



TOBIN

**Ballincor Wind Farm,
Volume 3**

**Appendix 2-3 Construction
Environmental Management
Plan (CEMP)**

BUILT ON KNOWLEDGE

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1. INTRODUCTION

RWE Renewables Ireland Limited (hereafter 'RWE'), intend to apply to An Coimisiún Pleanála for planning permission to construct the proposed Ballincor Wind Farm in County Offaly (which along with all of the associated infrastructure and works is hereafter referred to as the proposed project). The proposed wind farm site is situated at the border of County Tipperary and Offaly, 5 km south of Birr and 3.6 km north of Shinrone. The Little Brosna River delineates the eastern boundary of the site.

The proposed project is expected to have an Export Capacity (EC) of between 61.6 to 77 MW with the erection of 11 no. wind turbines. The proposed project comprises a wind farm of 11 no. wind turbines and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, 110 kV grid connection and works along the road network for turbine/material delivery.

A full description of the proposed project is provided in Chapter 2 (Description of the Proposed Project). A full set of planning drawings are available as part of the planning application for the proposed project.

1.1 SITE LOCATION

The overall proposed project is shown on Figure 1-1 of the EIAR (See Chapter 1). The wind farm site encompasses approximately 355 ha, primarily consisting of agricultural land, forestry, and peatland.

The proposed wind farm site is situated west of the Little Brosna River, with elevations ranging from 45 to 65 meters above ordnance datum (OD). The surrounding landscape is predominantly low-lying, except for Knockshigowna Hill to the southwest. To the east of the Little Brosna River lies the Sharavogue Bog Special Area of Conservation (SAC), which is characterised by peatland habitats.

The site predominantly comprises cutover bog, tillage, grassland, mixed broadleaved woodland, oak-birch-holly woodland, bog woodland, and scrub. The surrounding area has a relatively high density of individual residential developments. The N62 is located approximately 3 km to the east, and the site has good access via the local road network. The proposed wind farm site is situated on lands owned by local landowners, who have consented to the planning application. The primary construction site entrance is located approximately 2.5km to the South-East of the Sharavogue N62 and R492. Access to the site will be at this location along the R492.

The GCR spans approximately 12.23 km, running north from the proposed Ballincor Wind Farm 110 kV Substation in County Tipperary to the existing ESB Dallow 110 kV Substation in County Offaly. The route begins on private land before joining the L-1071 public road for 4.7 km, then merges onto the N-52 near Riverstown Village, where horizontal directional drilling (HDD) is used to avoid NIAH protected bridge (Bridge 1) (TN-N52-088-00) which was built to cross over the disused Parsonstown (Birr) to Portumna Bridge railway line. After a short stretch on the N-52, the GCR turns northwest onto the R489, then north on the L-5045, and east on the L-1077. It crosses the Little Brosna River using HDD within private land, continues along local roads to the R-439, and finally transitions to private land near the L-70152 junction before reaching the Dallow Substation. The methodology includes a combination of HDD and standard open trenching, primarily within the public road network.



It is proposed that turbine components will be delivered to the site via Foynes Port, Co. Limerick. The route heads west along the N69, where it will join the N18 on the outskirts of Limerick. The route continues onto the M7 and depart the M7 at Junction 21 near Derrinsallagh and join the northbound R435 towards Kyle Manor. At Kyle Manor loads will turn left and join the R445. the route will continue west along the R445 to the Dublin Road Roundabout where loads will turn right and then left to travel west towards Roscrea. The route continues along the Dublin Road onto the N62 travelling northwest through Roscrea. It continues north-westerly on the N62 to Sharavogue where it turns left onto the R492 and continues southwest to the proposed wind farm site entrance.

Further information on the proposed site is provided in Chapter 2 (Description of the Proposed Project) of this EIAR.

1.2 BRIEF PROJECT DESCRIPTION

RWE Renewables Ireland Ltd. proposes to develop the proposed project in County Tipperary and County Offaly, located 5 km south of Birr and 3.6 km north of Shinrone.

A summary of the proposed project is as follows:

- Assembly of 11 Wind Turbine Generators (including tower sections, nacelle, hub, rotor blades) with an estimated capacity of 61.6 to 77 MW and a blade tip height between 179.5 and 180 m, rotor diameter between 149 to 163 m, hub height of between 98.5 and 105 m metres.
- Associated hardstanding and turbine foundations at each turbine location;
- Upgrading of existing access tracks, construction of new founded access roads and floating roads within the proposed wind farm. Total length of internal access roads is 9.7 km, and upgrades of two site entrances on R492 and L1071;
- Erection of 104 m permanent meteorological mast and including lightening pole;
- All associated excavation, earthworks and spoil management, Surface water drainage system and sediment control; Installation of new clear span watercourse or drain crossings on proposed wind farm site; Excavation and restoration of three borrow pits (borrow pit 1 to borrow pit 3) and one peat deposition area;
- Wheel wash, security fencing & hut;
- Four Temporary construction compounds including site office and staff facilities;
- Installation of 33 kV medium voltage electrical and communication cabling underground between the proposed turbines and the proposed on-site substation and associated ancillary works; All electrical plant and infrastructure and grid ancillary services equipment;
- 110 kV electricity on-site substation and switch rooms; including one EirGrid control building containing welfare facilities and storeroom, wastewater and rainwater holding tank;
- One Independent Power Producer (IPP) control building containing HV switch room, site offices, welfare facilities, wastewater holding tank;
- One Battery energy storage system (BESS) control building containing worker welfare facilities and equipment store, wastewater holding tank; 90 BESS container units, inverters, underground water storage tank and associated works;



- Works along the public road and private land for a 12.23 km grid connection to the existing Dallow 110 kV substation including installation of 17 joint bays along the grid connection route ("GCR") which runs across the townlands of Cronekill, Castletown, Clondallow, Birr, Kilenamuck, Tinnakilly, Ballyloughnane, Killeen, Croghan, in Co. Offaly and Townparks, Dovegrove, Woodfield or Tullynisk, and Ross in Co. Tipperary;
- Upgrading of existing access tracks, construction of new founded access roads and floating roads within the proposed wind farm and a founded road for the GCR at Clondallow, Birr, Co. Offaly;
- Electrical and communication cables, linking the turbines to the proposed grid connection point;
- Turbine Delivery Accommodation works, road surfacing works, temporary wall/vegetation removal, load bearing surface will be laid to provide a minimum 4.5 m running width and a 5.5 m clearance width for turbine delivery at Sharavogue crossroads, Sharavogue, Co. Offaly.
- All associated infrastructure and services including site works and temporary construction signage,
- Operational stage site signage;
- All related site works and ancillary development including berms, landscaping, and soil excavation;
- Tree felling (7.2 ha) and hedgerow removal (1.1 km) to facilitate construction and operation of the proposed project,
- Biodiversity enhancement including hedgerow replanting (1.3 km), peatland enhancement, tree planting.

An overview of the proposed project is shown in Drawing No. 11333-2005. A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought for the proposed project and does not include elements of the overall proposed project, such as works required within the public road corridor to accommodate the proposed turbine delivery route (TDR). These TDR works to proposed wind farm include hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening. For these locations, works associated with road infrastructure have been identified and assessed in the EIAR, however, permission for these works will be sought separately.

A permanent planning permission is being sought for the proposed grid connection (GCR) and substation as these will remain as a permanent part of the national infrastructure, which will be operated by the Transmission System Operator, EirGrid and owned by ESB the Transmission System Owner and will remain in place upon decommissioning of the wind farm.

1.3 CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

This CEMP has been prepared to present the proposed management and administration of site activities for the construction phase of the proposed project, to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments related to the construction of the project, and the measures to



ensure compliance with legislation and the requirements of statutory bodies, all as detailed in the project EIAR and Natura Impact Statement (NIS).

The CEMP provides a summary of the requirements from relevant guidance, standards, and codes of practice applicable to the work being undertaken as part of the proposed project. The following is a non-exhaustive list of relevant guidance/standards/codes referenced in the preparation of this CEMP:

- Environmental Protection Agency (EPA), Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022);
- Department of Housing, Planning and Local Government (DHPLG), Draft Revised Wind Energy Development Guidelines (December 2019);
- Department of Environment, Heritage and Local Government (DEHLG), Wind Energy Development Guidelines (December 2006);
- EPA Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects (November 2021);
- Inland Fisheries Ireland (IFI) Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016);
- Construction Industry Research and Information Association (CIRIA) C532 publication 'Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors' (CIRIA, 2001);
- CIRIA C648 publication 'Control of water pollution from linear construction projects' (CIRIA, 2006);
- CIRIA C741 publication 'Environmental Good Practice on Site' (4th Edition) (CIRIA, 2015);
- CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016);
- CIRIA C697 & C753F publications 'SuDS Manual' (CIRIA, 2007 & 2015);
- CIRIA 811 (2023) Environmental good practice on site guide (fifth edition)
- National Roads Authority (NRA) (2008). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. National Roads Authority;
- Irish Working Group on Groundwater (2005) Guidance Document GW5, Groundwater Working Group (WGGW) 2005;
- British Standards Institution (BSI), BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise;
- BSI, BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels);
- Scottish Natural Heritage (SNH) (2019) 'Good Practice during Wind Farm Construction' (4th edition). Scottish Natural Heritage;
- The Institute of Air Quality Management (IAQM) publication '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014);
- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes published by the NRA (now TII) in 2011;
- The Control of Dust and Emissions during Construction and Demolition published by the Greater London Authority (GLA) in 2014;



- Eastern Regional Fisheries Board (2004) guidance document “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites”.

