, and appropriate remediation will be carried out (i.e. soil removal for safe disposal at a licensed waste facility by licensed waste collectors. |

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| | | | The CEMP provides further details of best practice and environmental considerations in relation to refuelling. |
| MM19 | Dust Suppression | EIAR Chapter 2 | In periods of extended dry weather, dust suppression will be necessary along haul roads and along the site roads to ensure dust does not cause a nuisance to any residential properties long the route. If necessary during a period of extended dry weather, water will be taken from settling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this will transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water would lead to increased risk of runoff. The CEMP provides further details of best practice and environmental considerations in relation to this. |
| MM20 | Waste Management | EIAR Chapter 2 | The CEMP provides an overview of the best practice in waste management during all phases of the proposed project, with a view to reducing, reusing, recycling and recovering waste produced, in that order of preference. Waste disposal will be avoided where possible. The Waste Management Plan and waste management practices associated with the proposed project are provided in the CEMP and will be in accordance with relevant provisions of the Waste Framework Directive (Directive 2008/98/EC on waste), the Waste Management Act 1996 as well as all other Irish and EU legislation. The main site contractor will appoint a Environmental Clerk of Works who will ensure that all waste contractors have the correct permits for any waste streams they are removing from site, and that they are taking it to the appropriately licensed/permitted waste facilities. They will also ensure that all parts of the Waste Management Plan will be implemented onsite. |
| MM21 | Vehicle Management | EIAR Chapter 2 | Vehicles will be kept on site access roads for the vast majority of the construction phase, however in the initial construction phases, there will be some requirement for off-road vehicle movements (for forestry felling, ground works, etc.). For forestry felling, standard practices and equipment/vehicles will be used (as described in the Forestry Report – see Appendix 2-7 of the EIAR). |
| | | | For ground works and other off-road activity, the use of specialist vehicles that are tracked or use large low ground pressure tyres or bog mats which distribute their weight evenly across a large surface area will be used. These will minimise ground disturbance, particularly where there is a presence of peat (albeit very shallow on this site) and therefore minimise the risk of sediment entering downstream watercourses. |
| | | | All vehicles will be restricted to the areas where works are required, and unnecessary off-road movements around the wider site will be avoided. Where there are any sensitive habitats present around a proposed work area, these areas will be marked out so that vehicles will not enter and damage them. |
| MM22 | Vehicle Washing | EIAR Chapter 2 | Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. Site roads will be already formed using on-site materials before other road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.<br>However, in the interest of best practice and to avoid the potential for the transfer of alien invasive plant species into the site, it is proposed to install a self-contained wheel-wash system near the project site entrance. The drawings in Appendix 1-1 include details and proposed location of a proposed self-contained wheel-wash system which will be installed as part of the construction phase of works. Water will be supplied for this using a water bowser. A road sweeper will be available if any section of the surrounding public roads becomes soiled by vehicles associated with the proposed project. The CEMP provides further details of best practice and environmental considerations in relation to this.. |
| MM23 | Spoil Management | | The use of the borrow pits will be phased. This will allow materials to be permanently placed in the first borrow pit while the second is in use, thereby minimizing the volume of soils requiring temporary storage. In order to further reduce temporary storage |

| Ref No. | Related to | Location | Mitigation Measure |
|---|---|---|---|
| | | EIAR Chapter 2 | requirements, soils and turves will be reinstated around infrastructure as part of restoration and landscaping works. This will be carried out during the construction phase, as soon as is practical after the completion of the works in any one area of the site. |
| | | | Where the proposed project footprint is located on any mineral-based soil, this material will be side-cast and profiled as close to the excavation areas as practical. In the case of peat, or where other adjacent infrastructure or constraint features might prevent side-casting, it will be used to reinstate the borrow pits. The sides of the excavated areas will be battered/sloped sufficiently to ensure that slippage does not occur (2:1 for mineral soil). The excavated sidecast material will be smoothed with the back of an excavator bucket and surrounded by silt fences to minimise the potential for sediment-laden run-off occurrence. Side-casting will not occur within 50m of a watercourse. The side-cast material will be used later in backfilling the working area around the turbine foundations, or for landscaping locally or reinstatement elsewhere on site (such as the borrow pits). Further and more detailed information on the spoil management is provided in Appendix 2-3 of the EIAR (Spoil & Peat Management Plan). |
| | | | Where side-casting is not possible, topsoil and sub-soil are to be stockpiled separately. Turves will be stored turf side up and will not be allowed to dry out. Stockpiles are to be isolated from any surface drains and a minimum of 50m away from watercourses, and will be located at points with easy access to internal roads within the proposed borrow pit areas which have not yet been extracted. Measures that will be employed will include interceptor ditches around these areas (with sediment traps within these (see Drainage Drawings 11303-2040, 11302-2041 and 11303-2042 in Appendix 1-1 of the EIAR) deployment of double silt curtains and seeding of the piles will be incorporated to prevent runoff of suspended solids and soil erosion. No permanent spoil or stockpiles will be left on site. No stockpiles will be located on peat areas. Peat material (from Knocknanask in particular) will be used to reinstate the borrow pits (see Section 2.8.8 and Appendix 2-3 for information on sequencing of work). |
| | | | Where available, vegetative sods/turves or other topsoil in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface. Where sods/turves are not available, some seeding with native species will be carried out. This method for restoration of excavated or disturbed areas is to encourage stabilisation and early establishment of vegetation cover. |
| | | | To prevent erosion and run-off and to facilitate vegetation reinstatement, any sloped soil embankment will be graded such that the slope angle is not too steep (i.e. 1:3) and that embankments match the surrounding ground profile. See Section 2.8.9. for further information on sequencing and spoil management. |
| | | | Management of spoil for the turbine delivery accommodation works and the GCR are discussed in sections 2.8.2 and 2.8.5 OF Chapter 2 of the EIAR respectively. |
| MM24 | Health and Safety | EIAR Chapter 2 and Chapter 5 | The proposed project will be constructed in accordance with all relevant Health and Safety Legislation as described in the CEMP. |
| | | | The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations. |
| | | | The PSDP and PSCS appointed for the project will be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations as described in the CEMP. |
| **Population and Human Health** | | | |
| MM25 | Health and Safety | EIAR Chapter 5 | All activities carried out by the appointed Contractor on the proposed project will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act. The CEMP sets out the Health and Safety requirements for the project including the erection of fencing, signage and notification of commencement of works to the Health and Safety Authority (HSA). This will apply to whatever final turbine dimensions are chosen from the entire proposed range of turbine dimensions. |

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| | | | The proposed TDR to allow for the transport of the turbines to the proposed wind farm site will involve some works as discussed in Chapter 2 of the EIAR (Description of the Proposed Project). These works will be carried out to the relevant construction and road safety guidelines. When the turbine components are being transported, they will have a Garda escort, and will be carried out at night when there is less traffic on the road. The proposed turbine delivery works allow for the entire range of proposed turbine dimensions. |
| | | | The project will employ all of the latest and relevant guidelines and legislation (See CEMP in terms of health and safety both for works within the proposed wind farm site as well as for works outside the main wind farm such as those on the proposed TDR). The required levels of safety (e.g. during road works) will be maintained for all road users as well as pedestrians. The proposed wind farm site itself will not be open to the public. Public access will be restricted to works areas outside the proposed wind farm site such as the proposed TDR works areas and the proposed GCR while work is underway. Appropriate health and safety measures as described in the CEMP will be taken for all works areas during the construction phase in the interest of worker and public safety also. Should any public health advice be in place during the construction phase (such as the recent Covid-19 public restrictions) these will be implemented on site. |
| **Biodiversity / Ecology** | | | |
| MM26 | European Sites | EIAR Chapter 6 / NIS | Mitigation measures protecting surface water quality will ensure the protection of the Blackwater River (Cork/Waterford) SAC, Dungarvan Harbour SPA and the Blackwater Estuary SPA during the construction phase are outlined in Chapter 9 – Hydrology and Hydrogeology, Section 9.5 and Section 7 of the NIS which is contained in the Planning Application. |
| MM27 | Proposed Natural Heritage Areas | EIAR Chapter 6 / NIS | Mitigation measures protecting surface water quality which will ensure the protection of the Blackwater River and Estuary pNHA and Dungarvan Harbour pNHA during the construction phase are outlined in Section 9.5 of Chapter 9 – Hydrology & Hydrogeology and Section 7 of the NIS which is contained in the Planning Application. |
| MM28 | Biodiversity: Habitats | EIAR Chapter 6 / NIS | All mitigation measures associated with the protection of water quality are outlined in Chapter 9 – Hydrology and Hydrogeology Section 9.5 and within the SWMP will be implemented, which will ensure the protection of the eroding/ upland river habitats located within or hydrologically connected to the proposed project. |
| | | | Sediment runoff at clear span bridge and directional drilling sites:<br>• No instream works will take place during all phases of the proposed project.<br>• Silt fences will be erected along all areas where the construction works are within 20m of a stream or river and 10m around stockpiled material. All silt fences will be erected outside of flood zones. The silt fencing will remain in position during the full construction phase of the project.<br>• Silt fences (woven, high tensile strength heavy porous filter fabric) will be used. No mesh type silt fences will be permitted. Silt fencing will be installed as per the manufacturer's guidelines (the bottom section buried at least 10cm deep) prior to any ground disturbance works.<br>• The excavated subsoil will be utilised on site and used to create bunds around the proposed facilities to create surface water runoff barriers. |

