Appendix 7

Construction Environmental management Plan (CEMP)

FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED DERRYNADARRAGH WIND FARM, CO. KILDARE, OFFALY & LAOIS

Volume III – Appendices

Appendix 2.1 - Construction and Environmental Management Plan (CEMP)

Prepared for:

Dara Energy Ltd.

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1. INTRODUCTION

1.1 General Introduction and Purpose

This document is the Construction and Environmental Management Plan (CEMP) for the Proposed Development and has been prepared by Fehily Timoney and Company (FT) on behalf of Dara Energy Ltd.

The CEMP will be a key construction contract document, and the appointed contractor will be obliged to implement it in full. It will be updated by the Contractor prior to construction to take account of any relevant conditions attached to the planning permission and will be implemented for the duration of the construction phase of the Proposed Development. The CEMP also includes measures for the operational and decommissioning phase of the Proposed Development. Decommissioning of the Proposed Development is intended to take place following its 35-year operational life. General guidance for the decommissioning of the Proposed Development is contained in Section 4.3.1 of this CEMP.

The CEMP will be a live document and will be subject to ongoing review through regular environmental auditing and site inspections. The measures in the CEMP will be implemented in full and further measures may be added as may be identified from the auditing and site inspections.

This CEMP sets out the key construction and environmental management issues associated with the construction of the Proposed Development, to ensure that the environment is protected and impacts on the environment are minimised.

The CEMP should be read in conjunction with the EIAR and NIS. In the case of any ambiguity or contradiction between this CEMP and the EIAR, the EIAR shall take precedence.

The document is divided into six sections:

Section 1: *Introduction* provides an overview of the existing site and the Proposed Development.

Section 2: *Existing Site Environmental Conditions* provides details of the main existing geotechnical, hydrological, ecological and archaeological conditions onsite. These conditions will be considered by the contractor in the construction, operation and decommissioning of this Proposed Development.

Section 3: *Overview of Construction Works,* this section provides an overview of the construction works proposed, including drainage and sediment controls to be installed.

Section 4: *Environmental Management Plan (EMP*), this section outlines the main requirements of the EMP and outlines operational controls for the protection of the environment including soil management, habitat and species, site drainage control, archaeology, construction traffic, site reinstatement and decommissioning, waste management.

Section 5: *Safety & Health Management Plan*, this section defines the work practices, procedures and management responsibilities relating to the management of safety and health during the design, construction and operation of the Proposed Development.

Section 6: *Emergency Response Plan* contains predetermined requirements and procedures to ensure the safety, health and welfare of everybody involved in the project and to protect the environment during the construction phase of the Proposed Development.

1.2 Statement of Authority

This CEMP was completed by Fehily Timoney and Company. The CEMP was drafted by Aoife Hurd and checked by Jim Hughes.

Aoife Hurd is a Senior Civil Engineer at Fehily Timoney and Company working in the Energy and Planning Department. She holds a First-Class Honours Bachelor's Degree and Master's Degree in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland (EI) and has experience working on residential, infrastructure and renewable energy projects at all stages from concept to construction. Aoife provides technical and engineering support to the EIAR teams for a variety of commercial scale renewable energy projects.

Aoife has experience in the preparation of Traffic and Transportation assessments, Air and Climate assessments, as well as other technical chapters associated with EIARs and environmental reports for renewable energy projects ranging from wind farms, solar farms, grid connections, battery energy storage systems and ancillary grid infrastructure projects. She also has experience in the design of renewable energy developments.

Jim Hughes holds a BA in Public Administration from the University of Limerick, an MSc in Town Planning from Queen's University Belfast and a HDip in Environmental Impact Assessment from University College Dublin. Jim has led and managed large infrastructure projects in Ireland in the planning, environmental assessment and permitting disciplines including many wind farm developments.

1.3 The Proposed Development

The key components of the Proposed Development include: The wind farm site, the grid connection, and the turbine delivery route.

A detailed description of the Proposed Development is contained in Chapter 2 of the EIAR. A detailed description of the proposed construction works is outlined in Section 3 of this CEMP.

An overview of the Proposed Development is shown in planning drawings submitted with the application and in EIA Figures included in Volume IV of the EIAR documentation.

1.3.1 The Site

A 10-year planning permission and 35-year operational life from the date of commissioning of the Proposed Wind Farm is being sought.

The proposed development involves the construction of 9 no. wind turbines – 4 no. turbines will have a tip height of 186m above existing ground level with a hub height of 105m and rotor diameter of 162m, and 5 no. turbines will have a tip height of 187m above existing ground level with a hub heigh of 106m and rotor diameter of 162m. The project includes the installation of permanent turbine foundations, crane pads, and associated drainage, as well as the construction and upgrading of internal access tracks and existing tracks and associated drainage infrastructure. One main site entrance (off Regional Road R419) will be created, and an existing site entrance to the south will be upgraded.

Infrastructure works encompass extensive drainage and sediment control systems, including interceptor drains, cross drains, sediment ponds, and swales, as well as the installation of new watercourse crossings, including single-span bridge, open bottomed culvert and piped culvert within the Site. Removal and replacement of existing culverted watercourse and drain crossings along the cable route will also be required. A permanent 110 kV on-site electrical substation and compound will be constructed, with underground cabling linking turbines to the substation. Additional works include earthworks, peat and spoil management, and the installation of medium voltage electrical and communication cabling underground from the proposed turbines to the proposed on-site substation and Bracklone Substation. Accommodation works along the Proposed Turbine Delivery Route will also be implemented.

Refer to Chapter 2 of the EIAR for a detailed description of the Proposed Development.

1.3.2 Turbine Delivery Route

The Turbine Delivery Route will exit the M6 at junction 5 and continue southbound on the N52 southbound for 8.6km, then taking the second exit on the Ardan Roundabout and continuing on the N52 southbound for 2.9km which includes taking the second exit at Cappancur Roundabout to stay on the N52. At the Cloncollog Roundabout, take the first exit onto the R420 and continue south-east bound on the R420 for 6.6km. Then turn northbound onto the R402 and continue northbound on the R402 for 8.3km including going through the village of Ballinagar. In the village of Daingean, turn onto the R402 Edenderry and continue on the R402 eastbound for 5.6km. Then turn southbound on to the R400 and continue on the R400 southbound for 14.8km. Finally turn northbound on the R419 and continue northbound for 1km before arriving at the Site Entrance.

The TDR will be confined to the public road corridor except for locations where accommodation works will be required to facilitate the delivery of abnormal loads. The works to facilitate the delivery of turbine components to the Site are detailed in Chapter 2 of the EIAR. Please also refer to the Pell Frischmann Route Survey Review (RSR) in Appendix 2.3 and the Dara Energy Ltd. Amended Turbine Delivery Route Assessment Report in Appendix 2.4, EIAR Volume III.

A Traffic Management Plan is included in Appendix 14.1, Volume III of the EIAR. The objective of which is to always maintain the strategic capacity of the national routes, cognisant of the National Development Plan, 2021 – 2030, and to maintain all roads to a robust and safe standard for users. The Developer will adopt and further develop the Traffic Management Plan for agreement with the local Planning Authorities (Kildare County Council, Offaly County Council and Laois County Council) in advance of construction.

1.3.3 Grid Connection

It is proposed to connect the development to the national grid via underground cable to the existing Bracklone 110kV substation. Grid connection works joining the onsite 110kV substation to the existing 110kV Bracklone Substation. The grid connection will require 11.4km of underground 110kV electrical cabling. Works for the grid connection will involve trenching, laying of ducting, installing joint bays and watercourse crossing, pulling cables and the back filling of trenches and reinstatement works. The route which will run through 9.1km of existing public road, 0.3km in existing tracks and 2km in new access tracks on the wind farm site.

Connection works from the onsite substation to Bracklone substation will involve the installation of ducting, joint bays and ancillary infrastructure and the subsequent running of cables along the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces. Details of proposed grid connection infrastructure are provided in planning application drawings.

It is expected that full road closures will be put in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area. These works will be undertaken on a rolling basis with short sections closed for short periods before moving onto the next section. This is described in more detail in Chapter 14 - Traffic and Transportation and Section 6 of Appendix 2.1B Grid Connection Construction Methodology.

In advance of the construction phase cable detection tools, a ground penetrating radar and slit trenches will be used, as appropriate, to verify the exact locations of existing services. The final locations of the proposed cable routes in the public roads and in the verge along the public road will be within the area indicated and assessed in this EIAR and will minimise conflicts with other services.

2. EXISTING ENVIRONMENT

2.1 Existing Environment Descriptions

2.1.1 The Site

The Wind Farm site comprises approximately 213.67 hectares of land, and is contained within the townlands of Cushina, Clonsast Lower, and Chevychase or Derrynadarragh in County Offaly, and Aughrin and Derrylea in County Kildare. It is located within both the jurisdictions of Kildare County Council and Offaly County Council, approximately 1.7km south of the village of Bracknagh, 5km northwest of Monasterevin, and approximately 6.5km northeast of Portarlington.

The Wind Farm site is in a sparsely populated rural context. The settlement patterns in the area consists of one-off rural housing fronting onto the road network in a linear rural settlement pattern. The Site is located within the lowland topography with predominantly flatlands and is located on the Derrylea Bog which is connected to Clonsast Bog to the north and Derryounce Bog to the west.

The Corrine Land Cover database for Ireland (based on interpretation of satellite imagery and national vector mapping data) identifies Quaternary deposits present at the site mostly comprise cut over raised peat. There are sections in the north and west of the site that are underlain by till derived from limestones, while the eastern section of the site is underlain by lake marl. The site is predominantly underlain by the Lucan Formation (dark limestone and shale) with a section in the north of the site underlain by the Ballyadams Formation (crinoidal wackestones/packstone limestone).

The main hydrology features within and adjacent to the proposed wind farmlands are the Figile River located immediately to the east of the proposed site. The Cushina River located within the southern section of the proposed site joins the Figile River approximately 1.2km to the east of the site. The Figile River then joins the Barrow River approximately 4.5km south-east of the site. This provides a connection to the River Barrow_090 lying to the south of the site.

According to the National Indictive Fluvial Mapping (NIFM) and Catchment Flood Risk Assessment, there are past flooding events extent associated with the Barrow County Kildare Drainage. Portions of the application site are contained within the flood extents of the River Cushina.

There are 2 no. European sites designated for nature conservation occur within a 5km radius of the potential wind farm site, the River Barrow and River Nore Special Areas of Conservation (SAC) (Site code: 002162), and the Grand Canal Proposed Natural Heritage Area (pNHA) (Site code: 002104).

The proposed wind farm site has designation for a number of habitats that are of ecological importance including treelines to the west of the site, woodland to the south-west and lowland rivers within the Cushina River. The proposed wind farm site also has designation for a number of fauna on site which include records of hare, a moderate-high value of Irish bat species, otter associated with the Cushina River and a number of identified badger sets within the site. The proposed site also has a number of river catchments located within the proposed site including the River Barrow Watercourse, River Figile Watercourse and the River Cushina Watercourse which are all dominated by coarse fish species.

3. OVERVIEW OF CONSTRUCTION WORKS

3.1 Construction Period

The construction of the Proposed Development in its entirety is expected to take 24 months.

3.2 Overview of Construction Sequence

The construction of a wind farm project is a major infrastructural project. The construction of this Project will involve many inter-related, inter-dependent and overlapping elements of a complex nature.

The following section outlines the construction methodology for the Project. Upon mobilisation for the construction of the development, peat excavation (where required), upgrading of existing site tracks, felling and the provision of new site tracks will precede all other activities. Construction stage drainage infrastructure will be constructed in parallel with the site clearance and track construction, elements of which will be adopted into and will accord with the Site's operational drainage as set out in the Planning Drawings. This will be followed by the construction of the turbine foundations and the provision of the hardstanding areas. In parallel with these works the on-site electrical works; sub-station and internal cable network will be constructed. The proposed grid connection works are anticipated to commence during month 13 in parallel of the proposed on-site wind farm works.

The proposed construction programme is presented in Table 3-1 below.