1.4 OBJECTIVES OF THIS CEMP

The objectives of the CEMP are to:

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

1.5 IMPLEMENTATION AND CONTROL OF THE CEMP

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

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

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

1.6 REVISIONS TO THE CEMP

The CEMP is considered a ‘live’ document and as such will be reviewed on a regular basis to allow any changes to construction programme, operations or unforeseen issues be incorporated at any stage throughout the project as deemed necessary by the Applicant, their agents or relevant authorities. The CEMP will be subject to continual review to address, for example:

- Any conditions stipulated in the planning approval;



- Any requirements/issues highlighted through consultations prior to works e.g. by the National Parks and Wildlife Service (NPWS), Offaly and Tipperary County Council etc.;
- To ensure it reflects best practice at the time of construction; and
- To ensure it incorporates the findings of any pre-construction site investigations.

This CEMP will be provided to the appointed Main Contractor who will have responsibility for updating the document as necessary through the construction phase.

The Contractor's CEMP will incorporate the conditions associated with any grant of planning for the proposed project. This CEMP will be subject to ongoing review (throughout the construction phase of the proposed project), through regular environmental auditing and site inspections. This will confirm the efficacy and implementation of all relevant mitigation measures and commitments identified in the application documentation.

The appointed Contractor is required to include further details and/or confirmation in the updated version of the CEMP which will include:

- Details of emergency plan including personnel and contact numbers;
- Site and traffic signage; and
- Method statements.

The appointed Contractor shall also agree and implement monitoring measures to monitor the effectiveness of the CEMP.

1.7 ENVIRONMENTAL AWARENESS AND CONTROL

In order to ensure that environmental awareness and compliance is communicated effectively at the start and throughout the construction works, this CEMP and its contents will be communicated to all site personnel, including management staff, operatives and sub-contractors. The key elements of this CEMP will form part of the site induction which will be mandatory for all employees, Contractors and visitors attending the site. Environmental toolbox talks will be provided to all site personnel and sub-consultants on a regular basis. These will be targeted at particularly sensitive environmental issues such as:

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

1.8 EMERGENCY RESPONSE PLAN (ERP)

The Contractor will be responsible for developing a detailed environmental Emergency Response Plan (ERP) for the proposed works, to cover environmental emergencies, as part of the Health & Safety Plan. Details related to the ERP are outlined in Section 6 of this CEMP.

Further information relating to the management of spills or leaks and the procedure for responding to an environmental incident is outlined in Section 6 of this CEMP.



1.9 INCIDENTS AND COMPLAINTS

Details related to the incidents / complaints are outlined in Section 5.2.4 of this CEMP.



2. SCOPE OF THE CEMP

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

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

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

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

This CEMP provides a mechanism for ensuring compliance with environmental legislation and statutory consents. It defines the approach to environmental management at the site during the construction phase and addresses all relevant environmental aspects of the management of site preparation and construction work within the development works area. An aerial view of the windfarm is included on Figure 2-1.



Figure 2-1 Existing Wind Farm Site – view looking south from location of T5



Ireland

Lough Derg

53°8'N

7°55'0'W

Legend

- Proposed Wind Farm Site Boundary
- Proposed Grid Connection Route

Site Layout

- Proposed Turbine locations
- Proposed BESS
- Proposed Construction Compounds
- Proposed Borrow Pit 1
- Proposed Borrow Pit 2
- Proposed Borrow Pit 3
- Deposition Areas
- Turbines Hardstands
- Met Mast Location
- Overrun Area
- Proposed Passing Bay
- Proposed Site Roads
- Proposed Substation Location
- Turbine Foundations
- Turning areas
- Wheelwash

0 500 1,000
Meters

Spatial Reference Datum: IRENET95 EPSG: 2157		Copyrights: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community.	
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Client:

Project:

Ballincor Wind Farm

Title:

Figure 2-1:
Proposed Wind Farm Site Layout

Scale @ A3: 1:20,000

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3. CONSTRUCTION METHODOLOGIES

3.1 OVERVIEW OF CONSTRUCTION METHODOLOGIES

3.1.1 Turbine Hardstand, Foundations and Erections

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

Ground investigations in the form of trial pitting, boreholes, peat probing, and use of augers have been carried out along the proposed turbine locations and hardstanding locations to inform the depth of excavation and upfill required (See Appendix 8-1 (Site Investigation Report)).

Construction of the turbine bases will require excavation of the surrounding soil or peat from the foundation and crane hardstanding area to founding level with access being provided from adjacent roads at or near the surrounding ground level. The soil or peat will be replaced with granular fill where required.

Each wind turbine will require piled foundations or a gravity foundation of reinforced concrete (RC) foundation comprising a base slab bearing onto rock or other competent substrata. The foundations for each turbine will be designed by the appointed Civil Designer. Piled foundation bases are generally 24-26 m in diameter and gravity foundation bases are typically 24-26 m in diameter with detailed foundation design being dictated by the local ground conditions.

Three main foundation solutions have been identified:

- Gravity Foundations;
- Concrete driven piles; and
- Bored piles.

The material encountered in the trial pits excavated at each turbine location was generally soft to stiff (**Error! Reference source not found.** of Chapter 8, EIAR). Deeper excavations to more competent material will be required to construct the turbine foundations. It should be noted that, although it is anticipated that most foundations will be required to be piled, it is likely that some turbines could utilise gravity foundations. Where foundations are not piled, additional fill material will be needed to upfill the excavation to the levels required for the wind turbine foundations. An excavation of up to 4.5 m below ground level is anticipated at each turbine foundation. Gravity, bored pile and driven pile details are shown on Planning Drawings 11333-2041 to 2043.

Following site visits and site design, volume calculations provide an estimation of fill required for the hardstands. This is predicted to be approximately 110,000 m³ of gravel and stone material. Some material (c.40%) will be obtained from the on-site borrow pits with only the surface 150mm layer to come from local quarries which are within reasonable proximity to the site. Each turbine foundation will require between 650-750 m³ of concrete which will be sourced from offsite suppliers.

The geotechnical investigations indicate that the foundations at the proposed wind farm will be excavated. Piling is anticipated for a number of Turbines including T3, T4, T8 and T9.

Each of the turbines to be erected on site will have a reinforced concrete base. Overburden will be stripped off the foundation area to a suitable formation using a 360° excavator and



will be stored as detailed in the CEMP (Appendix 2-3), Section 3 and in the Peat and Spoil Management Plan (Appendix 8-2). The sides of the excavated areas will be sloped sufficiently (2:1 for mineral soil, 1:1 for rock) to ensure that slippage does not occur. Excavations will be approximately 4 metres deep.

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

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

The construction methodology for hardstandings will be as follows:

- The formation will be prepared to receive the geotextile membrane.
- Stone will be placed and compacted in layers
- A drainage ditch will be formed, within the excavated width and along the sides of the hardstanding.
- Surplus topsoil will be placed along the side of the hardstanding and dressed to blend in with surrounding landscaping.

The hardstand area subbase material will be sourced on site, with concrete locally sourced, in quarries in proximity to the site.

3.1.2 Wind Farm Site Access tracks

Site access tracks will be constructed to each turbine location, and to all proposed site infrastructure as shown in the Figure 2-2 and the planning drawings, with a proposed running width of 5m to 6m. The access track at the main site entrance to Compound 4 is 7m-10m to allow for ease of access from the R492. Passing bays will be included along internal access tracks strategically, as indicated on the planning drawings. There are three road construction methodologies; floating roads, upgrading of existing site access tracks, and excavated new founded roads. These are described below in further detail below.

Sections of founded roads and floating roads are shown on Drawing 11333-2024. Where required, the road widths will be increased to a maximum of 10m to form the indicated passing bays, as shown in Figure 2-5 (see Chapter 2) and the application planning drawings.

The access sites will be designed in accordance with the Transport Infrastructure Ireland's DN-GEO-03060 (May 2023) Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions).

3.1.2.1 Excavated New Road

Tracked excavators will be used to carry out excavations. Surplus excavated material will be dealt with as set out in this CEMP and the Peat & Spoil Management Plan – Appendix 8-2 of this EIAR). The excavated tracks will be constructed as per Drawing 11333-2033.

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

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

3.1.2.2 Upgrade of Existing Site Access Tracks

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

Where an existing track needs to be widened, it will be carried out on both sides, and the same steps as described in the new track construction above will generally be followed (without excavating the existing track material) – see cross section Drawing 11333-2033. There are no significant known constraints running alongside the access tracks to be upgraded, but where forest or drainage channels are located alongside the track (as they occur frequently through the site), they will be moved as required during dry weather periods.

Tracked excavators will be used to construct this track type. When the topsoil has been removed and/or the formation layer has been reached, stone from the on-site borrow pits will be placed to form the track foundation. The foundations of the new and existing sections of the track will be built up to the required level. The sub grade will be compacted with the use of a roller or other similar compaction method. The top dressing will be added to the tracks at this point. As a final measure to ensure long term stability of the track this layer will be checked and repaired as required after all turbine bases have been poured (i.e. after the heavy wearing traffic is largely finished).

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

Further details of the construction methodology for upgrading existing site access tracks is provided in this CEMP and further detail is provided in the Peat and Spoil Management Plan, provided as Appendix 8-2.

3.1.2.3 Floating roads

The construction methodology for permanent floating roads, is summarised as follows:

- A geotextile separation layer is placed on the existing ground surface.
- A biaxial geogrid is then placed over the geotextile.