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| | | | • Excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning or higher in place or 5-mm in a 1-hour period).<br>• A minimum 10m untouched vegetated buffer zone will be retained between the silt fence and the watercourse.<br>• No permanent storage of excavated material will be permitted within 50m of the any watercourse within the proposed project or within 10m from drainage ditches;<br>Construction pollution control at clear span bridge and directional drilling sites:<br>• Spill-kits and hydrocarbon absorbent mats will be stored in the cabin of all construction vehicles. All machine operators and site staff must be fully trained in the use of this equipment.<br>• All machinery will be regularly maintained and checked for fuel, oil or hydraulic fluid leaks.<br>• Servicing of machinery will only be undertaken within the construction compound or offsite. |
| | | | A total of 0.33ha of Annex I dry heath will be lost to the development on Knocknanask and Knocknasheega. To compensate for this loss, restoration and enhancement measures will be implemented as detailed in the Biodiversity Management Plan (BMP) which is included in Appendix 2-1 of the EIAR. |
| | | | Vegetation clearance will be kept to a minimum to prevent unnecessary habitat loss where works are to be carried out within dry heath habitat, especially in areas of Annex I habitat. |
| | | | The proposed construction work areas will be demarcated prior to the construction works commencing, to minimise the footprint of the works within dry heath habitat. No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed project. |
| | | | Suitably sized access / bog mats will be used where appropriate to mitigate rutting on soft or wet ground and reduce soil erosion. |
| | | | All plant vehicles will be restricted to designated areas and access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks. |
| | | | No access will be permitted to the areas of blanket bog habitat, especially the small area of intact priority Blanket Bog located 100m to the southeast of Turbine no. 5.<br>Suitably sized drainage pipes will be perpendicularly placed under the road to ensure the hydrological link between blanket bog habitat on the upper and lower mountain side is maintained.<br>Measures that will benefit the enhancement of the degraded blanket bog in the upland areas of Knocknanask are further described in the BMP, Appendix 2-1 of the EIAR. |
| | | | A Dust Management Plan has been prepared and in included as an Appendix in Chapter 14 of the EIAR (Air Quality & Climate). The Plan outlines dust suppression measures which will be implemented during the construction phase which will ensure the protection of habitats. |
| | | | Areas to be cleared / felled will be demarcated prior to the works commencing, to ensure vegetation clearance is kept to a minimum. If vegetation / hedgerows are to be cleared / trees to be felled within the bird nesting season, it is recommended that the trees are |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | first surveyed for the presence of bird nests. Where a nest is found, and if feasible, the tree will be cornered off until the chicks have fledged or until nesting has failed.<br><br>Following the removal of the proposed TDR turning bay (which will result in the loss of 70m of hedgerow) new hedgerow, comprising a mix of native species will be replanted at the same location. |
| MM29 | Biodiversity: Otter | EIAR Chapter 6 / NIS | The following mitigation measures will be implemented to minimise water quality impacts on Otter:<br>• Water quality will be protected in all watercourses hydrologically connected to the proposed project following the mitigation measures detailed in sections 6.7.1.3.1 of Chapter 6 of the EIAR.<br>In order to prevent barrier effects to Otter commuting along the Glenshalane River the following mitigation measures will be implemented:<br>• Temporary fencing will be erected, allowing a 3m buffer from the riverbanks and the construction works area, creating an exclusion zone. The exclusion zone will protect the riverbanks and maintain safe passage of otter along the banks during the construction phase.<br>• All construction lighting will be directed away from the river to maintain a dark corridor. |
| MM30 | Biodiversity: Badger | EIAR Chapter 6 / NIS | The following mitigation measures will be implemented to minimise the impacts on Badger:<br>• Any temporary construction lighting used during the construction works will be cowled away from potential foraging/commuting sites to prevent disturbance to Badger within the area.<br>• To protect individual Badgers during the construction phase of the proposed project, all open excavations on site will be backfilled as soon as possible. Any deep excavations will have egress ramps in place, where feasible, to allow badger to safely exit the excavations. |
| MM31 | Biodiversity: Bats | EIAR Chapter 6 / NIS | Bats typically use woodland edge habitats for commuting and feeding purposes. Where turbines occur in close proximity to conifer plantation, the areas of conifer will be felled in order to discourage bat species from flying close to turbines.<br>The turbines blade tip height range from 179.5m to 185m, a rotor diameter range from 149m to 163m, a hub height range from 102.5m to 110.5m inclusive. Thus, all turbines within the proposed wind farm site will have a buffer between 97m to 100m. |
| MM32 | Biodiversity: Other mammal species | EIAR Chapter 6 / NIS | The following mitigation measures will be implemented to minimise the impacts on other mammal species:<br>• Any temporary construction lighting used during the construction works will be cowled away from potential foraging sites.<br>• To protect other mammal species during the construction phase of the proposed project, all open excavations on site will be backfilled as soon as possible. Any deep excavations will have egress ramps in place to allow mammals to safely exit the excavations. |
| MM33 | Biodiversity: Common Frog and Common Lizard | EIAR Chapter 6 / NIS | All open excavations on site will be backfilled as soon as possible. |
| MM34 | Biodiversity: Aquatic Species | EIAR Chapter 6 / NIS | All mitigation measures associated with sediment and pollution control outlined in Chapter 9 (Hydrology and Hydrogeology) of the EIAR, this CEMP, and within the surface water management plan (SWMP) will be implemented, which will ensure the protection of aquatic habitat located within or hydrologically connected to the proposed project. |