Table 3-1: Construction Programme

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation and Site Setup	■	■																						
Site Clearance and Felling	■	■																						
Internal Access Tracks	■	■	■	■	■	■	■	■	■	■	■	■												
Crane Hardstandings			■	■	■	■	■	■	■	■	■	■	■	■										
Turbine Foundations								■	■	■	■	■	■	■	■	■	■	■						
TDR Accommodation Works									■															
Turbine Installation															■	■	■	■	■	■				
Onsite Substation										■	■	■	■	■	■	■	■	■	■	■	■			
Private Electrical Network															■	■	■	■	■	■				
Grid Connection Works													■	■	■	■	■	■	■					
Testing and Commissioning																				■	■	■	■	
Landscape and Demobilisation																							■	■

3.3 Overview of Construction Methodology

Method statements are presented below for the key elements of the construction process. The contractor for the main construction works will, following appointment, take ownership, expand upon and generally develop these method statements appropriately for the construction stage, in accordance with this CEMP.

The proposed construction methodology is summarised under the following headings:

- Site Entrances;
- Temporary Site Compounds;
- Felling;
- Concrete Washout and Wheel Washing;
- New Site Access Tracks;
- Upgrade of Existing Internal Access Tracks;
- Drainage and Watercourse Crossings;
- Crane Hardstands;
- Turbine Foundations;
- Substation Compound;
- Electrical Works;
- Internal Wind Farm Cable Works;
- Turbine Installation;
- TDR Accommodation Works.

The construction methodology of the GC works is contained in Appendix 2.1B Grid Connection Construction Methodology. Any temporary reinstatement of road excavations associated with the GC will be as follows, with permanent reinstatement as per TII / Local Authority Requirements:

- Hot works permit to be issued for the area of works for the area to be reinstated.
- A grader (if required), Roller and mini-patch planer will be delivered to site by low-loader. A 2 - in - 1 Tar - and Chipper or patch sprayer will be driven to site.
- A mini patch planer will be attached to a skid steer and will plane a fresh cut line along the verge of the trench.
- The trench fill material will be graded to shape the trench to match the existing camber of the carriageway and compacted using a drum roller.
- The Tar - and - Chipper will make first pass of one metre wide.
- Once the bitumen emulsion and chips have been dispensed from the 2- in 1 Tar and chipper and the drivers cab is clear of the area, the roller will follow and compact the chips into the emulsion.
- If the 2 - in - 1 - Tar - and - Chipper is not being used, a towable emulsion sprayer will be used. This involves the towable sprayer being towed by a pickup truck, and an operative spraying the trench area by means of a lance from the unit.
- The emulsion is heated up to 70°C.The operator will wear protective overalls, heat resistant gloves and eye protection.

- The emulsion is sprayed out to cover the existing trench fill where a follow up crew will spread surface dressing chips over the sprayed area at a safe distance of 5m from the lance.
- Compaction will then take place by a drum roller.
- Both the 2 - in - 1 - Tar - and - Chipper and towable sprayer will have internal diesel burners, with no exposed naked flame.
- Delay set macadam may also be used, 75mm of delay set macadam shall be placed within the trench at the end of each working day, by means of skid steer and trench reinstatement bucket and compacted.

Figure 3-1: Towable Sprayer for Temporary Reinstatement

3.3.1 Site Entrances

The Proposed Wind Farm will include a new site entrance along the R419 Regional Road to serve as construction and operation access to the proposed wind farm and onsite 110kV substation, an additional access from L-70481 will be used for construction on the south of the river Cushina, prior to completion of the bridge crossing.

In order to provide access to the bridge crossing location for HGVs, approximately 800 m of new wind farm access track will need to be constructed. A temporary compound will also be constructed upon mobilization which is located near the southern site access.

The construction activities associated with the works will include:

- Heavy Goods Vehicles (HGVs) transporting materials to and from the site, including road making materials, concrete, building materials, drainage/ducting materials and excavated material.
- HGVs transporting conventional earthworks machinery such as excavators, dumper trucks and rollers.
- Fuel trucks transporting fuel for plant to the southern site compound.
- Light Goods Vehicles (LGVs) such as cars, 4x4s and vans used by the workers and supervisory staff involved in the construction works.
- Crane mobilization for the lifting of pre-fabricated bridge components.

The construction of the Cushina River bridge crossing is expected to take place over the first 3 months of the construction programme.

Construction vehicles shall make use of the existing road designated as the L-70481 to get within approximately 800m of the crossing location. Beyond this point new access track shall be constructed along the alignment of the proposed wind farm access track. This approach shall minimize the volume of materials required to construct the bridge crossing.

The new site access has been selected with consideration for safety of public road users, construction staff and to ensure that it can be constructed to comply with the requirements of Offaly County Council, Kildare County Council, and TII design requirements for direct accesses.

During the construction phase, standard HGVs shall use the existing southern access, located within Co. Kildare, if transporting materials prior to on-site bridge being constructed. Otherwise, all construction traffic shall use the main northern access, located in Co. Offaly.

The onsite 110kV electrical substation will be accessed from the existing site entrance to the south.

All HGV traffic travelling to the site shall only be permitted to use approved transport routes and site access points as identified in the Traffic Management Plan (TMP) contained in Appendix 14.1, Volume III of the EIAR.

3.3.2 Temporary Site Compounds

During the construction phase, it will be necessary to provide temporary facilities for construction personnel. There will be 2 no. temporary compounds which will include temporary self-contained welfare facilities (e.g. ecopod type) and offices. The location of the temporary site compounds is shown in the Planning Drawings accompanying the application. Wheel wash facilities will be provided within the site near the site entrance point.

The temporary site compounds will be established by removing topsoil down to a firm substrate, laying down geotextile material and then constructing a working surface of stone sourced from within the Site, and surrounded by security fencing. The topsoil will be removed and stored in accordance with the Peat and Spoil Management Plan contained within Appendix 11.3 Volume III of this EIAR.

Temporary facilities will be removed, and the lands reinstated on completion of the construction phase.

Facilities to be provided in the temporary site compounds will include the following:

• site offices, of Portacabin type construction	• employee parking
• Portaloos	• specially constructed bunded fuel / oil storage to ensure that fuel spillages are fully contained (such bunds shall be roofed to exclude rainwater)
• bottled water for potable supply	• contractor lock-up facility
• a water tanker to supply water used for other purposes	• diesel generator (within bunded area)
• canteen facilities	• waste management areas
• material/non-fuel storage areas	

3.3.3 Felling and Site Clearance

Permanent felling of approximately 0.28 ha of forestry is required at the main entrance to the Site. It should be noted that the clear-felling of trees in the State requires a felling licence. The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing which is governed by the Forestry Act 2014 as amended and the Forestry Regulations 2017 (S.I. No. 191 of 2017). A felling licence will include the provision of relevant replant lands (afforestation area) to be planted in consideration for the proposed tree felling on the Site. The associated afforestation of alternative lands equivalent in area to those lands being permanently clear-felled is also subject to licensing ('afforestation licensing').

The area of trees to be felled will be minimised to only that required to accommodate the Proposed Development.

The contractor will not commence tree removal on site until both felling and afforestation licences are in place.

Tree felling, trimming and site clearance will not be carried out during the bird breeding season which commences on March 1st and finishes on August 31st. All site clearance / enabling works will be preceded by survey and inspection by an Ecological Clerk of Works for the presence of any species or habitats protected by Law in accordance with the TII's "Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes". The following confirmatory surveys, as specified within the Biodiversity chapter, will be undertaken by the Ecological Clerk of Works (who will be suitably qualified and competent to undertake such surveys) in accordance with the methodologies set out in the EIAR, prior to the commencement of Construction, in order for the Contractor to ensure the most relevant mitigation measures are included in the Design and Construction:

a) An otter survey 200m upstream and downstream of the footprint of all watercourse crossings to identify holt / couch locations and need for mammal passage/mitigation;
b) A bat survey of trees to be felled in accordance with the NRA Guidelines for the Treatment of Bats Prior To the Construction of National Road Schemes (a visual inspection of the tree during daylight hours followed by a nighttime detector survey);
c) A badger survey within 150m of all works areas;
d) A common frog surveys along all drain crossings (and spawn survey) during the breeding season of common frog (approximately January – midsummer). Spawn translocation may be required under licence where active breeding drains are within the development footprint during the construction phase.
e) An invasive plant species survey of all watercourses and lands within the footprint of the Works.

If any such species or habitats are found, as a result of such survey and inspection, the Contractor will undertake the following:

- Record and report the ecological data in accordance with the requirements of the National Biodiversity Data Centre (NBDC);
- If mitigation measures for such species or habitats have not been identified in the EIAR for that area of the Site, the Contractor will, consult with the National Parks and Wildlife Services and the Inland Fisheries Ireland as appropriate to determine and implement appropriate mitigation for the species / habitat.

3.3.4 Concrete Washout Area and Wheel Washing

Detailed measures to control concrete runoff during the Construction stage of the Proposed Development are included in Chapter 12 - Flooding, Hydrology & Water Quality of the EIAR and will be implemented as part of the Works. A summary is provided hereunder.

All concrete will be delivered to site via ready-mix trucks from a local supplier.

Concrete trucks will not be washed out on Site. Where chutes, hoppers/skips and equipment (e.g. vibrating wands) associated with concrete works need to be washed down this will be done into a sealed mortar bin / skip with the appropriate capacity, and which has been examined in advance for any defects. The location of wash down areas will be set back as far as practically possible from any drain or watercourse, and a minimum of 50m. The residual liquids and solids will be disposed of off-site at an appropriate licenced waste facility, as shown in Table 4-2 of this CEMP.

Wheel wash facilities will be located near the site entrance to reduce construction traffic fouling public roads. Each wheel wash will come with an additional water tank which will be filled regularly. These units will be self-contained and will filter the waste for ease of disposal. Silt will be removed from each unit and from site by a licensed contractor.

3.3.5 New Site Access Tracks

The Proposed Wind Farm will include the construction of 9.36 km of new internal access tracks and the upgrading of 0.55km of existing tracks and associated drainage infrastructure. The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operational phase and for vehicles to decommission the turbines at the end of the life of the Proposed Development. The internal road layout has taken into account the following key factors:

- Buildability having regard to existing ground conditions and land drainage;
- Minimise watercourse crossings;
- Sustainability by avoiding habitats of higher value and making use of existing tracks and roads;
- Optimising cut/fill balance.

All access tracks will be approximately 4.5-5 m wide along straight sections and wider at bends as required. The tracks will be finished with a well graded aggregate. The drainage system will be installed adjacent to the internal access tracks.

Internal wind farm access tracks shall be a constructed by a combination of founded and floating methods as required. There is approximately 2.1km of floated access track within the site which has been determined by geotechnical walkovers and detailed site investigations.

Floating Method

Floating roads are constructed without excavating the existing ground. They will consist of a layer of combined geotextile and geogrid laid directly on the existing surface. Layers of stone will then be placed on top with additional geogrid reinforcement as required. A layer of compacted Cl 804 material will be placed on top to provide a suitable running surface. It is anticipated that the stone required for the construction of the internal access roads will be sourced from quarries in the vicinity.

Typically, the track formation will consist of a minimum 500 mm hardcore on geo-textile membrane. The likely construction methodology for newly constructed tracks will be as follows:

- The formation will be prepared to receive the geotextile membrane.
- Stone will be placed and compacted in layers to minimum 500 mm depth.
- A drainage ditch will be formed, within excavated width, along sides of the track.
- Surplus excavated material will be placed along the side of sections of the tracks and dressed to blend in with surrounding landscaping and partially obscure sight of the track.

Where the underlying peat has insufficient bearing capacity or due to topographic restrictions an excavate and replace type access road may be more suitable, although this is not anticipated at the location of the floated roads.

Founded Method

This method will consist of either one or two layers of stone depending on the load bearing capacity of the base layer. Where the underlying layer is mineral subsoil, two layers of stone are used; a stone capping layer and running layer. Construction details are outlined in the planning drawings.

In areas where the load bearing layer is rock, the capping layer is omitted, and the running layer is installed directly onto the rock surface. Drainage runs and associated settlement ponds will be installed.