- Where the CBR of the underlying material is >1%, 400mm of class 1A/6F2/6I/6J material followed by 100 mm of a compacted Clause 804 will be used for a running layer to give a total road thickness of 500m.
- Where CBR of the underlying material is <1%, 300 mm of Class 1A/6F2/6I/6J material will be placed, followed by a second layer of biaxial geogrid, followed by 300 mm of Class 1A/6F2/6I/6J material, followed by a 100 mm of a compacted Clause 804 running layer for a total road thickness of 700 mm.
- Permanent floating roads for wind farm access will be designed to a running width of 5.0m.

Typical sections of a new permanent road are shown on Planning Drawing 11333-2023. Where required, the road widths will be increased to form the indicated passing bays.

3.1.2.4 Proposed Clear Span Bridges and Culverts

There is one proposed river/stream crossing, over the Holy Well Clohaskin River, between T2 and T3 as shown on the planning drawings. The crossing method of a clear span bridge will avoid in-stream works.

At the stream crossing, the site access tracks will firstly be constructed to allow easy access to the works area (as described in the previous section), as there are currently no access roads at this location. The sediment control measures including silt fences will be installed before the works occur within 50m of the river (Chapter 9 of this EIAR (Hydrology and Hydrogeology) and this CEMP. Following this, the topsoil will be stripped from the foundation footprint on either side of the watercourse, taking care to avoid disturbing the river/stream bed or banks.

Topsoil will be stripped and used as part of the construction of new site access roads and turbine hardstands. Only tracked machines will be permitted to travel off the road surface. No excavations will be permitted within the river channel. Suitable stone fill material (clause 804 or similar) will be added in layers and compacted to form the base of the foundation. The precast clear-span bridge will be placed onto this either as one or more pieces using a mobile crane. There will be no requirement for large-scale casting. Where plastic or concrete culverts are required for forest /field drainage ditch crossings by new or upgraded roads, they will be installed with a minimum gradient of 1%. The pipe will be placed into the drain bed, and some of the underlying material will be placed within the pipe to benefit biodiversity (for further information see Chapter 6 of this EIAR (Biodiversity)). The use of corrugated culverts will aid in the retention of sediment, thereby naturalising the culvert bed. Large stones will be placed at the culvert outfall to dissipate any flow and reduce the potential for erosion. The culverts will be inspected regularly to ensure they do not become blocked.

3.1.3 110 kV Substation and Electrical Works

The proposed substation will be designed and constructed to meet all the required EirGrid/ESB standards. An area will be levelled and built to the required level with stone fill material, capped by high quality compacted stone. Two control buildings will be constructed using traditional techniques for constructing small buildings (i.e. concrete block walls, timber and slate tile roof). Foundations will be built for all of the proposed electrical infrastructure. All the electrical equipment will be installed to EirGrid/ESB



requirements. Perimeter fencing will be constructed around the substation compound for security and safety purposes. Further information and drawings of the substation and electrical infrastructure are provided in the planning drawings while the associated construction methodologies provided in Appendix 2-5.

The BESS will comprise a series of 90 battery containers and associated equipment will sit on reinforced concrete slabs. The containers are standard ISO 668 sizes (e.g., 20-foot) for transport. BESS containers arrive pre-assembled and pre-tested with inbuilt fire and monitoring.

The containerised system is optimised for easy delivery, construction and for safety. The container system integrates thermal management (air/liquid cooling), fire suppression, and monitoring. The surrounding site areas will be surfaced using a permeable gravel surface. The BESS access track will also be constructed and surfaced using a permeable gravel surface. A local electricity supply will be made from the nearest suitable power lines at the time of construction in the same way that residential houses are connected. Standard overhead electricity poles and cables will be installed avoiding sensitive habitats and using a minimal footprint.

Internal cables connecting the wind turbines to the on-site substation will be laid within or immediately adjacent to the on-site access roads. All cables will be laid in underground ducts.

3.1.3.1 Proposed GCR

It is proposed to supply the power from the Ballincor Wind Farm to the Irish electricity network via tail fed 110kV underground cables (approximately 12.23 km cable length to the existing EirGrid substation in the townland of Clondallow Co. Offaly).

It is proposed to HDD at one river crossings (Little Brosna River), drainage channel crossing W2, at a cattle underpass and at TN-N52-008 (former) railway bridge.

Connection works from the on-site substation to Dallow 110 kV substation will involve the installation of ducting, joint bays and ancillary infrastructure along the existing road network – See Appendix 2-5. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces.

It is expected that partial road closures will be put in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems – See Chapter 14 Traffic of this EIAR. Local diversions will be in place. 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 shall be undertaken on a rolling basis with short sections closed for short periods before moving onto the next section.

As part of the scoping and consultation process for the project, searches of existing utility services were carried out to identify areas where major assets exist such as high voltage electricity cables or gas mains – See Chapter 15 Material Assets of this EIAR. Private utility and telecommunications companies were also consulted during this period. No gas or high voltage cables are present on the site. Water infrastructure and other services are detailed in Appendix 2-5.

Connection works from the on-site substation to Dallow 110 kV substation will involve the installation of ducting, joint bays and ancillary infrastructure 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.

A rope will be inserted into the ducts to facilitate cable-pulling later.

The cables will be laid in trenches as per EirGrid Specification (See Trench Bedding Details in Appendix 2-4). There will be three stream/river crossing and four drainage channel crossings along the GCR.

The drilling process involves pumping a drilling fluid through the drill head, which is inert, natural and biodegradable (e.g. Clear Bore™). This fluid will be used sparingly and only as required to avoid an excess and will be appropriately stored in a sealed containers when not in use. This fills voids locally around the drill head and enables the drill to progress. Should any excess drilling fluid occur, it will be contained and removed for disposal at a licensed waste facility. The duct will be positioned, and the launch and reception pits will be refilled.

Further details of this crossing method are provided in Appendix 2-5 of this EIAR.

Instream works are proposed for the Woodfield_25 stream where a dam and flume methodology will be utilised.

3.1.3.2 110 kV Underground Cable Trenches

The number and layout of cables is an important consideration in the design of the proposed wind farm site and GCR. Minimum safety distances and angles etc. must always be maintained. This has been a fundamental consideration in determining the final location of the substation buildings and electrical infrastructure. Further information and drawings of the underground 110kV cable trenches are provided in the planning drawings while the associated construction methodologies are provided in Appendix 2-5. A copy of the EirGrid 110 kV cable installation specifications are provided as Appendix 2-4.

The 110kV cables will be installed within the internal access roads in the proposed wind farm site and within the existing public road corridor as described in Section 3.1.3 above.

A section of the route (approximately 0.8km) will be located off road on the Clondallow local road as there is limited capacity to install within the local road. A service/maintenance access track will be put in place over the entire route. It should be noted that works within the public road corridor will also be subject to further consents/agreements with local authorities, for example a Road Opening Licence as appropriate.

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

All cables will be laid in underground ducts. Ducts will be installed mostly by open trenching. The sequence of operations for installing ducts in trenches is to firstly strip off the ground material. A trench is then formed to the required depth and width. The ducts are generally

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

The 110kV underground cable required to facilitate the GCR will be laid beneath the ground surface and/or public road using the following methodology:

- The area where excavations are planned will be the subject of a confirmatory survey, prior to the commencement of works, with a cable locating tool and all existing underground services will be identified.
- A verification condition survey will be carried out for all parts of the route within the public road. Details of this survey will be agreed with the local authority in advance of the survey.
- Traffic management will be put in place before any works on public roads.
- A trench will be opened using an excavator to accommodate the required depth and width.
- The excavated material will be cast to the side to be reused as appropriate. This material will not be stored in the vicinity of any watercourse and will be smoothed with the back of an excavator bucket to minimise runoff. It will be cast on the upgradient side of the trench, so if any runoff did occur it will run into the down gradient trench. Excavated tar and excess material from the public road network will be transported off site by an appropriately authorised waste collector and disposed of at an appropriately licenced waste facility.
- Excess material will be used on the site of the proposed wind farm for borrow pit reinstatement and local landscaping. In the case of any material deemed as contaminated, a licenced waste carrier will transfer to an appropriate waste facility.
- Silt fences will be installed alongside the road/works areas as required near streams.
- Clay dams/plugs will be installed at regular intervals (depending on the gradient) to prevent conduit flow of water within the trench. These utilise low porosity clays over the full depth of the trench at regular intervals to prevent water moving along the trench.
- Works will not be carried out during periods of heavy precipitation. In the event that some surface water does accumulate in the trench, this will be allowed to percolate into the ground naturally.
- The trench will be surfaced in accordance with the road surface specifications of the local public road, or (in the case of off-road section) an EirGrid/ESB specification gravel access track to allow very occasional access for maintenance vehicles if required.
- Cable joint pits are normally located at regular intervals as shown in the planning drawings. Each joint pit will be approximately 2.5m x 6m in size with a communications chamber and an earth link box in close proximity to the joint pit as



shown in the planning drawings. They will be constructed off narrow sections of the public road where this is possible (i.e. before/after it enters the road corridor, in lay-bys, etc.) A temporary surface is provided over these for safety and to allow easy access until the cables are pulled, after which time the area will be permanently reinstated/surfaced as appropriate. The location of these joint pits are provided on site layout drawings Drawing 05725-DR-101 and 05725-DR-102 in Appendix 2-5.

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

Further details on the design for the grid connection cable trenches are provided in the planning drawings while the associated construction methodologies are provided in Appendix 2-5.