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| | (Atlantic salmon, Lamprey and Eel) | | Mitigation measures for all aquatic species identified as KER (Atlantic Salmon, Lamprey sp. and European Eel) will also follow the specific measures as set out in Section 6.8.1.3.1 of Chapter 6 of the EIAR. |
| **Ornithology** | | | |
| MM35 | Ornithology: General Mitigation | EIAR Chapter 7 | An Ecological Clerk of Works (ECoW) will be appointed by the contractor carrying out the construction of the wind farm and will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology / biodiversity. This will include toolbox talks, supervision of vegetation clearance, protection of nesting birds and minimising disturbance from site vehicles. See Section 6.9.2 of Chapter 6 of the EIAR for further details. |
| | | | A Bird Protection Plan will be implemented as part of the construction programme. This will incorporate all the measures discussed below that are designed to mitigate impacts to bird populations during the construction phase. |
| | | | A Hen Harrier Protection Plan will be implemented throughout the construction, operational and decommissioning phases of the wind farm. This will incorporate all the measures that discussed below that are designed to mitigate impacts to Hen Harriers. |
| MM36 | Hen Harrier: Habitat / land use of the Biodiversity Management Plan lands | EIAR Chapter 7 | The habitat / land use of the Biodiversity Management Plan lands are summarised in Table 7.21 of Chapter 7 of the EIAR. The section within the wind farm site and part of one section adjacent to the site were covered by the habitat survey for the proposed project. The land use of the remaining sections was assessed using CORINE data. Based on these data sources, around 25 ha of the lands are occupied by forestry and another 30 ha are occupied by improved grassland. The remaining area is mapped as heath or peat bogs. However, a lot of the area mapped as peat bogs in the CORINE dataset may be degraded bog / heath or acid grassland. |
| | | | The conifer plantations currently provide potential Hen Harrier foraging habitat for around a third of the forestry rotation. Successful implementation of the Biodiversity Management Plan will make the area currently occupied by these plantations permanently available as Hen Harrier foraging habitat and will improve the quality of the habitat (bog/heath generally provides higher quality foraging habitat than pre-thicket forestry). |
| | | | The areas mapped as heath or peat bogs are considered to be in degraded condition (based on assessments carried out by Future Energy Ireland). However, they may have some degree of suitability for foraging Hen Harriers. Successful implementation of the Biodiversity Management Plan will significantly increase the quality of these habitats and their potential contribution to the foraging resources available to the local Hen Harrier population. |
| | | | The areas mapped as pastures are likely to have negligible current value for Hen Harriers. Successful implementation of the Biodiversity Management Plan will create new foraging habitat for the local Hen Harrier population. |
| MM37 | Mitigation of disturbance impacts to Kingfisher and Grey Wagtail | EIAR Chapter 7 | Construction work on the grid connection route crossing of the Colligan River will only take place during the Kingfisher and Grey Wagtail breeding seasons if appropriate surveys have shown that there are no Kingfishers or Grey Wagtails breeding in the vicinity of the crossing. |
| MM38 | Ornithology: Other mitigation measures | EIAR Chapter 7 | Construction-phase mitigation measures to protect retained habitats within the proposed wind farm site, and to protect wetlands and watercourses, are described in Chapter 6 (Biodiversity) and Chapter 9 (Hydrology & Hydrogeology). |
| | | | Where possible, tree felling, and scrub clearance will not be carried out during the bird breeding season (1st March – 31st of August). |

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| **Land, Soils and Earthworks** | | | |
| MM39 | Land Use | EIAR Chapter 8 | Vegetation clearance will be kept to a minimum. |
| | | | The proposed construction work areas will be demarcated prior to the construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas. |
| | | | Construction vehicles will be restricted to designated areas and access tracks in order to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these areas. |
| | | | All disturbed ground outside of the permanent footprint will be fully reinstated following the completion of the works. |
| | | | Biodiversity enhancement measures will be undertaken to improve ecological habitats as detailed in Appendix 2-1 of the EIAR. |
| MM40 | Contaminated Sites/Potential for contamination - Materials and Fuel Management | EIAR Chapter 8 | Dedicated, bunded storage areas will be used for all fuels or hazardous substances. The earthworks will not be scheduled to be carried out during severe weather conditions. Good site practice will be applied to ensure that no fuels, oils, wastes or any other substances are stored in a manner on site in which they may spill and enter the ground. |
| | | | Fuel storage and fuelling facilities will be required at several fixed locations and at mobile locations around the proposed project, given the size of the it is impractical to track large plant to a single fixed facility. Fuel storage and any oil storage will be carried out in accordance with the Enterprise Ireland Best Practice Guide BPGCS005 Oil Storage Guidelines. |
| | | | Fuel and oil storage at fixed locations will be in a fixed tank, undercover and within a steel or concrete bund. |
| | | | A dedicated impermeable bunded refuelling area will be constructed adjacent to the fixed fuel storage areas. |
| | | | Double skinned plastic tanks will not be acceptable for any purpose unless they are placed within fixed concrete or steel bunds. |
| | | | Each fixed fuel and oil storage bunds will be sized to hold 110 % of the volume of the largest tank therein. The rainwater pumped from each bund will be discharged to the surface water drainage system via an oil interceptor. |
| | | | In the event of a spill, the liquid contained in the bund will be removed by a liquid waste tanker, as will the contents of the surface water drainage system and oil interceptor. Where refuelling is required on site away from fixed storage locations, this will only be carried out utilising intrinsically bunded mobile steel fuel bowsers. At site refuelling locations, refuelling will take place within mobile bunds, but at a minimum the fuel line from the bowser to the plant being fuelled will be contained by drip trays. |
| | | | Generators and associated fuel tanks to be used will either be placed within bunds as per fuel storage tanks or will be integrated units (i.e., fuel tank and generator in one unit) that are intrinsically bunded. No external tanks and associated fuel lines will be permitted on site unless these are housed within a fixed bund with the generator. |
| | | | The contractor's yard/maintenance yard will incorporate a bund for the storage of small items of plant and oil filled equipment, such as hand portable generators, pumps, etc. Storage of small volume oils or chemicals, in barrels, IBCs, etc, will be confined to a covered bunded area. Where barrels or other containers are required at work locations these will be stored in enclosed bunded cabinets, and drip trays will be used where distribution of the material is required. |
| | | | The main storage areas for oil filled equipment, vehicles, plant, etc, will be on an impermeable surface and the discharge of surface water from these areas will be via oil interceptors. An oil spill response plan will be developed for the construction works and appropriate containment equipment will be available at work locations in the event of a spillage. Oil spill response will form part the induction and training of site personnel. |

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| | | | All wastes generated on site will be segregated and appropriate materials are re-used on site. Residual materials will be collected by licensed waste hauliers for appropriate sorting, recycling and disposal. |
| MM41 | Contaminated Sites/Potential for contamination - Concrete/cement management | EIAR Chapter 8 | Contractors will be required to provide a designated bin for washing down the chutes of concrete lorries on site. |
| | | | Wash down and washout of concrete transporting vehicles will not take place on site. It is proposed to washout at the (offsite) source concrete batching site to prevent cementitious material and water entering the surface water network. |
| | | | Waste material will be removed from site to an appropriate waste permit facility. |
| | | | Disposal of excess concrete on any part of the construction site will be prohibited. |
| MM42 | Soil Compaction and Erosion | EIAR Chapter 8 | Landscaping areas will be sealed and levelled using the back of an excavator bucket to minimise the potential for erosion. The upper vegetative layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface. These measures will prevent the erosion of any peat in the short and long term. |
| | | | Peat, overburden, and rock will be reused on site to reinstate borrow pits and other excavations. Peat soils are limited and will be placed in the borrow pit deposition areas, completely below the existing ground profile on all sides thereby containing the peat/peaty soils and eliminating any possibility of a peat stability-related slope failure. The borrow pit deposition areas are located between T13 and T15 and provide an opportunity for landscaping and restoration to match the natural surroundings. |
| | | | On completion, the borrow pit deposition area surfaces will be stabilised by the establishment of natural vegetation. The detailed design, construction, and operation and maintenance of the borrow pit backfill operation will be documented in the design stage Peat Stability Risk Assessment, the Peat Stability Risk Register, and the Site Geotechnical Folder which is to be handed over for operation and maintenance. |
| | | | A key project goal is to incorporate sustainability into the design and construction of the project where practical. Where mineral soils are encountered in the excavation and construction of site roads, bases, etc, this material will be stockpiled for assessment and subsequent re-use. Where mineral soil is not directly suitable for construction it will be used for reinstatement works and will be geo-engineered as necessary. |
| | | | As part of the proposed works two borrow pits are proposed to provide materials suitable for construction, the purpose of which is to minimise the need to import of aggregates from elsewhere, reducing the project's environmental footprint. It is not intended that the borrow pits be fully reinstated, although it is proposed that the borrow pits will be partially reinstated using suitable excess materials. The remaining borrow pit areas, post reinstatement, will be established to enhance biodiversity. |
| | | | The construction traffic will utilise the permanent access track network for access and egress, and this access will be constructed in advance of other ground works in a sequential manner. |
| | | | A Spoil Management Plan (SMP) was developed as part of the planning application – See Appendix 2-3. This plan documents how spoil will be managed on site for re-use of materials, the design for on-site re-use and disposal options, and a scheme for the tracking and recording of soil movements. These measures will prevent the erosion of soil in the short and long term. Soils, overburden, and rock will be reused on site to reinstate any excavations where appropriate. |