Track construction details will be implemented as follows:

- Establish alignment of the new site tracks from the construction drawings and mark out the centrelines with ranging rods or timber posts.
- The access tracks will be of single-track design with an overall width of 5m. There will be some local widening on the bends as shown on the design drawings, junctions and around Turbine Foundations for the safe passage of large vehicles. All bends have been designed to suit the requirements of the delivery vehicles.
- All machinery shall work within the consented areas as identified on planning and contract drawings.
- All access for construction vehicles within the site will follow the proposed internal access tracks as shown in planning drawings.
- Topsoil/subsoil will be stripped back to required levels. Excavated material will be placed along the side of sections of the tracks and dressed to blend in with surrounding landscaping and partially obscure sight of the track.
- The soil will be excavated down to a suitable formation layer of either firm subsoil or rock.
- The formation will be prepared to receive the geotextile membrane.
- Well-graded granular fill will be spread and compacted in layers to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Site Manager based on the characteristics of the material and the compaction plant to be used.
- Batters will have a slope of between 1:1 and 1:5 (depending on depth and type of material) and will be left as cut to re-vegetate naturally with local species.

3.3.6 Upgrade of Existing Internal Access Tracks

There is 0.55km of existing track upgrades and associated drainage infrastructure required. Existing track upgrades shall follow the same outline methodology as for new access tracks.

Existing drainage infrastructure will be maintained and upgraded where necessary and to the same standard as the proposed drainage infrastructure in accordance with the drainage design and Surface Water Management Plan (within the Appendix 12.2 Volume III of this EIAR). Any new drainage systems required will be installed adjacent to the internal access tracks.

3.3.7 Drainage and Watercourse Crossings

A Surface Water Management plan has been prepared which can be found in Appendix 12.2 Volume III of this EIAR. It contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied by the Contractor.

Within the Site there are 35 no. drain crossings and 1 no. watercourse crossing, which are shown in Table 3-1 of the SWMP in Appendix 12.2 Volume III of this EIAR.

It is proposed to install 1 no. clear span bridge crossing where the internal wind farm access track crosses the Cushina River. Refer to Drawing no. P22-145-0300-0001 for details. It is also proposed to install a new watercourse crossing along the TDR comprising a 1 no. single span bridge crossing at Daingean River/Philipstown Bridge to avoid the R400 / R402 junction.

In addition to the above clear span bridge crossings, the design includes 12 no. open-bottomed box culvert crossings and 23 no. piped culverts within the Site.

The proposed crossing designs have been designed in line with Inland Fisheries Ireland (IFI) requirements for salmonid watercourses as included in their 2016 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' and TII 2008 'Guidelines for the Crossing of Watercourses During the Construction of Road Schemes'. Details of proposed crossing structures are presented in 0500-Series planning application drawings.

Drainage design and watercourse crossing details can be found on the 100 series and 500 series planning drawings.

Clear Span Bridge Details and Construction Methodology

The abutments for the bridge will be founded on reinforced concrete pad footings. An excavator will be used to reach the subgrade on which the concrete pads will be founded. The excavations will be set back 2.5m from the banks of the river. Based on site investigations the approach embankments to the bridge structure can be founded directly on existing stratum.

Dewatering of the excavations as per the Surface Water Management Plan will likely be required through sump pump or alternative means until completion of the footings. A layer of Class 6N2 fill will be laid as a regulating layer on top of the subgrade. A 75mm thick blinding concrete will be placed over the full extent of the rectangular foundation to produce a clean flat surface for the wet structural foundation concrete. The reinforcement cage for the pad footing will be fixed and tied with bars protruding vertically for subsequent concrete pours. Formwork will be placed around the perimeter of the footing ensuring sufficient concrete cover to the reinforcement. Approximately 18m3 of concrete will be required for each abutment bank seat pad and will be delivered to site by ready mix trucks. The concrete will be placed in the formwork using a hopper or concrete pump and vibratory poker used to remove air bubbles.

Once the pad footing has achieved sufficient strength, the reinforcement for the abutment upstands will be cut, tied and fixed into position. A vertical formwork will be placed around the perimeter of the abutment wall. Each abutment upstand will require approximately 13m3 of concrete which will be placed using a hopper or concrete pump. A vibratory poker will be used to remove any air pockets. Once the formwork has been removed and the concrete has cured, a waterproofing membrane will be applied to the concrete. At the top of the upstands, seatings for the precast deck beams will be prepared at the correct levels.

The bridge deck will be set above the 1% AEP flood height (100-year event) and will be made up of precast concrete beams with a clear span of c.15m. The beams will be precast off site and delivered to site on a flatbed truck. A crane will be used to lift the beams into position onto the seatings formed on top of the abutment upstands. Side forms for the edge parapet beams will be secured and reinforcement for the deck slab and parapet edge beams will be cut, tied and fixed into position with bars protruding vertically from the edge beams for subsequent concrete pours for the concrete parapets. The bridge deck slab and edge beams will be concreted to the finished level. Once the deck slab has reached sufficient strength the abutment walls will be backfilled with a granular fill to access track formation level.

The bridge deck parapets will be constructed from reinforced concrete. Reinforcement for the parapets will be fixed to lap with the starter bars from the edge beams. Vertical formwork will be erected and secured in place. An in-situ pour will be carried out to cast the parapets to the design height and vibratory poker used. Once the parapets have reached sufficient strength the formwork will be stripped. The deck surfacing is to be formed using an ST1 concrete mix. This will be placed on top of the deck slab with a minimum thickness of 100 mm and with a crossfall from the centre of the deck to the parapet to allow water to drain.

Ducts for the later pulling of power and communication cables for the wind farm will be pre-cast into the bridge deck sections.

Construction of the water crossing will be scheduled to align with fisheries seasonal restrictions and will not be undertaken during a period of flooding.

Vehicular access to the crossing location shall be available from both sides of the watercourse.

The access track on the approach to the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the watercourse crossing.

All drainage measures, including check-dams and /or silt traps, along the proposed access track will be installed in advance of the works along with the first layer of access track construction.

All earthworks adjacent to the crossing locations will be carried out to prevent soil entering the watercourse and will be in accordance with the Soil Management Plan.

Further details on hydrology and drainage are contained in Chapter 12 - Hydrology and Water Quality, the Surface Water Management Plan (SWMP) which is contained in Appendix 12.2 Volume III of this EIAR and on accompanying planning application drawings.

Bottomless Culvert and Piped Culvert Construction Methodology

Culverts will be made of precast units which will be sized specific to the hydraulic capacity required relative to the characteristics of the watercourse to be crossed. The crossing angle for the culverts will be set out in relation to access track alignment and the existing watercourse channel. The project engineer will determine the required gradient of the culvert. Standard details for piped and bottomless culverts are provided in the Planning Drawings.

The access track on the approach to the channel will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the culvert crossings.

The culverts will be installed on-line (i.e. within the existing channel) and the works will be carried out under dry conditions in accordance with IFI (2016) 'Guidelines on protection of fisheries during construction works in and adjacent to waters'. The watercourse flow will be diverted by over pumping or by fluming the flow as appropriate to facilitate construction of the culvert in dry conditions. The installation of the culvert will take place in low flow conditions. Mitigation for the protection of sensitive biological receptors when fluming / over pumping are presented in Chapter 9 – Biodiversity.

For piped culvert, the bed of the watercourse will be taken down to the desired levels to create a suitable platform for laying the culvert. The pipe culvert will be lifted into place with excavator with a lifting mechanism / crane and will have an invert level 500 mm below the existing watercourse bed level. The embedded section will be allowed to fill naturally.

For bottomless box culvert, the base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix foundation and concrete panels. The base will be excavated along the stream bank with no instream works required. The bottom plate of the culvert will be bolted to the foundation on both sides of the watercourse. The top section of the culvert will be bolted together and lifted into position and bolted to the two bottom sections. Once the culvert is in position stone backfill will be placed and compacted against the culvert up to the required level above the foundations. A concrete beam will then be shuttered, fixed and poured along the two shoulders of the culvert. When the concrete beams are cured the filling and compaction of the access track will be completed.

Minor Stream / Drain Crossing Construction Methodology

All minor streams or drains within the Site (not identified as Rivers by the EPA in their reporting under the Water Framework Directive) which are crossed by the wind farm infrastructure will be collected by interceptor drains and carried under the access track by cross drains. Further details on the locations of such cross drains are provided in the Surface Water Management Plan in Appendix 12.2 Volume III of this EIAR and on accompanying planning application drawings.

The cross drains will be an appropriately sized pipe buried in the sub-base of the access track at the necessary invert level to ensure ponding or pooling doesn't occur above or below the cross drain and water can continue to flow as necessary.

For a minor stream/drain crossing the following will be employed:

- The access track construction will finish at least 10m from the nearside bank of the minor stream/drain.
- All environmental mitigation measures, described in detail in Chapter 12 - Hydrology and Water Quality and Chapter 9 - Biodiversity, will be implemented locally in advance of the works, in accordance with the measures outlined in the Surface Water Management Plan (SWMP) in Appendix 12.2 Volume III of this EIAR.
- The pipe is laid in one lift or in sections using a lifting mechanism attached to an excavator.
- Rock armour headwalls will be constructed where necessary to protect pipe ends and the base of slope embankments on either side of the track.

Instream works will only take place during the period July to September (as required by IFI for instream works).

Operation of machinery in-stream will be kept to an absolute minimum. All construction machinery operating in-stream will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be checked prior to commencement of in-stream works.

Before contact with water is made, any equipment or machinery that will be used in the water, including Personal Protective Equipment (e.g. footwear, gloves), will undergo the Clean-Check-Dry biosecurity protocol: https://www.fisheriesireland.ie/Biosecurity/biosecurity.html. This will similarly be carried out upon completion of the work or moving the equipment or machinery from the water.

3.3.8 Turbine Hardstands

All crane pads and associated splays have been designed taking account of the loadings provided by the turbine manufacturer. They will consist of a compacted stone structure in accordance with the detailed engineering designs and employer's requirements.

All crane pads will be formed from a suitably stiff layer of subsoil or rock. The finished crane pad surface will provide a minimum bearing capacity of 260kN/m².

Crane pad and associated splay formation will consist of either 1 or 2 layers of suitable fill material depending on the properties of the underlying load bearing layer. Where the underlying layer is soft soil, 2 layers of suitable fill formation will be used and the stone capping layer. In areas where the load bearing layer is rock, the capping layer will be omitted, and the running layer will be installed directly onto the rock surface.

A turbine hardstanding area consists of a main crane pad hardstanding of 80 m x 33.5 m (2,700 m^2) with a number of additional smaller hardstandings that act as ancillary crane pads and set down and assembly areas, located as shown on the accompanying planning drawings. This area will accommodate a main crane and an assist crane during the assembly of the turbine, as well as during occasional maintenance periods during operation. It will also facilitate parking for operation and maintenance staff. The crane pads will have a maximum cross and longitudinal fall tolerance of 2%. The crane hardstands will be constructed using a typical excavation method.

The excavation method can be summarised as follows:

Excavation Method:

All environmental mitigation measures will be implemented locally in advance of the works, in accordance with the measures outlined in the environmental management plan in Section 4 of this CEMP.

- Establish alignment of the hardstands from the construction drawings and mark out the corners with ranging rods or timber posts.
- Drainage runs and associated settlement ponds will be installed.
- Topsoil and subsoil stockpiles will be formed, and the side compacted to prevent silt run off during heavy rain or airborne dust during dry periods.
- Batters will have a slope of between 1:1 and 1:5 (depending on depth and type of material) and will be left as cut to re-vegetate naturally with local species.

3.3.9 Turbine Foundations

Following detailed site investigations, it has been determined that the wind turbine foundations at Derrynadarragh will be standard shallow reinforced concrete foundations. The turbine foundation bases are circular in shape and will be 25 m in diameter and 3.5 m in depth.

Turbine foundations will be designed to Eurocode Standards. Foundation loads will be provided by the wind turbine supplier, and factors of safety will be applied to these in accordance with European design standards:

- EN 1992-1-1: Eurocode 2: Design of concrete structures.
- BS EN 61400-1:2005: Wind Turbines Design Requirements.

The wind turbine foundations will be constructed using standard reinforced concrete construction techniques. A section of reinforced concrete foundation called a plinth shall protrude above ground to which the turbine tower will be bolted as per the turbine manufacturer's guidelines which will be incorporated in the civil foundation design.