3.1.3.3 Stream Crossings GCR

The GCR contains three stream/river crossings and four drain crossings, as detailed above in Section 3.1.3.

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

3.1.3.4 Horizontal Directional Drilling – Railway bridge and Cattle underpass

There are two (non-aquatic) HDDs along the GCR to cross a former railway and a cattle underpass bridge.

Table 3-1 Proposed GCR HDD crossing details – Railway bridge and Cattle underpass

TLI number	Crossing details	Proposed crossing methodology	In Stream works required?
Bridge 1	Former railway Bridge	HDD off road	N/A
S10	Cattle underpass	HDD within road	N/A

A launch and reception pit is required for directional drilling, with each measuring approximately 1m wide, 2m long and 1m deep. The UGC will consist of 3 no. 160 mm diameter HDPE power cable ducts, 2 no. 125 mm diameter HDPE communications duct and a 125 mm Earth Continuity Conductor duct to be installed in an excavated trench between the proposed wind farm substation and existing Dallow 110 kV Substation. A specialised directional drill machine will be anchored to the ground and will drill at a suitable shallow angle to allow it to achieve the required depth for the bore. If ground conditions are unfavourable, the drilling process will need to be repeated using progressively larger drill heads until the required size is achieved. The drilling process involves pumping a drilling fluid through the drill head, which is inert, natural and biodegradable (e.g. Clear Bore™). This fluid will be used as required to avoid an excess and will be appropriately stored in a sealed container. This fills voids locally around the drill head and enables the drill to progress without the hole

collapsing. Should any excess drilling fluid occur, it will be contained and removed for disposal at a licensed waste facility. The duct will be positioned, and the launch and reception pits will be refilled.

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

3.1.4 Permanent Meteorological Mast

The met mast installation works will be carried out by a small crew and are described as follows. An access track will be extended towards the mast location from the existing forestry track. The access track will be 3.5 m in width. Associated drainage infrastructure will be extended also. A small stone crane pad will be constructed in front of the proposed mast location. General construction methods for the above access track and hardstanding will match those described for wind farm access tracks and hardstandings.

The foundation will be excavated followed by shuttering, steel fixing and finally concrete pouring by ready mix truck. Excavation and concrete operations will be carried out in accordance with this CEMP. The foundation will be 10 m x 10 m x 1.8 m in size. Following crane setup, the mast sections will be delivered and unloaded by truck. In accordance with an agreed lifting plan, mast sections will be lifted by crane into place. Wind speeds will be monitored at all times during lifting operations by the lead climber and crane operator. Mast sections will be bolted together by climbers.

Following erection of main mast sections, lightning protection and other ancillary components will be fixed to the mast. The mast will be decommissioned using a similar methodology as the construction except in reverse.

3.1.5 Forestry Felling

For the footprint of the infrastructure and associated felling buffers, there will be full tree removal.

A report detailing the forestry felling is provided as Appendix 2-8. It should be noted that the clear-felling of trees requires a felling licence. The associated afforestation of alternative lands equivalent in area to those lands being permanently clear felled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing.

For the purposes of the proposed project, the Applicant commits that the location of any commercial forestry replanting (alternative afforestation) associated with the project will be greater than 10 km from the proposed wind farm site and also outside any potential hydrological pathways of connectivity i.e. outside the catchment within which the proposed project is located. Broadleaf replanting will take place on the proposed wind farm as part of the biodiversity enhancement and management plan (BEMP) – See Appendix 6-1. The BEMP includes a number of measures. On this basis, it is reasonable to conclude that there will be no more than imperceptible indirect, or in-combination effects associated with the replanting. In addition, the Applicant commits to not commencing the proposed project until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority. Trees will be manually felled inside the 10m stream buffer.



The approach to afforestation requirements associated with the project is attached in Appendix 2-8.

3.1.6 Borrow Pits

Material will be extracted from the borrow pits. There will be some small stockpiling of material, but these will be kept to a minimum. In general, construction will start from the south and centre of the site and work northwards. Borrow Pit 1 is located to the south of the BESS and on-site 110 kV substation. This borrow pit will not be reinstated as it will act as a flood compensation area as detailed in the FRA – See Appendix 9-3.

Borrow pit 2 and 3 will be used for the construction of the infrastructure in the southern half of the site. As construction moves to the northern half of the site a second and third borrow pit will be used. The borrow pits will be reinstated with any mineral and peat soils, or any spoil remaining once landscaping works have been completed. Further detail on the construction of the borrow pits is provided in Chapter 8 (Land, Soils and Geology) of this EIAR.

Any soils/subsoils removed from the borrow pits will be temporarily stockpiled in accordance with best practice. During the extraction of the first borrow pit, removed spoil will be stored in a temporary stockpile with appropriate gradient (i.e. 1:2) and appropriate mitigation will be used to ensure the protection of downgradient watercourses (i.e. the use of silt fences, collector drains, Siltbuster, etc.).

Details on the borrow pit drainage is included in Appendix 9-4 SWMP. All surface water run-off from the borrow pits will pass through settlement ponds. It is proposed to locate settlement ponds downstream of borrow pits and associated stockpile areas, each hardstand and along all the proposed wind farm site access tracks.

Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

All of the spoil temporary stockpiles will be located on relatively flat areas with the exception to where material is side cast from small/narrow pieces of infrastructure.

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

3.1.7 Temporary Construction Compounds

Four temporary construction compounds are located within the proposed wind farm site, as detailed in Figure 2-2. The Construction compounds are as follows:

1. Compound 1 - The BESS compound will be initially utilised at the early stage as the main construction compound to minimise the landtake;
2. Compound 2 - Substation Compound to the south of the on-site 110kV substation;
3. Compound 3 - Central Construction compound near T7; and,
4. Compound 4 - Southern construction compound near the southern site entrance.

Any mineral soils removed during construction will be stored for later use in reinstatement. At the end of the construction phase, the compounds will be removed, with any stone being used

towards reinstatement of the nearest on-site borrow pits. After removal of the compound, the area will be recovered in soil and replanted with forestry as described in Appendix 2-8.

3.1.8 BESS

The 90 battery containers and associated equipment will sit on reinforced concrete foundations. The surrounding site areas will be surfaced using a permeable gravel surface. The site access track will also be constructed and surfaced using a permeable gravel surface.

The BESS system will have an inert gas fire suppression system. Water from an onsite water tank will only be used to dampen down the site boundaries.

It is proposed to install CCTV cameras on site for security purposes. The CCTV will be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the site.

4. CONSTRUCTION MANAGEMENT

4.1 CONSTRUCTION MANAGEMENT

4.1.1 Construction Phase Monitoring and Oversight

The construction Contractor will be responsible for implementing the mitigation measures specified in Section 6 of this CEMP and for communicating the requirements with all staff on-site. The implementation of the mitigation measures will be overseen by the supervising site staff, including the Environmental Manager, Ecological Clerk of Works (ECoW), site supervisor, archaeologists and/or geotechnical engineers, as appropriate.

The surface water drainage system will require weekly and daily inspections depending on the construction phase works to ensure that it is working optimally. Settlement ponds will require regular inspection and cleaning where sediment collects. The drainage and treatment system for the proposed wind farm will be monitored more frequently during/after heavy rainfall events during the construction phase. A programme of inspection and maintenance will be designed and dedicated construction personnel assigned to manage the inspection programme.

This CEMP will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment are implemented.

4.1.2 Construction Activities and Timing

It is anticipated that approximately 120 persons will be employed during the peak construction period (see EIAR Chapter 5 (Population and Human Health)) and it is estimated that the construction phase will take approximately 24 months from starting on-site to completion of commissioning of the turbines. Any necessary removal of trees or scrub will be implemented outside of the bird breeding season in line with the Wildlife Act as amended. Where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance.

The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations will be restricted to between 07:00 hrs and 19:00 hrs Monday to Friday (excluding public holidays) and between 07:00 hrs and 14:00 hrs on Saturdays.

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

- Concrete pours for turbine foundations;
- During turbine installation when the weather is suitable (i.e. light winds);
- Delivery of oversized loads; and
- In the unlikely event of an emergency (this is unlikely - see Chapter 18 (Major Accidents and Natural Disasters)).

Any such out of hours working will be agreed in advance with Offaly and Tipperary County Council apart from in the case of an emergency and in line with the Schedule of Mitigation requirements of this EIAR (Chapter 20).

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries are often carried out outside normal working hours. Such activities are limited to the day of turbine foundation concrete pours, which are completed in a single day per turbine (can take >12 hours). Because of the scale of the main concrete pours that will be required to construct the proposed wind farm, the main pours will be planned weeks in advance and refined in the days leading up to the pour. Concrete pours are required for 11 no. wind turbines so they will require 10 days of longer working hours. A similar number of days with longer working hours would be needed for installation of the turbines during a period of calm weather (this is mostly limited to on-site activity).

To accommodate delivery of large turbine components along public routes it could be necessary on occasion to work outside of the core hours, with delivery of these oversized loads typically late evenings. It is expected 24-40 delivery events will be needed on a maximum of 24-40 days for delivery of these oversized loads which usually travel in convoys of 3-5 vehicles with a Garda escort.

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

- 24 months – Civils (including forestry felling and vegetation clearance, drainage, construction of site access tracks, hardstands, turbine foundations);
- 9 months – Electrical grid connection/substation installation and commissioning;
- 12 months – Site electrical (installing between turbines and substation, pulling cables);
- 4 months – Turbine deliveries and erection;
- 2 months – Commissioning.