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| | | | Access tracks will be constructed first to allow for access within the proposed project. Vehicular movements will be restricted to the footprint of the proposed project, particularly with respect to the newly constructed access tracks. This means that machinery must be kept to the tracks and aside from advancing excavations not move onto areas that are not permitted for the development, such as areas which have not been designated for access or infrastructure. |
| | | | Construction of internal electricity transmission cables will present similar, but lower-level risks, to the construction risks outlined above, and the same mitigation measures will be adopted as above. Surplus material from the onsite roads will be reused on site in the borrow pits or on road upgrades. |
| MM43 | Proposed GCR and works areas of the proposed TDR | EIAR Chapter 8 | The majority of the proposed GCR cabling will be laid in the public road. Construction method statements and templates will be implemented to ensure that the proposed GCR infrastructure is installed in accordance with the correct requirements, materials, and specifications of ESBN and EirGrid. The ducts will be installed and the trenches will be reinstated in accordance with ESBN/EirGrid, private third-party landowners and County Council specifications. Once all are satisfied, then the cables are pulled through the installed ducts in approximately 500 to 700 m sections. |
| | | | Excavated mineral material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2 m in height. Stockpiles will be located a minimum of 50 m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW). |
| | | | For concrete and asphalt/bitmac road sections, it is proposed to carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with the local authority. Surplus excavated bitmac material will be brought to a recycling facility for processing in accordance with the circular economy approach. |
| | | | For offroad i.e. access tracks/grass sections, the cable section will be laid within an existing access track. Silt fences will be utilised along the offroad sections. Short sections (<50m) will be excavated and reinstated on a phased basis with suitable excavated material to ground level and finish in a gravel track as per the EirGrid/ESBN specification. By limiting the excavated sections, the potential for compact or erosion is limited. |
| MM44 | Geohazard / Peat and Soil Stability | EIAR Chapter 8 | Peat or peaty soils on the proposed wind farm are shallow. Given the scale of the project, a major consideration for its development is the management of the materials excavated as part of the construction works. To this end and in order to further mitigate against any risk of peat instability, it is proposed to use any excavated peat to backfill the extant borrow pit areas. A Spoil and Peat Management Plan is provided in Appendix 2-3. A full material management plan for the various phases of the development will be designed and maintained over the course of the project. |
| | | | Mitigation measures include stepping or battering back of excavations to a safe angle to support the peat and soft clays during construction. To ensure slope stability, excavations will be battered back (sloped) to between 1:1.5 and 1:2 depending on the depth and type of material. Permanent slopes will generally be less than 1:3. The works programme for the construction stage of the proposed project will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. Works will be suspended if the forecast suggests any of the following is likely to occur: |

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| | | | • >10 mm/hr rainfall (i.e., high intensity local rainfall events);<br>• >25 mm rainfall in a 24-hour period (heavy frontal rainfall lasting most of the day); or<br>>Half the monthly average rainfall in any 7 days. |
| | | | Prior to works being suspended the following control measures will be completed:<br>• All open excavations to be secured;<br>• Temporary or emergency drainage to be provided to prevent back-up of surface runoff; and<br>Work during heavy rainfall and for up to 24 hours after heavy rainfall events to be suspended to ensure that drainage systems are not overloaded. |
| | | | The management of peat stability will be ongoing throughout the construction and operational stages of the project and will be managed through the use of a geotechnical risk register. |
| | | | A physical barrier will be implemented between the excavations and the potentially unstable material at unstable conditions, in the form of a granular berm or sheet piles. The long-term stability of the area around the wind turbine foundations will be achieved by filling the area back up to existing ground level following installation of the foundation. |
| | | | A suitably qualified and experienced geotechnical engineer or engineering geologist will monitor excavation works.<br>The earthworks will not be carried out during severe weather conditions. |
| **Hydrology and Hydrogeology (Water Quality Management)** | | | |
| MM45 | Surface Water Drainage | EIAR Chapter 9 | The design of the proposed project includes a range of best practice measures including the use of bunding and Sustainable Drainage Systems (SuDS), and the implementation of a CEMP and a surface water management plan (SWMP) (Appendix 2.8 and 2-10 of the EIAR). Approaches to manage surface water that take account of water quantity, water quality, biodiversity and amenity are collectively referred to as SuDS. The principal behind SuDS devices is to reduce the quantity of discharge from developments such as the proposed project to predevelopment flows and to improve the quality of run-off. The SuDS devices as part of the proposed project design mimic existing greenfield runoff in terms of volume, rate of runoff and quality of runoff. For the proposed project the quantity of run-off will be decreased to greenfield rates by providing SuDs methods such as surface water settlement ponds. |
| MM46 | Surface Water Quality | EIAR Chapter 9 | The SWMP will be implemented by the appointed contractor and will be regularly audited throughout the construction phase. The Environmental Manager will be required to stop works on site if he/she is of the opinion that a mitigation measure or corrective action is not being appropriately or effectively implemented. No instream works are proposed on the Glenshelane River crossing. The proposed bridge span is 19 m and there are no works with 3.5 m from the banks of the Glenshelane River. The proposed bridge flow capacity is >20 $m^3/s$ which is greater than the 1:100 year flow. Further details of the bridge crossing are provided on Drawing 10303-2024 of the EIAR. |
| | | | Near-stream construction work will only be carried out during the period permitted by the IFI (2016) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", that is, May to September inclusive. This time period coincides with the period of lowest expected rainfall and, therefore, minimum runoff rates. |