The turbine foundations will be constructed as follows:

Standard Excavated Reinforced Concrete Base:

f) The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter.

g) No material will be removed from site and storage areas will be stripped of vegetation prior to stockpiling placement in line with best working practises.

h) Around the perimeter of the foundation formation a shallow drain will be formed to catch ground water entering the excavation. The drain will direct the water to a sump if required where it will be pumped out to a settlement pond away from the excavation.

i) A layer of concrete blinding will be laid approximately 75mm thick directly on top of the newly exposed formation, tamped and finished with a screed board to leave a flat level surface. If required, geogrid and soil replacement will be laid according to the foundation design, followed by placement of the concrete blinding layer.

j) If soil replacement is required, the aggregate used will be tested and approved by the project geotechnical engineer.

k) High tensile steel reinforcement will be fixed in accordance with the designer's drawings & schedules. The foundation anchorage system will be installed, levelled and secured to the blinding using steel box section stools.

l) Ductwork will be installed as required, and formwork erected around the steel cage and propped from the backside as required.

m) The foundation anchorage system will be checked both for level and line prior to the concrete being installed in the base.

n) Concrete will be placed using a concrete pump and compacted using vibrating pokers to the levels and profile indicated on the construction drawings.

o) Upon completion of the concreting works the foundation base will be covered from the elements that could cause hydration cracking and/or delay setting in any way.

p) Steel shutters will be used to pour the upper plinth section.

q) The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation and landscaped using the top-soil set-aside during the excavation. The suitability of backfill material will be approved by the project geotechnical engineer.

r) A gravel footpath will be formed from the access track to the turbine door and around the turbine for maintenance.

3.3.10 Substation Compound

The footprint of the proposed on-site (TSO) 110kV substation compound measures approximately 5,250m^2 in area and will include 1 no. control building (18m x 25m and 7.4m high) and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the on-site 110kV substation to the national grid.

The building's main function is to provide housing for switchgear, control equipment and monitoring equipment necessary for the proper functioning of the substation and wind farm. The building will be constructed by the following methodology:

- The area of the control buildings and compound will be marked out using ranging rods or wooden posts and the vegetable soil stripped and removed to the nearby storage area for later use in landscaping. No material will be removed from site and storage areas will be stripped of vegetation prior to stockpiling in line with best working practises.
- Drainage runs and associated settlement ponds will be installed.
- The dimensions of the Building and Compound area will be set to meet the requirements of EirGrid and the necessary equipment to safely and efficiently operate the wind farm.
- The foundations will be excavated down to the level indicated by the designer and concreted.
- The blockwork walls will be built up from the footings to DPC level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors.
- The blockwork will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation.
- The concrete roof slabs will be lifted into position using an adequately sized mobile crane.
- The wooden roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.

The remainder of the substation compound will be brought up to the agreed formation and approved stone imported and graded to the correct level as per the detail design.

Equipment plinths will be marked out, excavated and constructed using in-situ reinforced concrete or pre-cast concrete. Provision will be made in each plinth for earth connection.

Following the construction of the equipment plinths an earth mat will be installed throughout the compound. This will be connected to each plinth and the buildings as per the electrical earth protection design.

3.3.11 Electrical Works

3.3.11.1 Substation Fit Out and Switchgear Installation

The substation will have a domestic electrical system including lights, sockets, fire alarm and intruder alarm. The high voltage switchgear for the wind farm will be installed through the following method.

- The switchboard units will be delivered to site on a truck and unloaded using a forklift, front end loader or HIAB crane.
- Suitable task specific RAMS and lifting plans will be in place prior to the commencement of all works.
- The switchgear will be unloaded on to a concrete plinth directly outside the substation building.
- The units will be moved inside the substation building using a hand driven forklift and positioned over the internal trench supports, prepared previously.

- The switchgear will then be secured as per manufacturer's instructions, typically by bolting directly to steel support bars over the trench.
- The building is fitted out with small light and power and ancillary wind farm control equipment such as SCADA computer, remote telemetry units, metering etc.
- All equipment and fittings are then connected, wired tested and commissioned in accordance with the Electrical Contractor's commissioning plan.

3.3.11.2 Transformers

- The turbine transformers will be placed directly onto the turbine foundation upon delivery to site, prior to the installation of the turbine towers.
- The transformers will be of the sealed type and will be inspected for any damage prior to offloading. It is proposed that the units will be installed using a small mobile all-terrain crane and will be tested, commissioned and energised by suitably trained and authorised persons.
- The accessible sections of the transformer will be protected within an enclosure which will be locked at all times and displaying appropriate warning signs.
- Transformers and ancillary plinth-mounted equipment required in the substation compound will be delivered to site and unloaded directly in place by HIAB crane or similar.
- Suitable task specific RAMS and lifting plans will be in place prior to the commencement of all works.

3.3.12 Internal Wind Farm Cabling Works

The specification for cable trenches is based on cable voltage, location and existing land use. If, subject to confirmatory surveys, the land is not as expected, the route may need to be varied within the parameters set out and assessed in the EIAR.

With a trefoil formation, the internal cable trench width will be 600 mm, and with a flat formation, the trench width will be 1200 mm. The depth of cover to the ducts carrying the cables will be 900 mm to the top of the upper ducts. The depth of trench for the cables will be 1200 mm. The diameter of the ducting will be selected to suit the range of cross-sectional areas of electrical cables and is likely to fall between 100 mm and 200 mm diameter.

Internal cable trench section types associated with on-site electrical cabling are presented in the accompanying planning application drawing P22-145-0500-0004.

The following describes the construction methodology for cable installation works inside the Site. Some cables will be buried directly, and some will be ducted. Direct buried cables will be used in non-load bearing areas and ducts will be used in load bearing areas.

For direct buried cables, the following outline methodology will be implemented:

- All environmental mitigation measures will be implemented locally in advance of the works, in accordance with environmental management plan outlined in Section 4 of this CEMP.
- The line of the cable trench will run beside the site access tracks until it exits to the public road.
- The ground will be excavated using a mechanical digger. The top layer of soil will be removed and placed to one side. It will be used for landscaping the top of the backfilled cable trench following the laying of the cables. The remaining subsoil, excavated to the required depth, will be placed separately and used as backfill for the trench.
- Safe ladder access/egress to trenches will be provided into the trench.
- The cables will be laid directly onto a bed of suitable material, free from sharp stones and debris*.

- A suitable material will be placed over the top of the cables to protect them during backfilling*.
- Warning tape and plates will be installed by hand in accordance with the trench design and ESBN specifications and the engineer's design.
- On completion, the ground will be reinstated, and marker posts will be positioned at agreed centres to the side of the trench highlighting the presence of cables below.
- Trenches will vary in width depending on the number of cables in the circuit. Where there is more than one set of cables they will be separated as per cable manufacturers and ESB/ EirGrid requirements.

Where ducting is required within the Site (i.e., for areas where cables will be laid under access tracks or other loaded surfaces), suitable ducting will be required to protect the cables. In this scenario, tasks marked by an asterisk (*) in the above methodology will be replaced by the following steps:

- Ducts will be placed into the trench manually, having been delivered to roadside embankment/verge by tractor and pipe trailer and then offloaded by hand.
- Approved bedding material will be used to surround the ducts. It will be delivered straight from a concrete truck or by skid steer along the route.
- Approved fill material will be compacted above and below the power cable ducting as per the engineer's design.
- Exposed duct ends will be capped.
- A 12mm Draw rope will be blown through the ducting at later date.
- Small jointing pits will be located along the route of the trench which will be left open until jointing takes place. A protective handrail/ barrier will be placed around each pit for health and safety reasons.
- Once the cables are joined and sealed the jointing container will be removed and the cables at the joint-bay locations will be back-filled in the same manner as the rest of the cable trench.
- The cables will connect the turbines to the substation. Ducts will be cast into each turbine foundation to provide access for the cables Likewise, at the substation, ducts will be cast through the building foundation to provide access for the cables.
- There are no existing buried services expected within the site however the appointed contractor will be responsible for carrying out pre-construction confirmation surveys ahead of construction.
- Prior to commencement of the works, up to date records of services such as watermains, sewers, gas mains and other power cables will be obtained from the relevant service providers. Cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to find the exact locations of existing services. The final locations of the cable trenches will be selected to minimise conflicts with other services.
- Trenches where ducts are laid will be back filled every evening. During excavation works signage will be erected at each location warning of the dangers.

3.3.13 Turbine Installation

Each wind turbine will have an associated turbine hardstand area and temporary laydown area adjacent to the foundation to accommodate the delivery and temporary storage of the turbine components prior to their erection and to support the cranes during erection.

Once the turbine components arrive on site they will be placed on the hardstand and lay down areas prior to assembly. The towers will be delivered in sections, and each blade will be delivered in a separate load within the convoys. Once there is a suitable weather window the turbine will be assembled.

It is anticipated that the turbine installation works will take place over the course of 6 months. This is based on a total of 7 no. loads per turbine to deliver blades, tower sections and nacelles, with each convoy consisting of components for two turbines at a time.

3.3.14 Fencing and Site Security

Temporary Heras fencing will be erected surrounding the construction compounds. Access will be gated to prevent unauthorised access. CCTV will be in operation.

The on-site 110kV substation compound will include steel palisade fencing (2.6m high as required by ESB), and internal fences will also segregate different areas within the main substation. Fence details are shown on the accompanying planning application drawings.

3.4 Construction Working Hours

The hours of construction activity will be limited to avoid unsociable hours where possible as per Section 8.5 (d) of the code of practice for BS 5228: Part 1: 1997. Construction operations will generally be restricted to between 07:00 hours and 19:00 hours Monday to Saturday. It should be noted that it may be necessary to commence turbine base concrete pours earlier due to time constraints incurred by the concrete curing process. Work on Sundays or public holidays will only be conducted in exceptional circumstances or in an emergency. Additional emergency works may also be required outside of normal working hours as quoted above.

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 Introduction

This Environmental Management Plan (EMP) defines the work practices, environmental management procedures and management responsibilities relating to the construction of the Proposed Development. This plan should be read in conjunction with the EIAR.

This EMP describes how the Contractor for the main construction works will implement a site Environmental Management System (EMS) on this project to meet the specified contractual, regulatory and statutory requirements and identified mitigation measures. This plan will be further developed and expanded following the grant of planning permission and appointment of the Contractor for the main construction works (in accordance with the parameters and measures set out in this EMP). Please note that some items in this plan can only be finalised with appropriate input from the Contractor who will carry out the main construction works and once the planning conditions are known. It is the Contractor's responsibility to implement an effective EMS to ensure that environmental requirements for the construction of this Proposed Development are met.

All site personnel will be required to be familiar with the EMP's requirements as related to their role on site. The plan describes the project organisation, sets out the environmental procedures that will be adopted on site and outlines the key performance indicators for the site.

- The EMP is a controlled document and will be reviewed and revised as necessary (to comply with planning conditions or other local authority requirements).
- A copy of the EMP will be located on the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of and understand the EMP and its contents.

This section includes the mitigation measures which will be implemented by the contractor and client during the construction, operation and decommissioning of the Proposed Development as per the EIAR and NIS.

4.2 Project Obligations

In the construction of the Proposed Development there are a number of environmental management obligations on the developer and the contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR and NIS. This CEMP will be updated by the main contractor following appointment and will only be revised as set out above. The contractor and all of its sub-contractors will be fully aware of and in compliance with these environmental obligations.

4.2.1 EIAR/NIS Obligations

The EIAR and NIS identified mitigation measures that will be put in place to mitigate the potential environmental impacts arising from construction of the Proposed Development. Measures identified in the EIAR and NIS are detailed in this CEMP and listed in the Schedule of Commitments which accompany the EIAR. It should be noted that this Schedule of Commitments also includes operational phase and decommissioning phase commitments which are not relevant to the construction phase. The CEMP will be read in conjunction with the EIAR and NIS. In the case of any ambiguity or contradiction between this CEMP and the EIAR and NIS, the EIAR and NIS shall take precedence.

4.2.2 Planning Permission Obligations

All planning conditions attached to the Proposed Development's planning permission will be adhered to. All pre-commencement planning conditions will be discharged fully by the project owner prior to commencement of construction.