The phasing and scheduling of the main construction task items are outlined in Figure 4-1 where January 2027 has been selected as a potential start date for construction activities. Where there is overlap between phases, this reflects the anticipated progression of work through the site, with different areas within the site at different stages of completeness.

	2027												2028											
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
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
Site Health and Safety	1																							
Site Compounds		1	1	1			1	1	1															
Site Roads	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3							
Turbine Hardstands					4	4	4	4	4	4	4	4	4	4	4	4	4	4						
Turbine Foundations						3	3	3	3	3	3	3	3	3	3	3	3							
Substation Construction, BESS & Electrical Works										6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Backfilling & Landscaping																								
Turbine Delivery and Erection																								
Substation Commissioning																								
Turbine Commissioning																								

Figure 4-1 Indicative Construction Schedule



4.1.3 Surface Water Management

4.1.3.1 *Existing Site Drainage*

The proposed wind farm is located within the Shannon Water Framework Directive catchments (hydrometric area) in Counties Offaly and Tipperary.

These waters are of low gradient near the proposed wind farm, representing natural watercourses typical depositing rivers. The Little Brosna River flows in a northerly direction to the east of the proposed wind farm site.

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

4.1.3.2 *Drainage and Silt Control*

The proposed surface water drainage system utilises sustainable drainage devices and methods. The measures have been developed based on the CIRIA (Construction Industry Research and Information Association) C648 (Control of water pollution from linear construction projects) guidance, and that guidance has itself been developed based on site experience in Ireland and the UK over recent decades.

A Surface Water Management Plan (SWMP) has been prepared (see Appendix 9-4). The purpose of this plan is to ensure that all works are conducted in an environmentally responsible manner so as to minimise any potential adverse impacts from the proposed project on surface water quality. The plan incorporates the following specific objectives:

- Provide overall surface water management principles and guidelines for all phases of the proposed project;
- Address erosion, sedimentation and other water quality issues; and
- Present measures and management practices for the prevention and/or mitigation of potential downstream impacts.

Construction Phase

During the construction phase, all run-off from construction areas will be controlled and treated to reduce suspended solids concentration prior to being discharged into the existing drainage network or overland. Examples of proprietary silt control measures are illustrated on Figure 4-2.





Figure 4-2 Examples of Proprietary Silt Control measures

Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. These flows will discharge diffusely overland, within the buffer zone before entering any watercourse. Regular cross flow and energy dissipation devices will be installed to divert overland flows and prevent these flows from entering the borrow pits. An overview of the surface water drainage system to be used across the proposed wind farm site during the construction phase is provided in Figure 4-3.

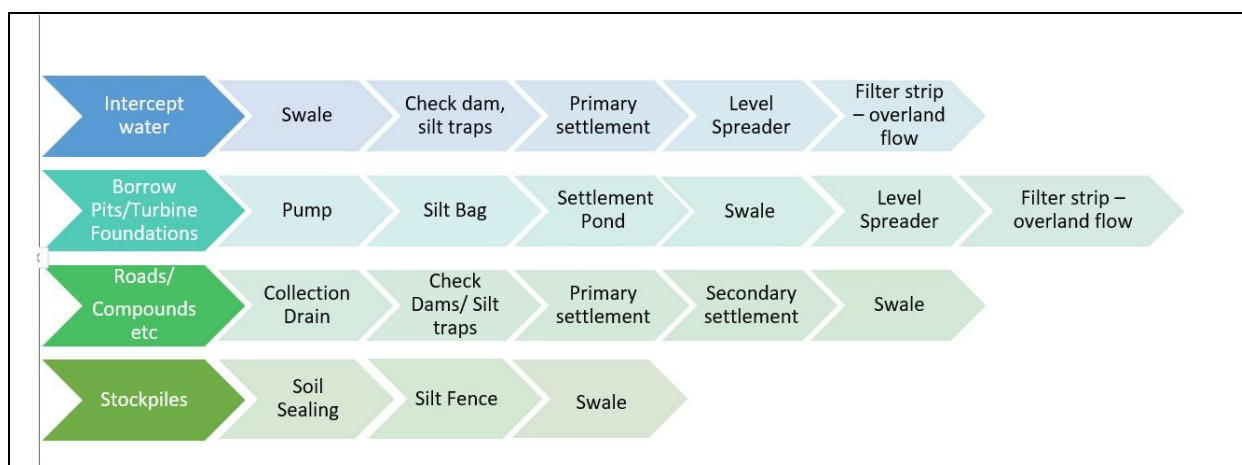


Figure 4-3 Treatment train

A number of temporary settlement ponds will be established during the construction phase along the proposed internal access roads and in areas of high construction activity (adjacent to turbine foundations, borrow pits, construction compounds etc.) to minimise silt laden run-off entering the drainage network. The settlement ponds will be designed to provide



sufficient retention time and a low velocity environment to allow suspended solids to fall out of suspension prior to allowing the water to outfall to the receiving environment.

Surface water runoff from hardstanding areas will be collected and discharged to associated settlement ponds adjacent to the proposed infrastructure. It will then be managed by gravity flow at greenfield runoff rates (i.e. the runoff of the site at natural rates without development). These diffusers will be used where overland discharge of water is carried out. The diffusers will prevent soil erosion at these locations by spreading out and slowing down the water.

4.1.3.3 Culverts & Clear Span Bridges

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

The use of a clear-span bridge will be used for vehicles crossing the Holy Well Cloghaskin. Therefore, there will be no direct effect on these streams at each proposed crossing location and downstream. Clear-span bridge will be sufficiently above the stream to allow unrestricted flow of water beneath. The proposed clear-span bridge locations are shown on (Chapter 2) Figure 2-2 and the design details are provided in EIAR Appendix 1-1.

4.1.4 Environmental Management

4.1.4.1 Concrete deliveries and pouring

Primarily ready-mixed concrete will be used during the construction phase, with all concrete being delivered from batching plants in sealed concrete delivery trucks. Localised mixing will be used for small tasks such as blockwork for building the substation. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks from large scale on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place. The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area. An appropriately licensed waste collector will collect these residual liquids and solids. Where temporary lined impermeable containment areas are used, such containment areas are excavated and lined with an impermeable membrane. This washout will be located near Compounds and also at any significant concrete pour locations (e.g. at turbine hardstand during a foundation pour) so that it is easily accessed when departing. An example of a concrete washout is shown in Plate 5-4.





Plate 4-1 **Example of a temporary concrete washout facility**

Although unlikely to happen any disposal of surplus concrete after completion of a pour will be off-site at the concrete production facility. Localised mixing of concrete for blockwork, etc. will only be carried out as needed, but any small volume of surplus will be disposed of in the concrete washout area.

4.1.4.2 Refuelling

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

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

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

No refuelling will be carried out within 50 m of a watercourse. Only designated trained and competent operatives will be authorised to refuel plant on site.

In the event of an accidental fuel spill, the source of the spill will be fixed, fuel will be contained and cleaned as quickly as possible using the fuel absorbent material in the spill kits. The incident will be reported to the site manager and Environmental Clerk of Works, and appropriate remediation will be carried out (i.e. soil removal for safe disposal at a licensed waste facility by licensed waste collectors).

4.1.4.3 Dust suppression

In periods of extended dry weather, dust suppression will be necessary along haul roads and along the site roads to ensure dust does not cause a nuisance to any residential properties long the route. If necessary, during a period of extended dry weather, water will be taken from settling ponds in the site's drainage system and will be pumped into a bowser or water



spreader to dampen down haul roads and site compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this will transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water would lead to increased risk of runoff.

4.1.4.4 Waste Management

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

Waste Management Plan

The main site contractor will ensure that all waste contractors have the correct permits for any waste streams they are removing from site, and that they are taking it to the appropriately licensed/permitted waste facilities. They will also ensure that all parts of the WMP will be implemented onsite. All waste generated from the construction phase will be managed in accordance with the provisions of the Waste Management Act 1996 as amended and associated Regulations. In line with good industry practice, the following measures will be implemented on site by the appointed Contractor for the duration of construction:

- Ensure all excavated topsoil and subsoils will be reused within the site boundary, insofar as possible, primarily for reinstatement of the borrow pits. Any excess material which cannot be reused onsite will be transferred offsite to a licensed waste facility. Similarly, any excess or unsuitable rock material which cannot be reinstated in the borrow pits will be transferred off-site.
- Ensure that any excess material which cannot be reused will be transferred off-site to a suitable licensed waste facility. Similarly, any excess or unsuitable soil / rock material which cannot be reinstated will be transferred off-site.
- Ensure typical waste streams (such as metals, paper, cardboard, plastics, wood, rubber, textiles, bio-waste, packaging, WEEE (electronic waste, batteries, accumulators and construction waste) will be managed, collected, segregated and stored in separate area(s) at the site before being removed off site by a licensed waste management contractor at regular intervals for the duration of the construction works;
- Provide skips and bins of appropriate sizes onsite in a designated area(s) and used to maximise source segregation of waste materials. This will include food and packaging waste from canteen and welfare facilities. Appropriate control of food waste in the compound will minimise the potential for pests and rodents to visit the area;
- Any contaminated materials used for spills and equipment maintenance works will be separately stored in a suitable container for collection by the appointed authorised hazardous waste contractor(s);



- Encourage all staff to minimise waste generation and to maximise the segregation of waste at source. Material wastage will be avoided by delivering only the required quantities of material to site and utilising off-site manufacturing of materials as much as possible;
- Establish 'just-in-time deliveries to avoid excess material storage at the site which can lead to waste generation. Delivery drivers will be encouraged to remove any excess packaging from materials delivered to site and remove unused timber pallets where possible;
- Reusable formwork for concrete pouring will be used where possible, in preference of non-reusable options. Other opportunities for material reuse across the site will be sought by the appointed Contractor;
- Due to the current nature / use of the site (commercial forestry / agriculture), it is not anticipated that there will be contaminated soils or materials encountered during the excavation works. No contaminated soils were identified during the site investigation works.
- It is noted that illegal dumping is common in large forestry areas and may be encountered at the time of construction. Where illegal dumping is discovered, appropriate communication and measures will be taken to try and identify the source of the illegal waste. The appropriate authorities will be notified, and the materials will be removed from site by authorised waste collection contractors and transferred to suitably licensed waste facilities;
- The Environmental Manager, or other appropriate person, will be designated by the appointed Contractor as the Waste Manager for the duration of the project in accordance with the general guidance set out in the Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects, published by the EPA in November 2021;
- At the pre-construction stage, the Waste Manager will be in a position to require fellow designers to take full advantage of all reasonable C&D waste prevention, reuse and recycling opportunities;
- During construction, the practicalities of waste prevention, salvaging re-useable materials, and the need to synchronise the recycling of waste materials through the timing of their use in the new construction works will be emphasised by the appointed Waste Manager.