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| | | | This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. |
| | | | For the Glenshelane River crossing, any water in excavations will be pumped to lands that are >10 metres from any watercourse and discharged via a silt bag and overland flow to a discharge point. Silt fencing will be erected at the location of stream crossings. It is proposed to use triple silt fences (woven, high tensile strength heavy porous filter fabric) near the stream. The first silt fence will be installed by hand. Installing silt fencing requires proper placement based on the contours, fencing without long runs, heavy porous filter fabric i.e. Terrastop™, posts with proper depth and spacing, and tight soil compaction on both sides of the silt fence. |
| MM47 | Forestry: Felling | EIAR Chapter 9 | The Standards for Felling and Reforestation describe the universal standards that apply to all felling (thinning, clear felling) and reforestation projects on all sites. The standards will be implemented under a felling licence issued by the Department of Agriculture, Food & the Marine. |
| | | | In accordance with the Forestry and Water Quality Guidelines (Forestry Service, 2000), buffer zones will be identified and marked out on the ground. These guidelines deal with sensitive areas, erosion, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. Construction activities will be curtailed within the buffer zones in order to reduce erosion and sedimentation and, therefore, to protect surface water quality. Buffer zone widths vary from 10 m to 25 m, depending on slope and soil erosion classification. Details of buffer zones to be implemented during construction are included in Table 9-19 of the EIAR. |
| | | | The slopes across the proposed wind farm site are predominantly moderate (<1:7) with steeper slopes to the southeast and northeast. As the soil type varies across the proposed wind farm site, in line with the Forestry Service Guidelines (2000) a 10 m to 20 m buffer zone is appropriate. |
| | | | All associated tree felling will be undertaken using good working practices as outlined in the Forestry Report and the CEMP (Appendices 2-7 and 2-8 of this EIAR), the Forestry Harvesting and Environment Guidelines (Forestry Service, 2000) and the Forestry and Water Quality Guidelines (Forestry Service, 2000). Brash mats will be used to support harvesting and forwarding machinery. The brash mats reduce erosion of the surface and will be renewed as they become used and worn over time. |
| MM48 | Forestry: Silt fencing / sediment traps | EIAR Chapter 9 | During any near stream construction work, silt traps and triple row silt fences will be placed immediately down-gradient of the construction area for the duration of the construction phase. Silt fencing is presented on Drawing 10303-2040 to 10303-2042 of the EIAR. |
| | | | Typical sediment trap designs are illustrated in Section 9.5.1.1 of Chapter 9 of the EIAR and within the Forestry Schemes Manual, 2017. Sediment traps will require monitoring and maintenance throughout the construction stage. Sediment traps will be constructed and maintained in line with the requirements of the Forest Road Manual and Forest Drainage Engineering – A Design Manual (Forestry Schemes Manual, 2011). |
| MM49 | Forestry: Drainage | EIAR Chapter 9 | With reference to the COFORD 2002 guidance , the following measures will be implemented in relation to the existing forest drainage:<br>• Minimise the crossing of drains during felling and extraction and restrict machine activity to brashed extraction racks and forwarding routes; |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | • Where a drain crossing is needed, based on the size of the forest drain one of the following methods will be selected that prevents the breakdown and erosion of drain sides, namely:<br>  ○ For larger drains, deploy a heavy-duty plastic culvert lengthways into the channel and cover with brash material. The culvert must be of a diameter approximating the depth of the drain, to avoid any unnecessary undulation along the extraction route.<br>Where required, a solution for smaller drains is to temporarily lay log sections lengthways into the channel and overlay with brash. Again, logs will be that approximate to the depth of the channel to be crossed. |
| MM50 | Forestry Aquatic Zones and Larger Relevant Watercourses | EIAR Chapter 9 | Minimise the crossing of streams during felling and extraction by choosing alternative routes which avoid the watercourses/aquatic zones. |
| | | | Direct crossing over the stream bed will not be permitted. |
| | | | Water Features will be crossed at a right angle to the flow of water. |
| | | | Any necessary crossing will be via an appropriate structure that spans proud of the flow of water and prevents the breakdown and erosion of the banks. |
| MM51 | Concrete Management | EIAR Chapter 9 | Concrete is required for the construction of the turbine bases and foundations. Wash out of the main concrete mixing drum will not be permitted on site; wash out is restricted only to chute wash out. Wash down and washout of the concrete transporting vehicles will take place at an appropriate facility off-site.<br>Cement and raw concrete will not be spilled into watercourses. Ready-mixed supply of wet concrete products and emplacement of pre-cast elements such as culverts and the clear span bridge across the Glenshelane River will take place. During the delivery of concrete on site, only the chute will be cleaned on-site.<br>Chute cleaning will be undertaken at lined cement washout lagoons. The collected concrete washout water and solids will be emptied on a regular basis. Washout will be undertaken at the construction compounds. These lagoons will be cleaned out by a licensed waste contractor. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Weather forecasting will be used to plan dry days for pouring concrete. The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event. |
| MM52 | Fuels & Chemicals | EIAR Chapter 9 | With regards to on-site storage and handling of potentially pollutant materials:<br>• All on-site refuelling will be carried out by a trained competent operative.<br>• Mobile measures such as drip trays and fuel absorbent mats will be kept with all plant and bowsers and will be used as required during all refuelling operations;<br>• A spill kit will be stored with the bowser and the person operating the bowser will be trained in its use;<br>• All equipment and machinery will have regular checking for leakages and quality of performance and will carry spill kits;<br>• Any servicing of vehicles will be confined to designated and suitably protected areas such as construction compounds; and<br>• Additional drip trays and spill kits will be kept available on site, to ensure that any spills from vehicles are contained and removed off site. |