4.2.3 Other Obligations

The Developer and/or Contractor for the main construction works will liaise directly with relevant Bodies in relation to securing any necessary permits to allow the works to take place including for example (non-exhaustive list):

- Commencement notice;
- Special Permits in relation to oversized vehicles on public roads;
- Temporary Road Closures (if required);
- Road Opening Licence;
- Building control approval;
- Trade effluent discharge licence / Tankered wastewater agreement;
- Section 50 consent for the construction of bridges or culverts on any drain or watercourse;
- Abstraction licence – registration with EPA;
- Licence, permit or certificate of registration required by the waste producer, haulier and waste facility;
- Tree Felling Licence;
- Licence from national Monuments Service;
- Protected Species licence (noting that the need for same has not been identified at planning stage);

The Developer will also liaise closely with the local residents, especially homeowners and landowners along the local access routes in relation to works and all reasonable steps will be taken to minimise the impact of the development on such persons. A TMP is included in Appendix 14.1, Volume III of the EIAR.

4.3 Environmental Management Plan

This section outlines the EMP associated with the Proposed Development. Table 4-1 below describes the Management Plans that have been prepared as part of the EIAR and CEMP that are included in the Appendices to this CEMP (given their size they are not included in this section). The Management Plans should be read in conjunction with the EIAR. The contents of the management plans will be updated for the construction phase in line with any planning conditions that may apply.

Table 4-1: Management Plans

Management Plan	Location	Description
Traffic Management Plan	Appendix 14.1, Volume III of the EIAR.	The traffic management plan outlines the procedures to be implemented during the construction stage for traffic management at the Proposed Development. In the traffic management plan the proposed haul routes to the site, used for engineering material, equipment deliveries and the turbine delivery route (TDR) (to be used for the delivery of oversized components required for the construction of the turbines) are assessed. Prior to works commencing, the traffic management plan will be revised as necessary by the appointed contractor in consultation with the local authority.
Peat and Spoil Management Plan	Appendix 11.3 Volume III of this EIAR.	The purpose of this is to provide a peat and spoil management plan for the construction phase of the Proposed Development. The intention of the report is to describe how peat and spoil which will be excavated from infrastructure locations such as turbine bases and roads and will be handled and placed/reinstated on site in an appropriate manner. The peat and spoil management plan contains drainage guidelines for construction works and for management of peat on site. It should be noted that the control of water quality and drainage measures for site is outlined in detail in Chapter 12 of the Environmental Impact Assessment Report (EIAR).
Surface Water Management Plan	Appendix 12.2 Volume III of this EIAR	The Surface Water Management Plan contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied when working near water.

4.3.1 Decommissioning Plan

The decommissioning phase works will be completed to approved standards, which include specified materials, standards, specifications and codes of practice (at the time decommissioning takes place).

An experienced main contractor will be appointed to undertake the of the decommissioning of the wind farm development. The main contractor will comply with the Construction and Environmental Management Plan (CEMP) prepared for the construction phase and the Operation and Environmental Management Plan (OEMP) implemented during operation and any revisions made to those documents throughout the phases in which they were adopted. The contractor will produce a detailed and site-specific Decommissioning Plan prior to commencement of decommissioning.

The key site targets are as follows;

- Ensure decommissioning works and activities are completed in accordance with mitigation and best practice approach presented in the accompanying Environmental Impact Assessment Report (EIAR) and associated planning documentation;
- Ensure decommissioning works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure decommissioning works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to decommissioning;
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible, e.g. soil and overburden material for backfilling and reinstatement;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;
- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of decommissioning works to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment.
- Decommissioning methods will be altered where it is found there is the potential to have an adverse effect on the environment;

An overview of the anticipated decommissioning methodologies is provided below.

Wind Turbines

Prior to any works being undertaken on wind turbines, they will be disconnected from the grid by the site operator in conjunction with ESB Networks and EirGrid. The dismantling and removal of wind turbines of this scale is a specialist operation which will be undertaken by the turbine supplier that completed the installation where possible. Turbine dismantling will be undertaken in reverse order to methodology employed during their construction. A number of large-scale cranes will be brought back to site utilising the existing hard stand areas. The dismantling of turbines will be bound by the same safety considerations as was the case during construction in terms of weather conditions where works will not be undertaken during adverse weather conditions and in particular not during high winds.

The turbines will most likely be removed from site in a similar manner to how they were transported to the site originally in extended articulated trucks. The destination of the turbines post decommissioning is unclear at this time as a re-use option may be sourced if early decommissioning occurs. Therefore, the removal of turbines from site is considered in terms of all turbine components being removed intact and as they transported to site.

The transport of disassembled turbines from the site will be undertaken in accordance with a Decommissioning Transport Management Plan which will be issued to and agreed with the competent authority at that time as part of a permit application for the delivery of abnormal loads using the local roads under the Road Traffic (Special Permits for Particular Vehicles) Regulations 2007. The Transport Management Plan will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

The accommodation works along the TDR will not be required for the decommissioning phase as turbine components can be dismantled on site and removed using standard HGVs.

Turbine Foundations

On the dismantling of turbines, it is not intended to remove the concrete foundation from the ground. The foundation pedestals will be covered over and allowed to re-vegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental nuisances such as noise and vibration and dust.

Therefore, the turbine foundations will be backfilled and covered with soil material which will comprise the usable soil or overburden material on the site after construction. The soil will be spread and graded over the foundation using a tracked excavator and revegetation allowed to occur naturally.

It is proposed that all the internal site access tracks and turbine hard standings will be left in place. These will continue to be used for agriculture. Turbine foundation pedestals and hard standings will be covered over with topsoil previously stripped and used for landscaping purposes during the construction stage and left to revegetate naturally.

Underground Cabling

The electrical and fibre optic cabling that connects each turbine will be removed from the cable ducting. The cabling will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the joint bays/pull pits along the cable. The access track will be excavated using a mechanical excavator at each cable pulling pit location and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible.

Grid connection infrastructure including the on-site substation and ancillary electrical equipment will form part of the national grid and will be left in situ.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

4.3.2 Dust Management Plan

This Dust Management Plan (DMP) outlines the sources of dust during the works, identifies measures to minimise dust during the works and the complaints procedure for dust.

Construction stage mitigation measures to minimise dust and emissions will be implemented as follows:

- Construction vehicles and machinery will be serviced and in good working order;

- Receptors which receive dusting and soiling on the haul routes, entering the site; and dwellings directly adjacent to the grid connection route that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required should soiling have taken place;
- Ensure all vehicles switch off engines when stationary – no idling vehicles; and
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be minimised through regular servicing of machinery.

4.3.2.1 Dust Generation and Control

The principal sources of potential air emissions during the construction of the Project will be from the Site, GC and TDR; from dust arising from earthworks, tree felling activities, trench excavation along cable routes, construction of the new access tracks, the temporary storage of excavated materials, the construction of the proposed substation, the movement of construction vehicles, loading and unloading of aggregates/materials and the movement of material around the site.

The following dust control measures will be put in place during construction and decommissioning works:

- The internal access roads will be constructed prior to the commencement of other major construction activities. These roads will be finished with high quality graded aggregate;
- A water bowser will be available to spray work areas and haul roads, especially during periods of excavations works coinciding with dry periods of weather, in order to suppress dust migration from the site;
- All loads which could cause a dust nuisance will be covered to minimise the potential for fugitive emissions during transport;
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- The access and egress of construction vehicles will be controlled to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits, which shall be reduced in periods of dry, windy weather;
- Wheel washing facilities will be provided at the two main entrance/exit points of the Proposed Development site.

Complaints Procedure

At the main site entrance, the contact details for the site will be available so that local residents are encouraged to contact the Contractor in the event of an off-site dust impact.

The contractor on site will need to be immediately informed of the incident so that fugitive dust complaints can be substantiated.

In all instances, a complaint will be logged by the environmental manager and each complaint will be assigned a discrete complaint number in the Environmental Log.

The environmental manager will maintain the complaints register and any complaints received will be investigated and the dust suppression methods employed will be reviewed. Suitable remedial action will be undertaken as necessary.

4.3.3 Noise and Vibration Management

The predicted noise levels from on-site activity from the Proposed Development is below the noise limits in BS 5228-1:2009+A1:2014. Nonetheless, several mitigation measures will be employed to minimise any potential impacts from the Proposed Development.

The noise impact for construction works traffic will be mitigated by generally restricting movements along access routes to the standard working hours and exclude Sundays and public holidays, unless specifically agreed otherwise. For example, during turbine erection, an extension to the working day may be required but this would be necessary only on a relatively small number of occasions. The hours of construction activity will be as described in Section 3.4.

It will be ensured that vehicles on local roads do not wait outside residential properties with their engines idling during turbine deliveries. Local residents and the local authority will be consulted in advance of any activities likely to occur outside of normal working hours. The transport of large transport loads generates low levels of noise and vibration as trucks performing such tasks move at very low speeds. Construction activity is temporary and unlikely to generate noise issues at any receptor. Construction noise including ground vibration, and air overpressure impacts are predicted as insignificant.

Consultation with the local community is important in minimising the impacts and therefore construction will be undertaken in consultation with the local authority as well as the residents being informed of construction activities through the Community Liaison Officer.

The construction works on site will be carried out in accordance with the guidance set out in BS 5228:2009+A1:2014. Proper maintenance of plant will be employed to minimise the noise produced by any site operations.

The on-site construction and decommissioning noise levels will be below the relevant noise limit of 65 dB LAeq,1hr for operations exceeding one month, and therefore construction noise impacts are not considered to be significant. However, there is potential for temporary elevated noise levels due to the grid connection works. However, the impact of these works at any particular receptor will be for a short duration (i.e. less than 3 days). Where the works at elevated noise levels are required over an extended period at a given location, a temporary barrier or screen will be used to reduce noise levels below the noise limit where required. The noise impact will also be minimised by limiting the number of plant items operating simultaneously where reasonably practicable.

The operation of plant and machinery, including site vehicles, is a source of potential impact that will require mitigation at all locations within the site. Proposed measures, which are the same as those proposed for the construction phase, to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All plant and equipment to be used on-site will be modern equipment and will comply with the S.I. No. 359/1996 - European Communities (Construction Plant and Equipment) (Permissible Noise Levels) (Amendment) Regulations.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- Compressors will be of the “sound reduced” 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 shall be fitted with suitable silencers.
- Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the Site Manager to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.
- Local areas of the haul route will be condition monitored and maintained, if necessary.

4.3.4 Biodiversity / Flora and Fauna Management

Objectives

The primary objectives of biodiversity / flora and fauna management are as follows:

- Promote the conservation of habitats on site through the establishment of management and/or mitigation;
- Provide management and mitigation for aquatic habitats and water quality;
- Provide management and mitigation for avifauna;
- Provide management and mitigation for bats and terrestrial mammals;
- Monitor the usage of the Site by birds post construction;
- Monitor for any collision by birds at the Site post construction;
- Monitor for any collision by bats at the Site post construction.

For mitigation measures associated with the protection of terrestrial ecology please refer to Section 9.14 of Chapter 9 Volume II of the EIAR.

For mitigation measures associated with the protection of aquatic ecology please refer to Section 9.14 of Chapter 9 Volume II of the EIAR

In addition to the above mitigation measures from the EIAR, the mitigation measures prescribed in the Natura Impact Statement (NIS) carried out for the Proposed Development will be implemented in full. For mitigation measures associated with the NIS please refer to Chapter 9, Volume II of the EIAR.

4.3.5 Archaeological Management Plan

Mitigation Measures and Monitoring

A suitably qualified archaeologist will be employed to oversee the construction phase of the Proposed Development and will advise on and establish appropriate Exclusion Zones around the external most elements of Heritage Assets. Exclusion zones shall be fenced off or demarcated for the duration of construction works in the vicinity of the monuments and will be agreed in advance with the National Monuments Service. No groundworks of any kind (including but not limited to advance geotechnical site investigations) and no machinery, storage of any materials or any other activity related to construction will be permitted within Exclusion Zones.