4.1.4.5 Vehicle Management

Vehicles will be kept on site access roads for the vast majority of the construction phase, however in the initial construction phases, there will be some requirement for off-road vehicle movements (for forestry felling, ground works, etc.). For forestry felling, standard practices and equipment/vehicles will be used (as described in the Forestry Report – see EIAR Appendix 2-8).

For ground works and other off-road activity, the use of specialist vehicles that are tracked or use large low ground pressure tyres or bog mats which distribute their weight evenly across a large surface area will be used. These will minimise ground disturbance,



particularly where there is a presence of peat (albeit very shallow on this site) and therefore minimise the risk of sediment entering downstream watercourses.

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

4.1.4.6 Vehicle Washing

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

However, in accordance with best practice and to avoid the potential for the transfer of alien invasive plant species into the site, it is proposed to install a self-contained wheel-wash system. Water will be supplied for this using a water bowser.

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

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

4.1.4.7 Spoil Management

The use of the borrow pits will be phased. This will allow materials to be permanently placed in the first borrow pit while borrow pit 2 or 3 is in use, thereby minimizing the volume of soils requiring temporary storage. In order to further reduce temporary storage requirements, soils and turves will be reinstated around infrastructure as part of restoration and landscaping works. This will be carried out during the construction phase, as soon as is practical after the completion of the works in any one area of the site.

Where the proposed wind farm footprint is located on any mineral-based soil, this material will be side-cast and profiled as close to the excavation areas as practical. In the case where other adjacent infrastructure or constraint features might prevent side-casting, it will be used to reinstate the borrow pits. The sides of the borrow pit areas will be battered/sloped sufficiently to ensure that slippage does not occur (2:1 for mineral soil). The excavated side cast material will be smoothed with the back of an excavator bucket and surrounded by silt fences to minimise the potential for sediment-laden run-off occurrence. Side-casting will not occur within 50 m of a watercourse. The side-cast material will be used around the turbine foundations, or for landscaping locally or reinstatement elsewhere on site (such as the borrow pits). Further information on the spoil management is provided in Appendix 8-2.

Where side-casting is not possible, topsoil and sub-soil will be stockpiled separately. Turves will be stored turf side up and will not be allowed to dry out. Stockpiles will be isolated from



any surface drains and a minimum of 50 m away from watercourses, and will be located at points with easy access to internal roads within the proposed borrow pit areas which have not yet been extracted. Measures that will be employed will include interceptor ditches around these areas (with sediment traps within these – see planning drawings) deployment of double silt curtains and seeding of the piles will be incorporated to prevent runoff of suspended solids and soil erosion. No permanent spoil or stockpiles will be left on site.

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

4.1.4.8 Traffic Management

A Traffic Management Plan (TMP) for the construction phase of the proposed project is included as EIA Appendix 2-2. This TMP will be agreed in advance with the Local Authority and updated as appropriate.

4.2 KEY ROLES AND RESPONSIBILITIES

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

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

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



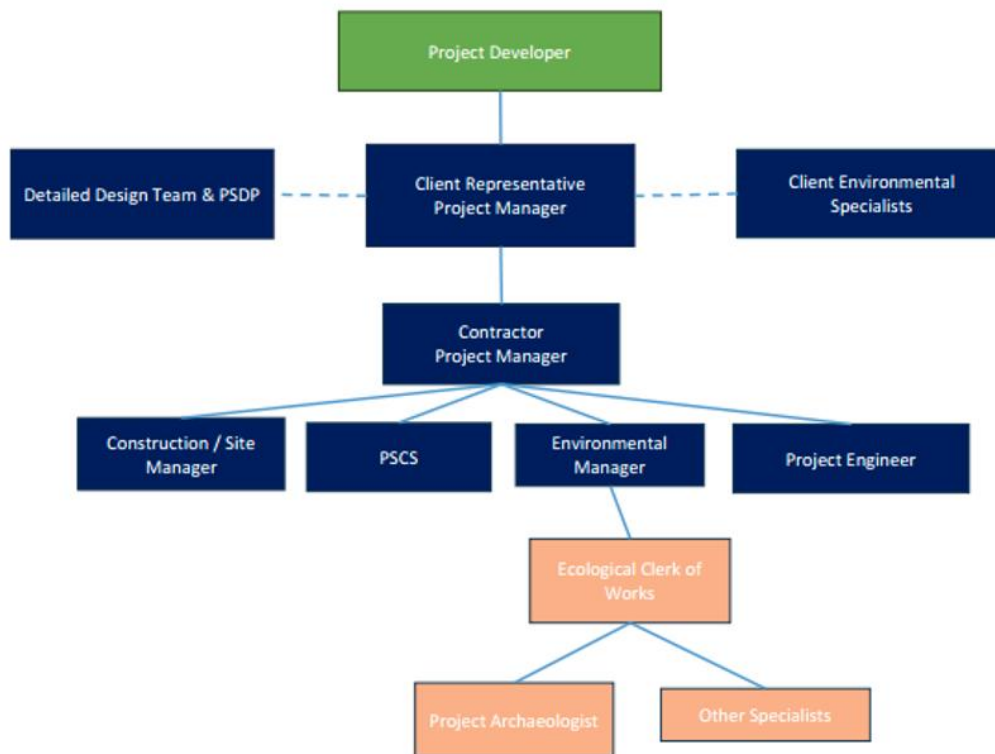


Figure 4-4 Site Management structure

4.2.1 Construction Site Manager

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

4.2.1.1 Environmental Manager

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

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

4.2.1.2 Ecological Clerk of Works

The role of the ECoW is defined by British Standard BS 42020:2013¹ as “*person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to “development” site personnel on necessary working practices required to i) safeguard ecological features on site and ii) aid compliance with any consents and relevant wildlife legislation related to the works.*”.

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

- The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role and in addition, where needed, can access support from senior ecologists within the company with the required qualifications, training and experience;
- The ECoW will have the power to “Stop Works” at any time they deem it necessary to do so;
- The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology / biodiversity as set out project EIAR, NIS and supporting documents such as the, CEMP etc.;
- The ECoW will be responsible for the day-to-day management and interaction with the project Environmental Manager;

- The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation;
- The ECoW will provide the contractors team, with advice on environmental issues and compliance with planning conditions, commitments etc. as required. This includes managing certain activities that may be required in discharging consent conditions. The ECoW will inform the Contractor and Project Developer Teams of any information that could increase the risk of a non-compliance and/ or require a new licence, consent or approval.

During construction there will be occasions when the ECoW will be required to rapidly respond to unplanned events such as any wildlife incidents, pollution incidents, etc. The ECoW will have a very specific role within the emergency response teams responding to these incidents. Further detail is provided in Section 6.0. The ECoW will also be expected to support the project team in resolving any other unplanned events that are not classified as emergency responses or incidents.

Non-Compliance Events

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

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

Reporting and follow up

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

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

Ad-Hoc Advice and Support

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

4.2.2 Project Geotechnical Engineer / Geologist

The Geotechnical Engineer / Project Geologist will report to the Environmental Manager and is responsible for inspection and review of geotechnical aspects associated with construction



stage of the project. The Geotechnical Engineer / Project Geologist will undertake design responsibilities and will provide periodic and as-required supervision of site preparation and groundworks (such as excavation activities) particularly for geotechnically sensitive or specialist works.

4.2.3 Project Archaeologist

The Project Archaeologist will report to the Environmental Manager and is responsible for inspection and review of any finds discovered during with the construction of the project. The Project Archaeologist shall undertake pre-commencement investigations and provide archaeological monitoring at defined locations and as identified in EIAR Chapter 13. Archaeological monitoring will be carried out under licence to the National Monuments Service of the DoHLGH.

Specific locations that will require archaeological monitoring include:

- The route of the new access road.
- The section of demesne wall associated with Sharavogue House (DL12). This will be cleared of vegetation prior to the commencement of construction and a full written and photographic record of the wall will be made.
- The excavation of the proposed GCR trench, where it passes to the west of AH109.
- The excavation of the GCR launch/reception pits for the directional drilling at BH 18 and BH68.