| Ref No. | Related to | Location | Mitigation Measure |
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| MM53 | Drainage Management | EIAR Chapter 9 | Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. |
| | | | Track edge drainage/swales will be implemented to control run-off from the running surface to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points. Swales along access tracks will be installed in advance of the main construction phase. |
| | | | Swales will provide additional storage of storm water, located along gradient. Given the steep longitudinal gradients on some sections of access track, regular check dams will be employed within the trackside swale on these sections to reduce the flow velocity and provide settlement opportunity.<br>Swales will re-vegetated following excavation. Vegetation will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention. |
| | | | Settlement ponds will be located downstream of road swale sections and at hardstand locations, to manage/buffer volumes of runoff discharging from the drainage system during periods of high rainfall, thereby reducing the hydraulic loading to watercourses. Settlement ponds are designed in consideration of the greenfield runoff rates.<br>The settlement pond design (Drawing 11303-2036 of the EIAR) is based on primary settling out of suspended solids from aqueous suspension. Settlement ponds will be installed alongside with the formation of the road and will be fenced off for safety.<br>Only the proposed onsite access track will be used for project-related traffic. |
| MM54 | Borrow Pit reinstatement areas | EIAR Chapter 9 | Excavated material will be reused on site. The stockpiling of materials will be carefully supervised as per the mitigation measures listed in Chapter 8 of the EIAR (Land, Soils and Geology). Surplus material and peaty soil/peat will be placed in the borrow areas. |
| | | | The nature of the spoil deposition areas is an important measure in mitigating against suspended solids in run-off. The spoil deposition areas have the following characteristics; >50 m from rivers, no in situ peat, relatively flat (<3 degrees), and topographically constrained. This mitigates against potential stability issues. The drainage scheme for the spoil deposition area will be controlled through a series of proposed settlement ponds with the provision of an overflow. |
| | | | Settlement ponds will be maintained over the course of the development and for a period until vegetation has stabilised. |
| | | | The reinstated borrow pit will be allowed to naturalise and utilise the vegetative features to filter water on site. Revegetation of the spoil deposition areas will stabilise the surfaces. Based on the existing plant species, the vegetation will initially comprise predominantly rushes, grasses, sedges and bryophytes. These areas will reseed naturally utilising adjacent and local seed banks. |
| MM55 | Stream crossings / Proposed GCR and works areas on the proposed TDR | EIAR Chapter 9 | Where stream crossings occur, it is proposed to use clear span bridges (i.e. Glenshelane River). For the Glenshelane River crossing, three lines of silt fence will be erected to provide a physical separation, which will trap suspended sediment from the works area (see Drawings 11303-2024, 11303-2040 to 11303-2042 of the EIAR). Silt fences will be inspected routinely and inspections will be increased after runoff events. A bottomless culvert/clear span bridge will be utilised on the smaller Boherawillin and Moneygorm east streams. Commercial forestry drains will be crossed using standard culverts. |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | Silt fencing will be erected at the location of stream crossings along the proposed GCR. Appropriate steps will be taken to prevent soil/dirt generated during the temporary upgrade works to the proposed TDR from being transported on the public road. Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil/dirt from the location of the proposed TDR works when required. This will reduce the potential for sedimentation of surface watercourses locally. |
| | | | Appropriate steps will be taken to prevent soil/dirt generated during the temporary upgrade works to the proposed TDR from being transported on the public road. Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil/dirt from the location of the proposed TDR works areas when required. This will reduce the potential for sedimentation of surface watercourses locally. |
| | | | Further mitigation measures in relation to the proposed GCR route and road/junction accommodation works on the proposed TDR are outlined in the CEMP in Appendix 2.8 of the EIAR. |
| MM56 | Groundwater Quality | EIAR Chapter 9 | During the construction phase, all works associated with the construction of the wind farm site will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Groundwater pumped from excavations will be treated to remove silt by the use of silt bags. Water will discharge from the silt bags into settlement ponds and the SuDS network. |
| | | | Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016). Groundwater from the borrow pits will be treated in the settlement ponds, see Drawing 11303-2040 to 11303-2043 of the EIAR. An alternative supply to the onsite well will be provided in the event of a derogation of the water supply. A CEMP was developed for the proposed project to ensure adequate protection of the water environment. All personnel working on the proposed project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP. |
| **Material Assets** | | | |
| MM57 | Telecommunications | EIAR Chapter 11 | In the unlikely event that a communication underground cable or link is damaged or interfered with during construction, the operator will be contacted to agree a repair which will be carried out as soon as possible at the developers cost. In addition, the developer will sign an agreement with 2RN prior to construction to commit to restoring service to any end users that may have their service disrupted as a result of the proposed project. This is standard industry practice and will eliminate any potential effects in this regard. |
| MM58 | Waste Management (including wastewater) | EIAR Chapter 11 | Segregation of waste will be carried out to maximise the potential for waste recycling and minimise potential effect on waste services. Suitably permitted commercial waste collectors will be employed to remove any waste arisings generated from construction to the nearest appropriately licensed waste management facilities within County Waterford. |
| | | | Wastewater from the staff welfare facilities will be managed by means of a sealed storage tank, with all wastewater being tankered off-site occasionally (as required) by a permitted waste collector to a wastewater treatment plant. The permitted waste collector will also be responsible for ensuring clean water storage tanks are topped up. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. It is proposed to use low volume |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | flush toilets (such as those in commonly used port-a loos) and low volume sink faucets to significantly reduce the volume of waste water produced. In addition, the number of staff is likely to fluctuate rather than being constantly at 100 people per day, thereby reducing the volume of wastewater produced. |
| **Noise & Vibration** | | | |
| MM59 | Noise and Vibration | EIAR Chapter 12 | The Contractor undertaking the construction works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration. To ameliorate any potential noise impacts that may present during the construction phase, a schedule of noise and vibration control measures has been formulated in accordance with best practice guidance. These are outlined in the CEMP that has been prepared for the proposed project. |
| MM60 | Proposed GCR Construction Works | EIAR Chapter 12 | In respect of the GCR construction, a temporary solid hoarding may be employed where there are NSL's within 25 m to the activity. This can be expected to reduce noise at the NSL by 5 - 10 dB. With this mitigation measure in place, noise levels at 20 m distance from construction activity are expected to be within the criterion for linear construction works in Section 12.2.2.1.1 of Chapter 12 of the EIAR. |
| | | | Additional or alternative mitigation measures include:<br>• Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;<br>• Selection of plant with low inherent potential for generation of noise and/ or vibration, and;<br>Placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints. |
| | | | It is noted that the assessment presented in Section 12.5.2.5 of Chapter 12 of the EIAR is conservative, and the assessment has identified a potential exceedance of the noise criteria at two number NSL's with 25 m of the works. If the appointed contractor can demonstrate through onsite monitoring or other means that mitigation measures are not required to meet the relevant construction noise criteria, then works can proceed without specific mitigation measures in place. |
| MM61 | Blasting | EIAR Chapter 12 | If blasting is undertaken as part of the proposed project, a detailed assessment will be undertaken by a specialist blast design engineer to determine the blast design parameters; all mitigation measures specified by the blast design engineer to keep vibration values within the criteria in Section 12.2.2.2 of Chapter 12 of the EIAR will be implemented. |
| | | | Air overpressure from a blast is difficult to control, however, because of its variability much can be done to reduce the effect. A reduction in the amount of primer cord used, together with the adequate burial of any that is above the ground, can give dramatic reduction to air overpressure intensities especially in the audible frequency range. Should complaints arise, they are likely to be received from an area downwind of the blast site, and therefore, blasting will be postponed during unfavourable weather conditions. Furthermore, as air blast intensity is a function of total charge weight, then a reduction in the total amount of explosives used can also reduce the air overpressure value. |
| | | | Further guidance will be obtained from the recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 in relation to blasting operations. |
| | | | The methods used to minimise complaints could consist of some or all of the following: |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | • Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00 hrs).<br>• Notification to nearby residents before blasting starts (e.g. 24-hour written notification).<br>• The firing of blasts at similar times to reduce the 'startle' effect.<br>• On-going circulars informing people of the progress of the works.<br>• The implementation of an onsite documented complaints procedure.<br>• The use of independent monitoring by external bodies for verification of results.<br>Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence. |
| **Air Quality / Dust** | | | |
| MM62 | Dust Management Plan | EIAR Chapter 14 | In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of an outline Dust Management Plan (Appendix 14.1 of the EIAR). The Dust Management Plan will be reviewed prior to the construction and decommissioning phase of the proposed project, it includes the following:<br>• On-site access tracks and public roads in the vicinity of the site shall be regularly cleaned to remove mud, aggregates and debris and maintained when the daily inspections deem any trackout to public roads has occurred. All road sweepers shall be water assisted;<br>• Any road that has the potential to give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions; Public roads within 250 m of the site entrance/exit shall be regularly inspected for cleanliness and cleaned as necessary due to trackout from the proposed project;<br>• In the event of dust nuisance occurring outside the site boundary, movement of materials will be immediately terminated, and satisfactory procedures implemented to rectify the problem before the resumption of operations;<br>• During movement of materials both on and off-site, trucks carrying materials which have the potential to generate dust will be covered at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions;<br>• Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods (as determined by the site environmental manager on site); and<br>• The Dust Management Plan will be reviewed by the appointed contractor and client at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.<br>At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. |
| MM63 | Climate Mitigation | EIAR Chapter 14 | The IEMA GHG Management Hierarchy (IEMA 2020b) will be followed for impact minimisation. The Hierarchy is as follows:<br>First eliminate:<br>• Influence business decisions/use to prevent GHG emissions across the lifecycle; |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | • Potential exists when organisations change, expand, rationalise or move business;<br>• Transition to new business model, alternative operation or new product/service.<br>Then reduce:<br>• Real and relative (per unit) reductions in carbon and energy;<br>• Efficiency in operations, processes, fleet and energy management;<br>• Optimise approaches (e.g. technology) and digital as enablers.<br>If you can't eliminate or reduce, then Substitute<br>• Adopt renewables/low-carbon technologies (on site, transport etc.);<br>• Reduce carbon (GHG) intensity of energy use and of energy purchased;<br>• Purchase inputs and services with lower embodied/embedded emissions.<br>The final option is to compensate:<br>• Compensate 'unavoidable' residual emissions (removals, offsets etc.);<br>• Investigate land management, value chain, asset sharing, carbon credits;<br>Support climate action and developing markets (beyond carbon neutral). |
| MM64 | Embodied carbon | EIAR Chapter 14 | Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Measures to reduce the embodied carbon of the construction works will be implemented as follows:<br>• A construction programme will be created to allow for sufficient time to determine reuse and recycling opportunities;<br>• Alignment with requirements under the Local and National Climate Action Plan;<br>• The replacement, where feasible, of concrete containing Portland cement with a low carbon concrete as per the Climate Action Plan;<br>• The IEMA mitigation hierarchy will be followed (see above);<br>• A suitably competent contractor will be appointed who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;<br>• Materials will be reused on site within the new build areas where possible;<br>• Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;<br>• All plant and machinery will be well maintained and inspected regularly;<br>• Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site; and<br>Sourcing materials locally where possible to reduce transport related CO2 emissions. |
| MM65 | Future climate change | EIAR Chapter 14 | Measures (see Section 14.4.3.3 of Chapter 14 of the EIAR) have been incorporated into the design of the proposed project in order to mitigate against the impacts of future climate change. These measures have been considered when assessing the vulnerability of the proposed project to climate change but will be reviewed on a regular basis (every 5 years) to ensure they continue to be appropriate to mitigate the effects of climate change (see Section 14.4.3.3 of chapter 14 of the EIAR). |
| **Archaeology and Cultural Heritage** | | | |