A systematic advance programme of archaeological field-walking surveys will be undertaken within all construction areas to confirm whether there are any surface traces of any potential unrecorded archaeological or architectural heritage sites exist within areas inaccessible due to the presence of thick tree cover. Archaeological monitoring of ground excavation works during the construction phase will then be carried out within all areas of the Site under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. The Archaeologist will advise on the need for geophysical survey in advance of ground excavation. In the event that any archaeological sites are identified during monitoring, ground works will halt at the location and the archaeological remains will be recorded and cordoned off. The NMS will then be consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through systematic archaeological excavations licensed by the NMS.

4.3.6 Waste Management Plan

It will be the objective of the Developer in conjunction with appointed contractor to prevent, reduce, reuse and recover as much of the waste generated on site as practicable and to ensure the appropriate transport and disposal of residual waste off site. This is in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended.

Any waste generated during the development construction phase will be collected, source separated and stored in dedicated receptacles at the temporary compound during construction pending removal to an appropriately licensed waste facility.

A Construction Waste Management Plan has been prepared for the Proposed Development in line with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects" (2021) as published by the Department of the Environment, Community and Local Government.

The Waste Management Plan will be finalised in accordance with this plan following the appointment of the contractor for the main construction works. This plan should be read in conjunction with the EIAR. The Construction Waste Management Plan will comply with the Statutory requirements of the National Waste Management Plan for a Circular Economy.

Assignment of Responsible Personnel

It will be the responsibility of the contractor for the main construction works (when appointed) to nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as Waste Manager who will have overall responsibility for the management of waste. The waste manager will have overall responsibility to instruct all site personnel including sub-contractors to comply with on-site requirements. They will ensure that at an operational level each crew foreman is assigned direct responsibility.

Waste Generated

It is envisaged that the following categories of waste will be generated during the construction of the Proposed Development:

- municipal solid waste (MSW) from the office and canteen;
- construction waste including concrete;
- waste oil/hydrocarbons;
- paper/cardboard;
- timber;
- steel.

A fully authorised waste management contractor will be appointed prior to construction works commencing. This contractor will provide appropriate receptacles for the collection of the various waste streams and will ensure the regular emptying/and or collection of these receptacles.

Waste Minimisation/Reduction

All efforts will be made by site management to minimise the creation of waste throughout the construction of the Proposed Development.

This will be done by:

- material ordering will be optimised to ensure only the necessary quantities of materials are delivered to site
- material storage areas will be of a suitable design and construction to adequately protect all sorted materials to ensure no unnecessary spoilage of materials occurs which would generate additional waste
- all plant will be serviced before arriving on site. This will reduce the risk of breakdown and the possible generation of waste oil/hydrocarbons on site
- all operators will be instructed in measures to cut back on the amount of wastage for trimming of materials etc. For example, cutting of plywood, built into the amount ordered
- educating foremen and others to cut/use materials such as ply wisely for shutters etc.
- prefabrication of design elements will be used where suitable to eliminate waste generation on site
- where materials such as concrete are being ordered, great care will be practiced in the calculation of quantities to reduce wastage.

Waste Reuse

When possible, materials shall be re used onsite for other suitable purposes e.g.

- re-use of shuttering etc. where it is safe to do so;
- re-use of rebar cut-offs where suitable;
- re-use of excavated soil for screening, berms etc.;
- re-use of excavated rock or stone – where possible will be used as suitable fill elsewhere on site for the new site tracks, the hardstanding areas and embankments where possible.

Waste Recycling & Recovery

In accordance with national waste policy, source separation of recyclable material will take place. Receptacles will be clearly labelled, signposted and stored in dedicated areas in the construction compound.

The following sourced segregated materials container will be made available on site in the construction compound:

- timber;
- ferrous metals;
- aluminium;
- dry mixed recyclables;
- packaging waste;
- food waste.

Typical waste quantities generated during construction of similar-sized developments are included hereunder with typical recovery / reuse that can be achieved.

		Reuse		Recycle/Recovery		Disposal	
Waste Type	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	1200	10	120	80	960	10	120
Timber/Wood	1000	40	400	55	550	5	50
Plasterboard	360	30	108	60	216	10	36
Metals	300	85	255	10	30	5	15
Concrete	200	20	40	65	130	15	30
Other	540	20	108	60	324	20	108
Total	3600		1031		2210		359

The materials will be transported off-site by a licensed contractor to a licensed recovery centre and these materials will be processed through various recovery operations. A list of nearby licensed waste management facilities is shown in Table 4-2.

Table 4-2 Nearby Waste Management Facilities

Licensed Waste Facility Location	Type of Waste
J. Ryan Haulage Ltd. Cushina, Portarlington, Co. Offaly (c. 3.4km from site)	Soil and stones
Pat Mangan, Ballycon Mount Lucas Daingean Co. Offaly (c. 16.4km from site)	Soil and stones
Killeshal Precast Concrete Ltd, Killeshal, Daingean, Co. Offaly R35 YK85 (c. 24km from site)	Concrete, soil and stones, mixed construction and demolition waste
T/A Oxigen Environmental Barnan, Daingean Co. Offaly R35 EE64 (c. 26km from site)	Waste plastics (except packaging), waste from forestry, waste metal, paper and cardboard packaging, plastic packaging, wooden packaging, metallic packaging, composite packaging, mixed packaging, glass packaging, textile packaging, concrete, bricks, tiles and ceramics, mixture of concrete, bricks, tiles and ceramics, wood, glass, plastic, copper, bronze, brass, aluminum,

Licensed Waste Facility Location	Type of Waste
	lead, zinc, iron and steel, tin, mixed metals, cables, soil and stones, insulation materials, gypsum-based construction materials, mixed construction and demolition wastes, paper and cardboard, ferrous metal, non-ferrous metal, plastic and rubber, glass, wood containing dangerous substances, wood, textiles, minerals (for example sand, stones), combustible waste (refuse derived fuel)
Anthony Cocoman, Shean Edenderry Co. Offaly (c. 17km from site)	Concrete, soil and stones
Hinch Plant Hire Ltd, Ballydownan Geashill Co. Offaly (c. 15.6km from site)	Soil and stones
John Mallen, Ballycon Mount Lucas Co. Offaly, (c. 15.1km from site)	Concrete, soil and stones, dredging spoil

Waste Disposal

Residual waste generated on-site will require disposal. This waste will be deposited in dedicated receptacles and collected by the licensed waste management contractor and transported to an appropriate facility. All waste movements will be recorded, which records will be held by the waste manager on-site.

Contaminated Material

Any contaminated soils will be handled, removed and disposed of in accordance with statutory requirements for the handling, transportation and disposal of waste. In particular, the following measures will be implemented:

- Contaminated material will be left in-situ and covered, where possible until such time as WAC (Waste Acceptance Criteria) testing is undertaken in accordance with recommended standards and in-line with the acceptance criteria at a suitably licenced landfill or treatment facility. This will determine firstly the nature of the contamination and secondly the materials classification i.e. inert, non-hazardous or hazardous,
- If the material is deemed to be contaminated, consultation will take place with the respective local authority and/or EPA on the most appropriate measures. Such materials will be excavated, transported by a contractor with a valid waste collection permit and recovered/disposed of at an appropriate facility.

Waste Management Training

Copies of the construction waste management plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities that fall upon them as a consequence of its provisions.

It will be the responsibility of the contractors appointed Waste Manager to ensure that all personnel are made aware of their responsibilities under the plan via a toolbox talk or otherwise.

4.4 Environmental Management Team - Structure and Responsibility

A preliminary organisation chart is included hereunder.

The Contractor's Project Manager will be responsible for the delivery of all elements of the Environmental Management Plan.

The Contractor's Project Manager will retain all responsibility for issuing, changing and monitoring the Environmental Management Plan throughout.

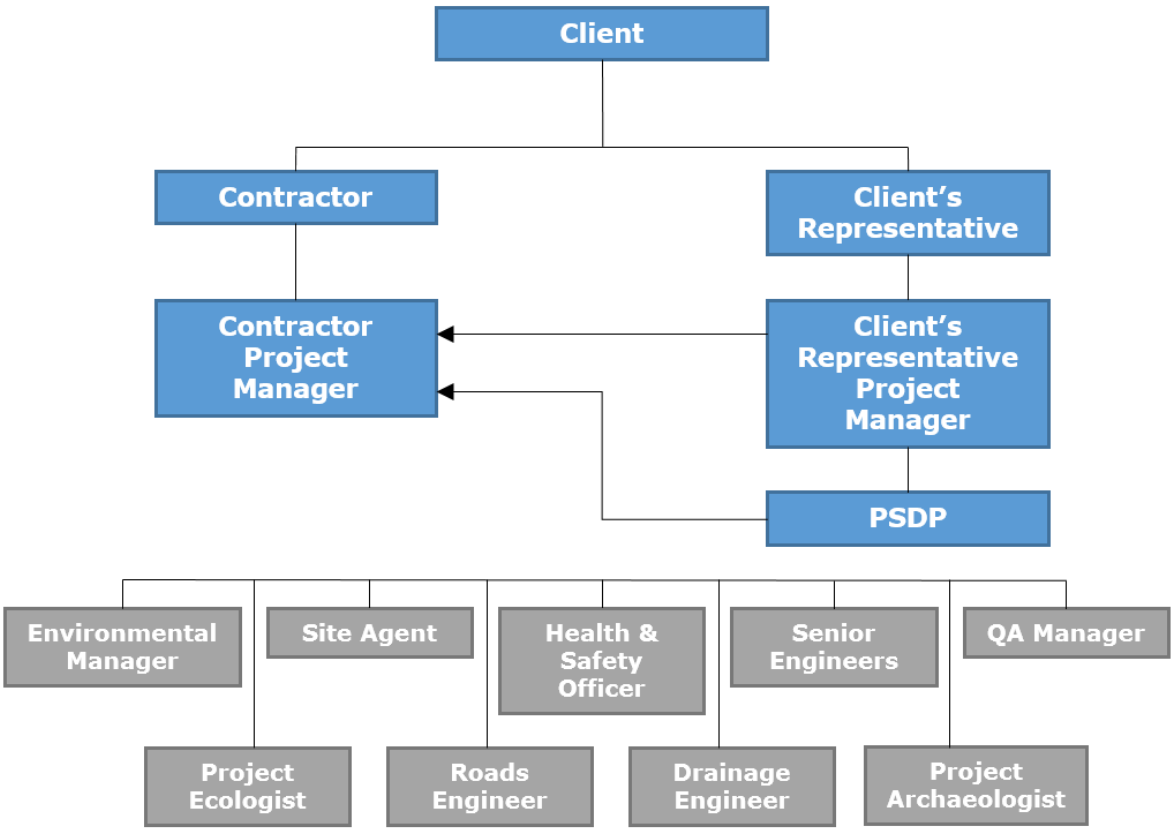

Figure 4-1: Project Management Team Organogram

4.5 Training, Awareness and Competence

All site personnel will receive environmental awareness information as part of their initial site briefing. The detail of the information will be tailored to the scope of their work on site.

The contractor for the main construction works will conduct the environmental awareness training at the same time as Health and Safety Training (often referred to as Site Inductions).

This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The CEMP will be available in the main site compound during the construction of the Proposed Development. The environmental performance at the site is on the agenda of the monthly project management meetings for the Proposed Development.

Elements of the CEMP will be discussed at these meetings including objectives and targets, the effectiveness of environmental procedures etc. Two-way communication will be encouraged by inviting all personnel to offer their comments on environmental performance at the site.

4.6 Environmental Policy

The contractor is responsible for preparing and maintaining an Environmental Policy for the site. The policy will be appropriate to the Proposed Development, commit to continuous improvement and compliance with legal requirements and provide a framework for objectives and targets. This will be communicated to all site personnel and will be available on-site notice boards.

4.7 Register of Environmental Aspects

The contractor is responsible for preparing and maintaining a Register of Environmental Aspects pertaining to the site. This register will identify the environmental aspects associated with activities onsite and determine which aspects have or can have a significant impact on the environment. This will be adopted from the mitigations set out in Chapter 9 of the EIAR.

4.8 Register of Legislation

The contractor is responsible for preparing and maintaining a register of key environmental legislation pertaining to the site. This register will reference all current environmental legislation and will be inspected, reviewed and updated regularly to ensure compliance.