4.2.4 ECoW Responsibilities

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

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

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

4.3 COMPLIANCE AUDITS AND COMMUNICATIONS

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

- Environmental Audits, a programme of planned and spot check audits shall be developed and approved by the client;
- A programme of toolbox talks shall be developed. Toolbox talks covering relevant topics during construction;
- The ECoW and Environmental Manager will support the project team in producing site induction material tailored to the different activities carried out on site, and ensuring this material is appropriately incorporated into the overall project induction material. This will require attendance to project meetings, and production of material relevant to planning conditions and Environmental Legislation. The toolbox talks and site inductions shall include information on the role of the ECoW in the event of an incident;

- The ECoW shall ensure this information is included in the relevant induction and toolbox talk material. Once the above programmes and plans have been agreed, the Environmental Manager will be responsible for managing these plans and conducting the necessary audits, toolbox talks etc.;
- The ECoW shall check progress, and the Environmental Manager will be reporting on progress against the programmes, plans and status of completed audits, toolbox talks etc to the ECoW on a daily basis;
- The ECoW will be required to report on audits and toolbox talks delivered in the monthly compliance report;
- Occasionally the ECoW will be required to deliver toolbox talks and produce site induction material depending on the topic being considered.

4.4 FACILITIES, SAFETY AND SECURITY

The proposed Ballincor Wind Farm project will be constructed, in accordance with all relevant Health and Safety Legislation.

Aspects of the proposed project that will present health and safety issues include:

- Health and safety aspects of construction activities;
- General construction site safety (e.g. slip/trip, moving vehicles etc);
- On site traffic safety during construction associated with localised high road embankments;
- Traffic safety during the transport of abnormal loads to the site;
- Lifting of heavy loads overhead using cranes;
- Working at heights; and
- Working with electricity during commissioning.

A (Preliminary) Health and Safety (H&S) Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared prior to the construction stage by the Project Supervisor for the Design Process (PSDP).

Rigorous safety checks will be conducted on the turbines during construction. Signs will be erected at suitable locations across the site as required.

5. ENVIRONMENTAL EMERGENCY RESPONSE PLAN / PROCEDURES

5.1 HAZARD IDENTIFICATION

In order to establish the type of potential emergencies that may occur, the hazards identified in Table 6-1 have been identified as being potential situations that may require an emergency response they occur.

Table 5-1: Potential Hazards Identified

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

5.2 ENVIRONMENTAL EMERGENCY RESPONSE PROCEDURES

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

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

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

In the event of an environmental emergency, the Environmental Manager, ECoW and Project Manager will be notified immediately and will determine the scale of the emergency and the requirement for the assistance of emergency services. Works will cease in the area of the



incident and contact will be maintained with the emergency services to direct them to the scene of the incident as required.

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

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

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

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

5.2.1 Site Evacuation and Fire Drills

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

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

5.2.2 Spill Response and Control

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

- Identification and blocking of the source of the spill;
- Alerting personnel in the vicinity of the spill and any possible dangers;
- Elimination of any potential ignition sources in the vicinity of the spill;
- Spill containment approach and spill control materials;
- Covering or bunding off of any vulnerable areas where appropriate (i.e. drains, streams, sensitive habitats);
- Clean up using the spill control materials;
- Containment and disposal of used spill control materials;

- Communication with the ECoW – providing relevant information on the location, type and extent of the spill so that they can take appropriate action;
- ECoW actions including inspection of the site, making certain necessary measures are in place to manage the spill and prevent further spillage;
- ECoW notification to the appropriate regulatory body if necessary.

5.2.3 Incidents / Complaints

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

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

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

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

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

- The complainant, Project Developer and other stakeholders will be kept informed of the progress in resolving the complaint.

5.2.4 Emergency Contact Details

A list of emergency contacts is presented in Table 5-2. A copy of these contacts will be included in the Site Safety Manual and in the site offices and the various site welfare facilities.

Table 5-2: List of Emergency Contacts

Contact	Telephone
Emergency Services – Ambulance, Fire, Gardaí	112 / 999
Local Garda Station – Shinrone	0505 47122
Local Garda Station – Borrisokane	067 27101
Local Fire Station – Cloughjordan	999
Local Fire Station – Birr	057 93 27410
Local Doctor / GP Service – Shinrone Health Centre	0505 47312
Local Doctor / GP Service – Birr Health Centre	057 912 3200
Borrisokane Primary Care Centre	067 27672
Nenagh Hospital, Tipperary	067 31491
Midland Regional Hospital Portlaoise	057 862 1364
Tullamore Hospital	057 932 1501
ESB Faults / Emergencies	1850 372 999
Gas Networks Ireland 24hr Emergency Line	1850 20 50 50
Site Manager / Construction Manager / Site Supervisor	To be confirmed following planning process
Client / Developer: Manogate	To be confirmed following planning process
Ecological Clerk of Works (ECoW)	To be confirmed following planning process
Environmental Manager	To be confirmed following planning process
Project Supervisor Design Stage (PSDS)	To be confirmed following planning process
Project Supervisor Construction Stage (PSCS)	To be confirmed following planning process
Health and Safety Authority Ireland (HSA)	To be confirmed following planning process
Inland Fisheries Ireland (IFI)	To be confirmed following planning process
Project Engineer	To be confirmed following planning process



Project Ecologist	To be confirmed following planning process
Project Hydrologist	To be confirmed following planning process
Project Geotechnical Engineer / Geologist	To be confirmed following planning process
Project Archaeologist	To be confirmed following planning process

5.3 EMERGENCY COMMUNICATION PROCEDURE

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

5.4 INDUCTION CHECKLIST

Table 6-3 below provides a list of items highlighted in the Emergency Response Procedure (ERP) which must be included in the induction or gathered from all personnel that will work on the proposed project during the mandatory site induction. This will be revised throughout the various stages of the project. This list will be updated and expanded on within the Contractor's CEMP.

Table 5-3: Site Induction Checklist

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

6. MITIGATION AND MONITORING MEASURES AGREED

All mitigation and monitoring measures relating to the pre-construction and construction phases of the proposed project were set out in the various sections of the project EIAR, and Natura Impact Statement (NIS) prepared as part of the planning applications for this project.

This section of the CEMP groups together all of the mitigation and monitoring measures in a table and is presented throughout the following pages.

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

Table 6-1: Table of Mitigation Measures and Monitoring Requirements

Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
Pre-construction Phase				
Biodiversity				
1	Management of Invasive Non-native Species	EIAR Chapter 6	Invasive Species Management Plan will be prepared prior to the construction works commencing. The document will be prepared in line with best practice guidance on the management of invasive species (TII, 2020; NRA, 2010; SNH 2021, RAPID, 2021).	Monitoring and follow-up treatment protocols (if required) must be implemented to ensure any potential regrowth is effectively treated.
2	Biodiversity: Himalayan Balsam	EIAR Chapter 6	A pre-construction invasive species survey will be conducted along the GCR. This will be undertaken from April when the young plants are first apparent but before the flowering season in June. The control of the species must be implemented by suitably qualified contractors. The Himalayan Balsam will be pulled from the ground between mid (15) May and the end of (30) June before the seed pods develop. Pulling should be performed prior to the formation of the seed pods which explode at the slightest disturbance when ripe. Himalayan Balsam has very shallow roots, making uprooting by hand easy. The pulling technique must be undertaken so that the entire plant is uprooted. This is normally best accomplished when pulled from low down on the plant, near the root structure at the base. If snapping occurs at a node, the pulling must be completed to include the roots. Uprooted plants will be left to air dry and decompose on a non-permeable membrane within a site compound to prevent any part of the plant, including its developing seeds entering any watercourse and to prevent dispersion by wind. The plant material is to be removed to a licensed landfill site or buried at least 1m below ground level within the site compound. Once the initial stand of Himalayan Balsam has been pulled, the area of works will be covered with jute material prior to works commencing (or by ECoW approved equivalent) to degrade naturally. If it is necessary to track over this area, the jute material will be secured and steel road plates (or by ECoW approved equivalent) will be placed on top to avoid any ground contact of tracking machinery. If the soil itself needs to be excavated to facilitate the works this will be carried out under supervision of the ECoW, the material will be placed in big-bags or tonne bags. This material will either be removed from site by a licensed contractor, or it will be buried on site at least 1m below ground level. All areas containing Himalayan Balsam will be cordoned off and clearly marked as exclusion zones with invasive non-native species signage.	A multi-annual approach is required until the plant is eradicated from site.



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
3	Biodiversity: Himalayan Balsam Parrot's Feather	EIAR Chapter 6	A pre-construction invasive species survey will be conducted to establish the full extent of the infestation. Prior to any treatment works commencing onsite, the ECoW will agree the location for and supervise the demarcation of all working areas/bio-secure areas related to invasive species. This will include the establishment of bio-secure zone, haul route for materials and storage area. Careful preparation of the site and planning of the works is crucial to successful treatment of invasive species. Nobody will be allowed into the contaminated area once work has begun unless they have been inducted into biosecurity measures on site. The surrounding area will be isolated by closing the works area to all pedestrian and vehicular traffic during excavation and construction, until the site has been reinstated. Biosecurity measures shall be put in place to avoid the accidental transport of material. Biosecurity measures will consist of closing off the area to traffic and providing a clean-down and de-contamination area for all vehicles and equipment operating on site. Silt curtains will be installed within the drainage ditches at locations identified by the ECoW to contain any silt or plant fragments to prevent movement downstream should they become dislodged. Water levels will need to be low during the removal to ensure fragments of the invasive species do not travel downstream and spread further. This may be done by damming off the section of river during treatment. The works area surrounding the invasive plant will be bunded using sandbags, if possible, to create a dry working area prior to any removal works commencing. The plants will be mechanically removed. This will be confirmed by the ECoW who is monitoring the works. This treatment should be done by cutting the roots in the sediment with as little disturbance as possible to prevent fragmentation. All parts of the plant will be removed. After cutting the plant, jute matting should then be placed down on the treated area to block light on potential new shoots. Re-treatment must be applied as necessary.	Removal of the IAPS will also need to be carried out within the recommended timeline under the supervision of the qualified ECoW. Monitoring and follow-up treatment protocols (if required) must be implemented to ensure any potential regrowth is effectively treated.
4	Biodiversity: Otter, Badger and other protected mammals	EIAR Chapter 6	Pre-construction surveys for Otter, Badger, and other protected mammals will be completed within the proposed wind farm site by an appropriately experienced ecologist (ECoW). To identify any changes in protected mammal activity, such as the establishment of new burrows or other signs of use, within the ZOI of the proposed project.	As required through the Contractor's CEMP and Biodiversity Management Plan.