| Ref No. | Related to | Location | Mitigation Measure |
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| MM66 | Topsoil / Excavations | EIAR Chapter 15 | All stripping of topsoil across the proposed project, including excavations as part of the proposed GCR within 40m of AH1 (ringfort) and AH2 and AH3 (church and graveyard), as part of watercourse crossings and road widening along the proposed TDR will be monitored by a suitably qualified archaeologist. Should any features of archaeological potential be discovered during the course of the works the DoHLGH will be informed immediately and archaeological excavation (preservation by record) or in-situ will be required. Preservation by record or in-situ will require approval from the DoHLGH, with all archaeological excavation carried out under licence from the National Monuments Service of the DoHLGH. |
| **Traffic Management** | | | |
| MM67 | Construction Traffic | EIAR Chapter 16 | To mitigate the effect of the construction traffic, the proposed project will utilise all available resources within the existing site to reduce the requirement for importation of materials to site. Excavation of stone material from the borrow pits within the proposed wind farm site to provide construction material will reduce the HGV volumes required. |
| | | | The greatest traffic volume effect is associated with the haulage of the materials for the site compounds, site roads and turbine hardstands from July to September 2027. Key deliveries during this period are aggregate and stone which may be sourced from the borrow pits onsite. The internal access tracks have been designed to utilise existing forestry access tracks where feasible, reducing the volume of materials required for importation to the site. |
| | | | The second greatest volume of traffic effect is associated with the concrete pours for the turbine foundations. The works at other areas within the proposed wind farm site will continue during these concrete pours, but only essential deliveries will be scheduled to occur on the same day as the concrete pours, and local authorities and the community will be informed in advance of the foundation pours. |
| MM68 | Traffic Management Plan (TMP) | EIAR Chapter 16 | The Traffic Management Plan (TMP) is a comprehensive set of mitigation measures that will be implemented by the Contractor before and during the construction phase of the proposed project to minimise its effects. The purpose of the TMP is to capture the mitigation measures in this EIAR as discussed with Waterford County Council and Kilkenny County Council during scoping and any future traffic mitigation as they may arise during the proposed project. The TMP proposed for the proposed project is included in Appendix 2-4 of the EIAR. The following mitigation has been incorporated into the TMP: |
| | | | Traffic movements will be limited to 07:00 - 19:00 Monday to Friday and 07:00 – 14:00 Saturday, unless otherwise agreed in writing with Waterford County Council. |
| | | | HGV movements will be restricted during peak road network hours (including school hours) from 08:30 – 09:30 and 16:30 – 17:30 Monday to Friday, unless otherwise agreed in writing with Waterford County Council. |
| | | | HGV movements for the proposed project shall be directed away from sensitive areas (i.e., schools, urban centres). |
| | | | No parking shall be permitted along the access route for unloading or activities that result in blockages of access routes. Such vehicles will be immediately requested to move to avoid impeding the works and traffic on the road network. |
| | | | Measures to remove queuing of construction traffic on the adjoining road network, including turning space and queuing of convoy HGVs will be provided within the sites. |
| | | | Wheel wash equipment will be used on site to prevent mud and stones from being transferred from the site to the public road network. |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | Activities generating dust will be minimised where practical during windy conditions. Loads will be covered on arrival and departure from the site, where required. |
| | | | Clear construction warning signs will be placed on the public road network to provide advance warning to road users of the presence of the construction site and slower-moving vehicles making turning manoeuvres. |
| | | | Access to the construction site will be controlled by onsite personnel and all visitors will be asked to sign in and out of the site by security/site personnel, and site visitors will all receive a suitable Health and Safety site induction. |
| | | | Security gates will be sufficiently set back from the public road, so that vehicles entering the site will stop well clear of the public road. |
| MM69 | TMP: Construction Practice | EIAR Chapter 16 | Traffic Management Co-ordinator – a competent traffic management co-ordinator will be appointed for the duration of the proposed project and this person will be the main point of contact for all matters relating to traffic management. |
| | | | Delivery Programme – a programme of deliveries will be submitted to Waterford County Council in advance of the delivery of the turbine components to the site. |
| | | | Information to locals – residents in the area will be informed of any upcoming traffic related matters, e.g., temporary lane/road closures or any night deliveries of turbine components, via posters in public places. Information will include the contact details of the Applicant's representative, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. |
| | | | Pre and Post Construction Condition Survey – a pre-condition survey of roads on approach to the site will be carried out prior to construction commencement to record the condition of the road. A post construction survey will be carried out after the works are completed. The timing of these surveys will be agreed with Waterford County Council. |
| | | | Liaison with Local Authorities – liaison with Waterford County Council and Kilkenny County Council, including the roads and transport section, through which the delivery route traverses, and An Garda Siochána, during the delivery phase of the AILs, wherein an escort for all convoys may be required. |
| | | | Temporary Alterations – implementation of temporary alterations to road network at critical junctions. |
| | | | Travel plan for construction workers – a travel plan for construction staff and sub-contractor construction staff. |
| | | | Temporary traffic signs – As part of the traffic management measures, temporary traffic signs will be put in place. |
| | | | TMOs will be present at site access point during peak delivery times under supervision of Co-Ordinator. |
| | | | Delivery Times of Large Turbine Components – TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. |
| MM70 | Traffic Effect | EIAR Chapter 16 | To mitigate the effect of the construction traffic, the Traffic Management Plan in Appendix 2-4 will be implemented in full by the appointed Contractor. During the construction phase, all available resources within the existing site will be utilised to reduce the requirement for the importation of materials to the site. Excavation of stone material from two borrow pits within the proposed wind farm site to provide capping material will reduce the HGV volumes required. |
| | | | In addition to the borrow pits, the internal access tracks have been designed to utilise existing forestry access tracks where feasible, reducing the volume of materials required for importation to the site. |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | The largest traffic volume is associated with the concrete pours for the turbine foundations. The works at other areas within the proposed wind farm site will continue during these concrete pours, but only essential deliveries will be scheduled to occur on the same days as the concrete pours. To mitigate this effect, liaison with local authorities and the community in advance of the foundation pours will occur. |
| MM71 | Junction Visibility | EIAR Chapter 16 | Adequate visibility is available from the site access onto the Local Road L5055, of 4.5 m 'x- distance' and 'y-distance' of 160 m and, in three points where internal route cross local roads (i.e., local roads L5054, L5055 and L1026). On these three crossing points, adequate visibility is available of 4.5 m 'x- distance' setback from road and 'y-distance' of 55 m. Visibility sightlines are in accordance with Waterford City and County Development Plan and TII DN-GEO-03060 (May 2023). |
| | | | Maintenance of the hedgerows within the visibility splays will be undertaken to maintain the required visibility splays and mitigate the potential for overgrown vegetation which may result in inadequate visibility at the access and crossing points during the construction activities, see Drawings No. 11303-2020 to 11303-2023. |
| | | | Adequate visibility at the site accesses will mitigate the potential increased likelihood for collisions between construction generated traffic and existing road network traffic. |
| MM72 | Junction Swept Past Analysis | EIAR Chapter 16 | In accordance with the TII DN-GEO-03060 (May 2023) swept path analysis has been undertaken at the site access for a worst-case construction vehicle (i.e., articulated truck with 16.5m long), in addition to those undertaken for the AIL as outlined in Table 16-8 of Chapter 16 of the EIAR. The swept path of the maximum legal articulated vehicle accessing/departing the site are available in Drawing No. 11303-2020. |
| | | | The swept path analysis of the longest AIL, the turbine blade, were undertaken following identification of potential pinch points in the route assessment report as presented in drawings in Appendix 2-2 of the EIAR. The swept path analysis used an 81.5 m blade length which is the maximum blade length to be used in the proposed project, thus the worse-case scenario for this analysis. |
| | | | The proposed site access design has been developed to take cognisance of the swept path of all vehicles arriving to and departing from the site. The gate has been positioned to allow for a large vehicle to wait clear of passing traffic on the L5055, to avoid potential collision between a passing vehicle and one stopped to open the gates at the site access. |
| | | | At the approach to the site access, the internal access tracks are proposed at a widened width of 7.0 m, to accommodate safe clearance width between two large construction vehicles passing. |
| MM73 | Haul Routes | EIAR Chapter 16 | Mitigation measures on the proposed haul roads:<br>• Selection of a viable route with the lowest impact on the road network.<br>• Avoidance where possible of sensitive receptors and urban settings:<br>  ○ The site access route encourages the use of the existing infrastructure in the area while avoiding the local road and potential sensitive receptors.<br>  ○ Proposed TDR along national roads with largest capacity to accommodate the vehicles.<br>  ○ The typical construction materials (i.e., gravel, aggregates, concrete, etc.) are obtained from borrow pits onsite and from local quarries in the proximity of site.<br>  ○ Restricting HGV movements during peak sensitive times on the road networks (i.e., at school times) |