4.9 Objectives and Targets

Objectives and targets will be set to ensure that the Proposed Development can be constructed and operated in full accordance with the EIAR, planning conditions and legislative requirements, with minimal impact on the environment.

Environmental objectives are the broad goals that the contractor must set in order to improve environmental performance. Environmental targets are set performance measurements (key performance indicators or KPI's) that must be met in order to realise a given objective.

4.10 Non-Conformance, Corrective and Preventative Action

Non-Conformance Notices will be issued where there is a situation where limits associated with activities on the Proposed Development are exceeded, or there is an internal/external complaint associated with environmental performance.

Non-Conformance is the situation where essential components of the EMS are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the EMS is compromised, in terms of the policy, objectives and management programmes. A Non-Conformance register will be controlled by the contractor.

The EMS and all its components will be required to conform to the EMP. In the event of non-conformance with any of the above, the following must be undertaken:

- Assess cause of the non-compliance;
- Develop a plan for correction of the non-compliance;
- Determine preventive measures and ensure they are effective;
- Verify the effectiveness of the correction of the non-compliance;
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility will be designated for the investigation, correction, mitigation and prevention of non-conformance.

4.11 EMS Documentation

The Contractor is required to keep the following documentation in relation to the environmental management of the construction of the Proposed Development (as a minimum):

- Construction Environmental Management Plan;
- Register of Environmental Impacts;
- Register of Planning Conditions;
- Monitoring Records;
- Minutes of Meetings;
- Training Records;
- Audit and Review Records.

All these documents and records will be available for inspection in the site office. The documentation will be kept up to date and will be reviewed on a regular basis with revisions controlled in accordance with the site quality plan.

4.12 Control of Documents

The Contractor will establish, implement and maintain a procedure to control CEMP documents and records so they are clearly identifiable, organised, current, easily located and revised when necessary.

5. SAFETY & HEALTH MANAGEMENT PLAN

5.1 Introduction

This Safety and Health Management Plan (SHMP) defines the work practices, procedures and management responsibilities relating to the management of health and safety during the design, construction and operation of the Proposed Development and will be read in conjunction with the Preliminary Safety & Health Plan prepared for the Proposed Development by the Project Supervisor for the Design Process. The Safety and Health Management Plan for the construction stage will be finalised in accordance with this plan following the appointment of the contractor for the main construction works.

This SHMP describes how the contractor for the main construction works will implement a site safety management system (SMS) on this project to meet the specified contractual, regulatory and statutory requirements, environmental impact assessment report and natura impact statement mitigation measures and planning conditions The contractor will be required to implement an effective safety management system and will be required to appoint a health and safety officer to ensure that the developer's safety requirements for the construction of this Proposed Development are met.

All site personnel will be required to be familiar with the requirements of the safety management plan as related to their role on site. The plan describes the project organisation and sets out the health and safety procedures that will be adopted on site.

- The Safety and Health Plan is a controlled document and will be reviewed and revised as necessary.
- A copy of the Safety and Health Plan will be located on/near the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of the SHMP and its contents.

5.2 Project Obligations

The construction of the Proposed Development will impose numerous safety management obligations on the developer, designer and contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR for the Proposed Development. These obligations are set out below. The contractor for the main construction works and all its sub-contractors are to ensure that they are fully aware of and in compliance with these safety obligations.

5.2.1 Planning Permission Obligations

Planning permission obligations will be fully outlined in this CEMP once it is updated if planning permission is granted.

5.2.2 Statutory Obligations

The Safety, Health and Welfare at Work Act 2005 (as amended) and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) place a responsibility on the Developer as the "Client", the Designer, the Project Supervisors and the Contractor.

The Client will:

- Appoint a competent and adequately resourced Project Supervisor for the Design Phase (PSDP);
- Appoint a competent and adequately resourced Supervisor for the Construction Stage (PSCS);
- Be satisfied that each designer and contractor appointed has adequate training, knowledge, experience and resources for the work to be performed;
- Co-operate with the project supervisor and supply necessary information;
- Keep and make available the safety file for the completed structure;
- Provide a copy of the safety and health plan prepared by the PSDP to every person tendering for the project;
- Notify the Authority of the appointment of the PSDP.

Designers must:

- Identify any hazards that their design may present during construction and subsequent maintenance;
- Eliminate the hazards or reduce the risk;
- Communicate necessary control measures, design assumptions or remaining risks to the PSDP so they can be dealt with in the safety and health plan;
- Co-operate with other designers and the PSDP or PSCP;
- Take account of any existing safety and health plan or safety file
- Comply with directions issued by the PSDP or PSCS.

The PSDP must:

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the Proposed Development;
- Where possible, eliminate the hazards or reduce the risks;
- Communicate necessary control measure, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan;
- Ensure that the work of designers is coordinated to ensure safety;
- Organise co-operation between designers;
- Prepare a written safety and health plan for the Proposed Development and deliver it to the client prior to tender;
- Prepare a safety file for the completed structure and give it to the client.

The PSCS must:

- Co-ordinate the identification of hazards, the elimination of the hazards or the reduction of risks during construction;
- Develop the Safety and Health Plan initially prepared by the PSDP before construction commences;
- Co-ordinate the implementation of the construction regulations by contractors;
- Organise cooperation between contractors and the provision of information;
- Co-ordinate the reporting of accidents to the Authority;
- Notify the Authority before construction commences;
- Provide information to the site safety representative;

- Co-ordinate the checking of safe working procedures;
- Co-ordinate measures to restrict entry on to the site;
- Co-ordinate the provision and maintenance of welfare facilities;
- Co-ordinate arrangements to ensure that craft, general construction workers and security workers have a Safety Awareness card, e.g. Safe Pass and a Construction Skills card where required;
- Co-ordinate the appointment of a site safety representative where there are more than 20 persons on site;
- Appoint a safety adviser where there are more than 100 on site;
- Provide all necessary safety file information to the PSDP;
- Monitor the compliance of contractors and others and take corrective action where necessary;
- Notify the Authority and the client of non-compliance with any written directions issued.

The Contractor must:

- Co-operate with the PSCS;
- Promptly provide the PSCS with information required for the safety file;
- Comply with directions of the project supervisors;
- Report accidents to the Authority and to the PSCS where an employee cannot perform their normal work for more than 3 days;
- Comply with site rules and the safety and health plan and ensure that your employees comply;
- Identify hazards, eliminate the hazards or reduce risks during construction;
- Facilitate the site safety representative;
- Ensure that relevant workers have a safety awareness card and a construction skills card where required;
- Provide workers with site specific induction;
- Appoint a safety officer where there are more than 20 on site or 30 employed;
- Consult workers with site specific induction;
- Monitor compliance and take corrective action.

Consequently, at all stages of construction of the Proposed Development there are statutory requirements for the management of safety, health and welfare of all involved in or affected by the development. This CEMP and specifically the Safety and Health Management Plan address key construction management issues associated with the construction of the Proposed Development. This plan will be developed further at the construction stage, on the appointment of the Contractor for the main construction works.

5.2.3 The Preliminary Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) a Preliminary Safety & Health Plan will be required as part of the design process. This plan will be further developed by the PSCS on appointment and maintained as a live document during construction and commissioning of the Proposed Development.

The safety and health plan will include the following information:

- a general description of the Proposed Development;
- details of other work activities taking place on site;
- works involving particular risks;

- the timescale for the construction phase and the basis on which the time frame was established;
- conclusions drawn by designers and the PSDP having taken into account the General Principles of Prevention and any relevant Safety and Health Plan or Safety File;
- the location of electricity water and sewage connections so as to facilitate early establishment of welfare facilities.

In accordance with the PSDP's procedures the Preliminary Safety & Health Plan for the Proposed Development will include the following sections and subsections to ensure the PSCS is aware of the health and safety issues at tender stage and enable them to price accordingly:

Preamble:

1 General Project Information:
- 1.1 Title;
- 1.2 Description of the Proposed Development;
- 1.3 Employer;
- 1.4 Designers / Other Consultants;
- 1.5 Project Supervisor Design Process;
- 1.6 Drawings, Specifications and Other Documents;
- 1.7 Intended Contract Commencement Date;
- 1.8 Intended Contract Completion Date;
- 1.9 Basis for Contract Duration;
- 1.10 Restrictions on Working Hours;
- 1.11 Notification of Project;
- 1.12 Termination of the PSCS Appointment.

2 The Existing Environment:
- 2.1 Site Location;
- 2.2 Relevant Adjoining Land Uses;
- 2.3 Site Restrictions;
- 2.4 Restrictions on Access;
- 2.5 Hazardous Area Classification;
- 2.6 Existing Services;
- 2.7 Ground Conditions;
- 2.8 Existing Hazards;
- 2.9 Liaison with Statutory Bodies.

3 Other Work Activities:
- 3.1 Other Contracts Which May Affect Work;
- 3.2 Occupation of Site;
- 3.3 Building Activities;
- 3.4 Other Work Activities;
- 3.5 Emergency Procedures in Place on Site.

4 Particular and Residual Risks:
- 4.1 Works Which Put Persons at Work at risk;

4.2 Work Which Puts Persons at Risk from Chemical or Biological Substances;
4.3 Work with Ionising Radiation;
4.4 Work near High Voltage Power Lines;
4.5 Work Exposing Persons at Work to the Risk of Drowning;
4.6 Work on Wells, Underground Earthworks and Tunnels;
4.7 Work Carried Out by Divers at Work Having a System of Air Supply;
4.8 Work Carried Out by Divers at Work Having a System of Air Supply;
4.8 Work Carried Out in a Caisson with a Compressed Air Atmosphere;
4.10 Work Involving the Assembly or Dismantling of Heavy Prefabricated Components;
4.11 Work Involving Hazardous Material;
4.12 Residual Risks.

5 Additional Information:
5.1 Existing Documents;
5.2 Site Possession;
5.3 Site Rules;
5.4 Site Specific Safety Objectives;
5.5 Phasing of Works;
5.6 Permits / Authorisation Required;
5.7 Maintenance;
5.8 Continuing Liaison;
5.9 Specific Recommendations.

6 Information Required for Safety File:
6.1 Information Required for Safety File from PSCS.

5.2.4 The Management of Health and Safety during the Construction Phase

The selection criteria for the Contractor for the works will be based on the ability to construct the works in a manner that will not endanger the safety, health and welfare of any parties and competence to fulfil the role of PSCS.

The contract will be awarded on the basis of assessment of the candidates against relevant health and safety criteria including experience of similar projects, knowledge of the construction processes involved and training of their management and staff who will be involved in carrying out the works.

5.2.5 The Construction Stage Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) the preliminary Safety & Health Plan prepared by the PSDP will be further developed by the PSCS before the commencement of the construction work and updated on a regular basis during the construction phase of the project.

The document will include the following sections and subsections to ensure the management of health and safety during the construction phase of the project:

1. Description of Project:

- project description and programme details;

- details of client, PSDP and PSCS, designers;
- main contractor and other consultants;
- extent and location of existing records and plans;
- arrangements for communicating with Contractors, PSDP and others as appropriate.

2. Communication and Management of the Work:

- management structure and responsibilities;
- safety and health goals for the construction phase and arrangements for monitoring and review of safety and health performance.
- arrangements for:
- regular liaison between parties on site;
- consultation with the workforce;
- the exchange of design information between the Client, Designers, Project Supervisor for the Design Process, Project Supervisor Construction Stage and Contractors on site;
- handling design changes during the construction phase;
- the selection and control of contractors;
- the exchange of safety and health information between contractors;
- security, site induction, and on-site training;
- welfare facilities and first aid;
- the production and approval of risk assessments and method statements;
- the reporting and investigation of accidents and other incidents (including near misses);
- site rules;
- fire and emergency procedures.

3. Arrangements for Controlling Significant Site Risks:

- safety risks:
- services, including temporary electrical installations;
- preventing falls;
- work with or near fragile materials;
- control of lifting operations;
- dealing with services (water, electricity and gas);
- the maintenance of plant and equipment;
- poor ground conditions;
- traffic routes and segregation of vehicles and pedestrians;
- storage of hazardous materials;
- dealing with existing unstable structures;
- accommodating adjacent land use;
- other significant safety risks.
- Health risks:
- removal of asbestos;
- dealing with contaminated land;
- manual handling;

- use of hazardous substances;
- reducing noise and vibration;
- other significant health risks.