| Ref No. | Related to | Location | Mitigation Measure |
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| | | | To mitigate the effect of the AIL delivery on the road network, the advanced works will be undertaken (i.e., hardstanding, making signs demountable, utility diversions etc). The hardstanding works areas will be temporary in nature and removed once the final turbine is delivered to site. |
| | | | To mitigate potential effects of the AIL deliveries, these deliveries will be undertaken under Garda and traffic management escort during off-peak (i.e., night-time) hours. The arrangement of the appropriate abnormal load licences will be obtained by the appointed contractor in a timely fashion on procurement of the AIL. The appointed contractor will liaise with the relevant road's authorities and, An Garda Síochána on the delivery schedule for the AILs. |
| MM74 | Post-Construction Pavement Surveys | EIAR Chapter 16 | The client will undertake post-construction visual pavement surveys on the construction material haul routes and proposed TDR. Where the surveys conclude that damage on the roadway is attributable to the Construction Phase of the proposed project, the Applicant will fund the appropriate reinstatement works to bring the road back to pre-construction condition, details for which will be agreed with the Roads Authorities. |
| MM75 | Project Delays | EIAR Chapter 16 | All required road opening licences, agreements with the Local Authorities, and An Garda Síochána to facilitate the movement of AILs will be sought by the appointed Contractor in a timely manner to avoid delays to the proposed project. |
| | | | A delay to the project construction programme will have a negative effect by increasing the duration of construction vehicles on the road network and potentially extending traffic management timeframes. |
| MM76 | Grid Connection Route | EIAR Chapter 16 | The proposed GCR is from the proposed wind farm site to the existing substation near Dungarvan. To mitigate the effect on the road network, at the time of the construction work and in advance of the required Road Closure, the appointed Contractor will consult and comply with the Roads Authority, An Garda Síochána and other Emergency services to agree a suitable diversion route prior to implementing a Road Closure. |
| | | | To mitigate the effect of the cable laid within the public road, the reinstatement works will be backfilled and reinstated as soon as practicable. The reinstatement works will be undertaken in accordance with the Guidelines for Managing Openings in Public Roads from the Department of Transport, Tourism and Sport (2017), also known as the "Purple Book". The proposed reinstatement and construction details and phasing will be agreed with associated Local Authorities in advance of the works. The Contractor will be responsible for arranging for the required road opening licences. |

# 8.0 MONITORING PROPOSALS

All monitoring proposals relating to the pre-construction and construction phases of the proposed project were set out in various sections of the EIAR, and NIS prepared as part of the planning application.

This section of the CEMP groups together all of the monitoring proposals presented in the EIAR and NIS. The monitoring proposals are presented in tabular format on the following pages. By presenting the monitoring proposals in this format, it is intended to provide an easy to audit list that can be checked and reported on during the course of the proposed project. This table will be further developed upon and used as a reporting template for site compliance audits across project phases.

*Table 8.1: Table of Monitoring Proposals*

| Ref No. | Related to | Location | Monitoring Measure |
|---|---|---|---|
| | | | |
| **Pre-construction Phase** | | | |
| MP1 | Pre-construction Biodiversity Surveys | EIAR Chapter 6 | The pre-construction surveys [Otter, Badger, Common Frog, Common Lizard] will be carried out in suitable habitat, in advance of the construction works by the appointed ECoW. |
| MP2 | Ornithology | EIAR Chapter 7 | The pre-construction breeding bird surveys will be carried out in the breeding season preceding the start of construction, and in every subsequent breeding season across the duration of the construction period. |
| **Construction Phase** | | | |
| MP3 | Roles and Responsibilities (Construction Phase) | EIAR Chapter 6 | The applicant will appoint an Owners Engineer (OE) to act on their behalf during the construction phase of the project. The OE will have access to and / or employ various specialist advisors such as an archaeologist, ecologist, hydrologist and geotechnical engineer. The role of these specialist advisors will be defined in detail in the OE specifications but in summary it is expected that they will review and approve method statements and other documents relating to their specialisms.<br>The applicant will appoint a contractor to construct the proposed project, and the contractor will be required to provide a suite of specialists, including the ECoW, as part of their delivery team.<br>The applicant, OE and Contractor's team will form the 'Project Team' for the construction phase of the development of the proposed project. |
| MP4 | Ecological Clerk of Works | EIAR Chapter 6 | The role of the ECoW is defined by British Standard BS 42020:20131 as 'person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to "development" site personnel on necessary working practices required to i) safeguard ecological receptors on site and ii) aid compliance with any consents and relevant wildlife legislation related to the works'. The requirements of the ECoW role is typically largely fulfilled by a single individual with support and assistance provided by technical specialists and senior colleagues when required. The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role |

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| | | | and in addition, where needed, can access support from senior ecologists within the company with the required qualifications, training and experience.<br>The ECoW will have the power to 'Stop Works' at any time they deem it necessary to do so.<br>The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology / biodiversity as set out in the project EIAR, CEMP etc. The ECoW will be responsible for the day-to-day management and interaction with the project Environmental Manager. The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation.<br>The role of the ECoW includes tasks such as, but not limited to, the following:<br>• Nest checks during bird breeding season,<br>• Relocation of amphibians,<br>• Supervision of works as required to ensure compliance with environmental legislation and the requirement of the schedule of works and EIAR.<br>• Preparation of Method Statements for ecological tasks such as those described above.<br>• Input to, and review of, construction method statements to ensure adequate protection of biodiversity is addressed during works.<br>• Updating the Biodiversity Management Plan during the lifetime of the project.<br>The ECoW will also be required to document activities using photographs and log information to registers / logs. The Environmental Manager and ECoW will work as a team and are expected to be in contact daily with the ECoW relaying any identified concerns or issues on site to the Environmental Manager. |
| MP5 | Excavation Works | EIAR Chapter 8 | A suitably qualified and experienced geotechnical engineer or engineering geologist will monitor excavation works. The earthworks will not be carried out during severe weather conditions. |
| MP6 | Surface Water Quality | EIAR Chapter 9 | It is recommended that local surface water features at the proposed wind farm site boundary are monitored pre-construction and during construction to take account of any variations in the quality of the local surface water environment as a result of activities related to the proposed wind farm site. A surface water management plan (SWMP) is included in Appendix 2-10.<br>The main water parameters in terms of their potential to cause damage to aquatic life, ecosystems, human health, and water quality in the receiving waters are outlined in the proposed surface water monitoring schedule. Inspections of silt traps are critical after prolonged or intense rainfall while maintenance will ensure maximum effectiveness of the proposed measures. Stockpiles will be evaluated and monitored and kept stable for safety and to minimise erosion.<br>Turbidity monitors/alarms will be strategically placed upgradient on the Glenshelane River and downgradient of the works to assess the effects, if any, of the main construction works including bridge crossings and turbine base construction. Elevated turbidity could result from a number of on-site construction activities or from off-site sources i.e. erosion, forestry or agricultural activities. Where elevated turbidity is noted both upstream and downstream, visual checks will be undertaken. All monitoring equipment will be calibrated regularly to ensure that results are accurately measured.<br>Corrective Actions would include: |

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| | | | • Investigate whether channels used to convey water are protected with vegetation, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures.<br>• Check all outlets and locations of turbidity monitors<br>• Stop dewatering if the downgradient area shows elevated turbidity or erosion. .<br>• Check outlet protection or a velocity dissipation device.<br>• Ensure a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlay) in place at outlets.<br>• Check for leaking pumps, hoses, and pipe connections and fix same if identified.<br>A programme of inspection and maintenance will be designed, and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed, and records kept.<br>During the construction phase, field testing, sampling and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event-based as appropriate). |
| MP7 | Ground Water Quality | EIAR Chapter 9 | The dewatering operations will be inspected once each day when dewatering is taking place to ensure that dewatering treatment controls are working correctly and to evaluate whether there are observable indicators of sediment discharges. Where any issues are encountered, action will be undertaken to correct any problems at the proposed project or with the dewatering controls that may have contributed to the discharges.<br>Regular monitoring of groundwater (levels and quality) will take place using existing monitoring boreholes during the construction phase. The existing groundwater well on site will be monitored on site during construction and for a period following cessation of construction activities (to be agreed with the relevant authorities). |
| MP8 | Archaeological Monitoring | EIAR Chapter 15 | A suitably qualified archaeologist will be appointed to monitor all stripping of topsoil across the proposed project, including excavations as part of the proposed GCR within 40m of AH1 (ringfort) and AH2 and AH3 (church and graveyard), as part of watercourse crossings and road widening along the proposed TDR. |

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