The construction stage safety and health plan will be maintained on site by the PSCS and will be communicated to all relevant parties on an ongoing basis through inductions, site safety meetings and toolbox talks etc. as required.

6. EMERGENCY RESPONSE PLAN

6.1 Introduction

This chapter of the CEMP presents an Emergency Response Plan (ERP) for the proposed project. The Emergency Response Plan shall be finalised in accordance with this plan following the appointment of the contractor for the main construction works and following detailed design development.

This ERP contains predetermined guidelines and procedures to ensure the safety, health and welfare of everybody involved in the Proposed Development and to protect the environment during the construction phase of the Proposed Development. This outlines the immediate response to an emergency situation and will be developed by the main construction works contractor and PSCS as part of their construction stage Safety and Health Plan.

An emergency is any disruptive or harmful event that endangers people, environment, property or assets. Emergencies can be small, as in a fire contained by employees using firefighting equipment or large, as in damage resulting from a storm.

In the context of the Proposed Development, examples of Emergency Response Plan emergency events are:

- medical emergency;
- explosion;
- overheated equipment;
- chemical and fuel spill;
- fire;
- loss of power;
- vehicle incidents;
- land slippage.

Example sources of emergency or disaster events are:

- unstable/inappropriate stockpiles on site;
- faulty or incorrect use of equipment;
- falls from height;
- storm/adverse weather;
- power failure;
- fuel spill;
- road failure;
- serious vehicle collisions or overturning.

The emergency response plan deals with the immediate physical effects of a disaster and outlines the initial response.

6.2 Emergency Response Liaison

The contractor/PSCS will designate an individual to serve as the Emergency Response Liaison for this Proposed Development. The emergency response liaison will coordinate the emergency response for the duration of any emergency at or nearby the Site.

The local authority, An Garda Síochána and the HSE Ambulance Co-ordinator will be provided with the construction programme and the onsite contact information from the Emergency Response Liaison prior to construction.

The Emergency Response Liaison will be immediately reachable at all times during Proposed Development construction. The Liaison will coordinate with the above agencies to establish emergency procedures for access to and within the site in the event of an emergency.

6.3 Reporting Emergencies

In the event of fire, storm, flood, serious injury or other emergency, contact:

ALL ON SITE EMERGENCIES DIAL 999

6.4 Designated Responder

A map depicting turbine tower locations with the emergency meeting point will be furnished to the local authority, Fire Department and HSE ambulance co-ordinators.

Upon arrival on the scene, the senior EMS Officer will set up the incident command structure. The Emergency Response Liaison and all contractor's personnel will cooperate with directions of the incident commander and assist as directed.

The nearest emergency services, ambulance and Accident & Emergency (A&E) facilities are:

Service:	Contact Details:	
Accident & Emergency (A&E)	Midland Regional Hospital Portlaoise	(057) 869 6035
Ambulance Service	Dial 112 or 999	
Fire Services	Dial 112 or 999	
Garda Station	Newbridge Garda Station	(045) 431 212
District HQ:	Kildare Garda Station	+353 45 527737
Divisional HQ:	Naas Garda Station	+353 45 884311

Each member of the contractor's site team who are First-Aid and Cardiopulmonary Resuscitation (CPR) trained personnel will be identifiable with a hard hat sticker indicating their training.

6.5 Emergency Alarm

The emergency alarm will be raised on site as soon as an emergency situation is detected, the alarm will be identified (contractor to check those that apply):

	Air Horn		Radio		Voice		Hand Signals		Siren

6.6 Emergency Reporting

In the event of an emergency the nearest supervisor with radio equipment/mobile phone will be notified. The degree of emergency will be reported to the Emergency Response Liaison who will contact the Emergency Services and request the appropriate emergency service.

6.7 Medical Protocol

In the event of a major medical emergency, the emergency centre (999) will be notified, and an ambulance and emergency medical team will respond to the scene. All major medical cases require professional (ambulance) transportation. In the event of a minor medical case, the affected employee can be transported via company vehicle in the escort of a foreman or site engineer (with first aid training).

6.8 Emergency Response

Upon notification, the Emergency Response Liaison will respond to the emergency scene and manage emergency operations:

1. Assess hazards and make the area safe – If you cannot enter the area without risking your safety, don't do it, call the Emergency Services immediately and wait for them. If you think you can safely enter the area, look around the emergency scene for anything that can be dangerous or hazardous to you, the casualty, or anyone else at the scene. Bystanders can help with making the area safe. First aid kits will be available on site. Operators that have been first aid/CPR/AED trained will be listed on site and easily identifiable by a hard hat sticker.

2. Take charge of the situation – if you are the first-aid provider on the scene act fast. If someone is already in charge, briefly introduce yourself and see if that person needs any help. If there is any chance the casualty could have a head or spinal injury, tell them not to move.

3. Get Consent – always identify yourself as a first-aid provider and offer to help. Always ask for consent before touching a conscious adult casualty. Remember to protect yourself first by wearing gloves and eye protection.

4. Assess Responsiveness – is the casualty conscious or unconscious? Note their response while you are asking them for their consent. If they respond, continue with the primary survey, and if they don't respond, be aware that an unconscious casualty is or has the potential of being a breathing emergency.

5. Call out for help – this will attract bystanders. Help is always useful in an emergency situation. Someone can be called over to phone for medical help. Others can bring blankets if needed, get water, etc. a bystander can help with any of the following:

- Make the area safe.
- Find all the casualties.
- Find the first aid kit, or any useful medical supplies.
- Control the crowd.
- Call for medical help.
- Help give first aid, under your direction.
- Gather and protect the casualty's belongings.
- Take notes, gather information, be a witness.
- Reassure the casualty's relatives.
- Lead the ambulance attendants to the scene of the emergency.
- Notify Emergency Services as soon as you can. Either send a bystander or call yourself.

In the event of a major medical emergency the Emergency Response Liaison, as the person-in-charge of the emergency scene, will dispatch someone to the site access point nearest the emergency scene to direct and lead arriving outside responders to the emergency scene. The designated meeting point will be agreed prior to the commencement of construction. Emergency personnel will be met at this meeting point communicated by management during the 999 call. The emergency personnel escort will use the hazard lights on their vehicle, so they are easily identified.

6.9 Escape and Evacuation Procedure

Dependent upon the degree of the emergency and if safe to do so, employees will evacuate to the designated assembly area where the designated wardens shall account for all employees and determine if anyone still remains within the emergency scene.

Should a wild land fire or peat slippage occur, and the designated assembly area is compromised other locations will be designated as secondary assembly areas.

Wind turbines shall be fitted with fire suppression systems and will have emergency escape procedures in place for staff in the event of fire in a wind turbine.

6.10 Turbine Tower rescue Procedure

In the event personnel are trapped or injured in an elevated turbine tower position the following protocol will be initiated:

1. The Emergency protocol will be initiated.
2. Emergency Response Liaison will be notified.
3. Tower Rescue Team will be activated and respond to the scene.
4. Outside medical and Rescue Teams will be notified and respond to the scene.

Tower Rescue Procedure:

1. Upon learning of an emergency, the on-scene foreman shall assess the emergency and ascertain its degree, location and the extent of any injuries.
2. Upon confirming that an emergency exists the on-scene foreman notifies the Emergency Response Liaison and the project Office.
3. Upon notification of the emergency the Emergency Response Liaison shall notify senior project supervision and the local emergency centre (999) of the emergency.
4. The Emergency Response Liaison shall inform the dispatcher of the location, tower number, the degree of the emergency and the extent of injuries.

6.11 Prevention of Illness/Injury Due to Weather/Elements

1. All employees will have access to shelter and heat in the event of inclement weather.
2. Employees will have access to at least a litre of water at all times.
3. High wind warnings and weather forecast will be discussed every morning with the crews. Weather conditions and forecast will be monitored regularly by management.
4. No Employee will work alone. A buddy system will be used so employees can contact a supervisor in case of an emergency.

6.12 Environmental Emergency Procedure - Pollution Control

An emergency preparedness and response procedure is required to prevent environmental pollution incidents. Emergency Silt Control and Spillage Response Procedures are included in Section 4.7 of the Surface Water Management Plan which is included in Volume II Appendix 12.2 of this EIAR.

Suitable spill kits and absorbent material for dealing with oil spills will be maintained on site and will be provided in all construction vehicles. In the event of pollution or potential risk of pollution the Local Authority will be informed immediately.

In the case of water pollution in addition to the Local Authority, Inland Fisheries Ireland will also be informed immediately.

6.13 Emergency Response Plan - Haul Routes

Emergency Response Procedure relating to transportation of plant, equipment and materials to site will be developed by the main contractor during the construction phase of the Proposed Development.

6.14 Emergency Response Plan - Fire

A site evacuation/fire drill procedure will be in place for carrying out the immediate evacuation of all site personnel in the event of an emergency with might include fire on site or within adjacent lands. The following steps will be taken:

- Notification of the emergency situation. Provision of a siren to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide the next course of action, which be determined by the situation that exists at that time and will advise all personnel accordingly.
- All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

Fire Safety awareness will be provided as part of general safety induction to the Site. Specific fire training provided to all relevant fire wardens/ officers /representatives. Fire officers will ensure that used or partially used Fire Extinguishers are immediately refilled or replaced.

Smoking will be restricted on site to designated areas within the construction compounds only.

Stockpiling of cleared vegetation / brash will not take place during periods of high fire risk.

Machinery will be parked in a manner that allows them to be moved in an emergency and will be parked a reasonable distance apart from each other to avoid the risk of a fire spreading to adjacent machines.

Areas must be left safe from the threat of fire following hot works. Hot work will only be undertaken by competent and trained personnel under a permit to work system and a fire risk assessment carried will be out for all hot works.

6.15 Emergency Events - Wind Turbine Damage/Failures

Each wind turbine, incorporating the tower, blades, gearbox and ancillary equipment in the tower and nacelle is a machine under the European Machinery Directive [2006/42/EC]. The duties of designers and manufacturers of machinery are set out in the Machinery Directive, which has been transposed into national law by the 2008 European Communities (Machinery) Regulations [S.I.No.407/2008] (as amended). All wind turbines will be CE marked, which is in effect, a mark of assurance that the wind turbine complies with the essential health and safety requirements (EHSRs) of EU supply law. In all cases, the manufacturer or the manufacturer's authorised representative will compile information in a technical file confirming how the machine complies with these requirements. The commissioning of turbines and ancillaries will only be carried out by competent, trained and qualified personnel. The system of work for commissioning must be planned, organised, maintained and revised to ensure safety of personnel.

Potential emergency events associated with wind turbines include:

- Blade loss;
- Fire;
- Wind turbine toppling (due to foundation or tower failure);
- Wind turbine rotational failure in extreme wind conditions (due to control system or rotor break failure).

The primary mitigation against an emergency catastrophic event that may endanger the health and safety of the public is implemented at design stage through adequate siting of wind turbines which provide sufficient set back distances from occupied buildings and other infrastructure to avoid the risk of impact in the event of wind turbine collapse.

Peat slippage contingency measures have been included in Section 6.16 below in the unlikely event of landslide scenario.

6.16 Land Slippage Contingency Measures

6.16.1 Excessive Movement

Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

1. All activities (if any) shall cease within the affected area.
2. Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
3. Re-commencement of activities shall only start following a cessation of movement and a review by an experienced geotechnical engineer.

6.16.2 Onset of Peat Slide

In the unlikely event where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following will be carried out.

1. On alert of a peat slide incident, all activities (if any) in the area will cease and all available resources will be diverted to assist in the required mitigation procedures.
2. Action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain and the inability to predict locations it may not be possible to implement any on-land prevention measures, in this case a watercourse check barrage will be implemented.
3. All relevant authorities will be notified if a peat slide event occurs on site.
4. For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by an experienced geotechnical engineer and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

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APPENDIX 2.1B

Grid Connection Construction Methodology

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APPENDIX 2.1C

Derrylea Road Arborist Report for Grid cable works

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