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			Conducted in accordance with NRA (2005) guidelines, no more than 10–12 months in advance of construction. If significant mammal activity is recorded within 150 m of the works footprint, an appropriate wildlife (derogation) licence will be obtained from the NPWS prior to commencement of works.	
5	Biodiversity: Common Frog	EIAR Chapter 6	A pre-construction frog spawn survey should be undertaken within wet grassland and drainage ditch habitats, including tyre rut pools, which may be disturbed during the Common Frog spawning season (1st March – 31st June, inclusive).	As required through the Contractor's CEMP and Biodiversity Management Plan.
6	Marsh Fritillary	EIAR Chapter 6	Pre-construction survey will be conducted within suitable habitat for Marsh Fritillary within the proposed wind farm site, which is limited to the mapped area surrounding the proposed compound at the southern entrance of the site and the proposed hardstand at T3. Pre-construction surveys for larval webs will follow best practice guidance (NBDC, 2021). The recommended survey season is late August to early September when the webs are most conspicuous (NBDC, 2021). However, the larval webs are also identifiable during early spring (March-April) following the hibernation period (Phelan et al., 2021). As such, it is at the discretion of the ECoW to identify the optimum time to conduct pre-construction larval web searches, as the spring window will likely best suit the timeline for the translocation of larval webs during the month of April (Section Error! Reference source not found. of the EIAR). It is essential that surveys are carried out in optimum weather conditions to improve success rate when searching for larval webs, as caterpillars are only visible in sunny weather. The ECoW will provide pre-construction briefings to contractors working within the proposed wind farm site, as appropriate, highlighting the presence of species and the associated strict exclusion zones (Section 6.7.1 of the EIAR).	As required through the Contractor's CEMP and Biodiversity Management Plan.
7	Devil's-bit scabious	EIAR Chapter 6	A second pre-construction survey is required within the donor site to ensure no butterfly have laid eggs on the leaves of Devil's-bit scabious. In order to make these pre-construction surveys effective they must be postponed until the August – September, during the optimum survey season for larval webs and following the implementation of mitigation measures for Marsh Fritillary.	As required through the Contractor's CEMP and Biodiversity Management Plan.
8	Biodiversity: Habitats and Flora	EIAR Chapter 6	Proposed construction work areas will be demarcated prior to the construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed wind farm site. Vegetation clearance will be kept to a minimum, where possible. Any necessary removal of trees or scrub will be implemented outside of the bird breeding season in line with the Wildlife Act as amended. Where the construction programme does not allow this time restriction to be observed, then these areas will be	As required through the Contractor's CEMP and Biodiversity Management Plan.



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey, otherwise repeat surveys will be required. Construction vehicles will be restricted to designated access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks. Large access mats will be used to mitigate rutting and reducing soil erosion and impact to the surrounding habitats. Replacement of access mats will be undertaken when they become heavily used and worn. All disturbed ground will be fully and appropriately reinstated following the completion of the works.	
Ornithology				
9	Management of Disturbance/Displacement	EIAR Chapter 7	Pre-construction surveys will be required to identify the location of any breeding birds onsite, in particular breeding Snipe, as well as other wader and raptor species. To minimise disturbance or displacement of this breeding bird species or other breeding species which may become established surveys will only be conducted between the months of April to July.	As required through the Contractor's CEMP and Biodiversity Management Plan.
Material Assets				
10	Underground Services	EIAR Chapter 15	A confirmatory survey of all existing services (electrical/ESB, water/Uisce Éireann, gas/Gas Networks Ireland (GNI)) will be carried out prior to construction to verify the assumptions in this report and identify the precise locations of any services. The Applicant will liaise with the service provider where such services are identified. Digging around existing services, if present, will be carried out as per best practice/guidance by hand to minimise the potential for accidental damage. Utility assets / services (underground and overhead) will be identified and clearly marked prior to any pre-construction (site clearance) / construction / demolition activity occurring; No excavations will take place without prior consultation with relevant utility asset owners / service providers; Digging around existing services, if present, will be carried out as per best practice/guidance¹ by hand to minimise the potential for accidental damage; Prior to any mechanical excavation taking place ESNB will be consulted with and the exact locations of all underground electricity cables established and verified; All works undertaken in the vicinity of underground assets will be carried out in accordance with current HSA guidance, namely the HSA 'Code of Practice for Avoiding Danger from Underground Services'; All works will be undertaken with in accordance with the exclusion and safe operating distances around electricity infrastructure as set out in the ESB Code of Practice, as well as HSA guidance including the 'Code of Practice for Avoiding Danger from Overhead Electricity Lines';	As required through the Contractor's CEMP.

¹ <https://www.gasnetworks.ie/home/safety/dial-before-you-dig/>

[Transmission Policies and Standards \(eirgridgroup.com\)/ Publications \(esbnetworks.ie\)](#)



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			Any proposed works will require a minimum clearance distance of 1 m either side of electrical cables ² ; Liaison with asset owners / service providers will continue as required throughout the construction phase.	
Archaeology				
11	Test Trenching	EIAR Chapter 13	Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the greenfield locations of the proposed project. This work will be carried out under licence to the National Monuments Service of the DoHLGH. Dependent on the results of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring.	Any further monitoring will require agreement from the DoHLGH.
Construction Phase				
Biodiversity / Ecology				
12	Invasive Species Management	EIAR Chapter 6	A strict biosecurity demarcation area will be installed by the ECoW within the zone where Third Schedule listed INNS are present - 10m from each stand (unless it is not feasible for Health & Safety reasons – e.g. roadside); Only works outside the biosecurity area will be allowed to proceed. If any of the proposed works will be required to break the biosecurity area mentioned above, a specific and detailed Invasive Species Management Plan (ISMP) will be developed by the contractor; The ISMP will detail a strategy of uprooting the INNS plants, currently present at the proposed wind farm site and along the GCR, the most effective management measure for the control of each species.	As required through the Contractor's CEMP and Biodiversity Management Plan.
13	Badger	EIAR Chapter 6	In accordance with NRA (2005), exclusion of badgers from disused or currently inactive setts, may be undertaken during any season. Works to temporarily exclude badgers from any currently active sett will only be carried out during the period of July to November (inclusive) in order to avoid the badger breeding season. Extensive detail on this topic is available in Chapter 6 and is aligned with best practice.	As required through the Contractor's CEMP and Biodiversity Management Plan.
14	Badger, Otter Timing of Works, Lighting and Noise	EIAR Chapter 6	All construction works within 150m of any suitable Badger habitat or known sett, will be confined strictly to daytime hours between 08:00 and 18:00. Works will not commence or conclude during civil twilight periods. High noise activities such as piling or rock breaking within 150 metres of known Badger setts will be restricted to daytime hours and kept to the shortest practicable duration. Where	As required through the Contractor's CEMP and Biodiversity Management Plan.

² ESB Networks – Code of Practice for Avoiding Danger from Underground Services (2022)



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			operational requirements necessitate deviation from these hours, the works will be subject to review and approval by the ECoW. To reduce impacts to Badgers, Otter and Bats all site lighting will be directional, downward facing, and shielded. Lighting will be used only where required for safety and will not be directed towards woodlands or known Badger setts, for Otter lighting will not be directed towards riparian habitats. Reduction of light levels or application of motion sensor lights will be used where bat foraging habitat is present. All construction phase lighting systems will be designed to minimise nuisance through light spillage and follow ILP (2023) guidance³. All non-essential lighting will be switched off during the hours of darkness.	
15	Otter - Response to Discovery of Otter Holts	EIAR Chapter 6	In the event that a new holt (established within the interim period) is identified within the footprint of the works during the pre-construction confirmatory survey and the following mitigation measures will be applied in accordance with the NRA Guidelines for the Treatment of Otters during the Construction of National Road Schemes (NRA, 2006) as follows: No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts (NRA, 2006). Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence. No works will be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site (NRA, 2006). Breeding may take place in any season, so activity at a holt will be determined on a case-by-case basis by the ECoW. A prohibited working area associated with otter holts will be fenced and appropriate signage erected under guidance of the ECoW; If holts are found to be inactive prior to construction, exclusion of holts and their subsequent destruction may be carried out during any season under licence with the NPWS. To prevent the reoccupation of holts the entrances will be soft blocked (using vegetation and a light application of soil) for a period of five days (NRA, 2006).	As required through the Contractor's CEMP and Biodiversity Management Plan.
16	Bats	EIAR Chapter 6	The absence of roosting bats will be confirmed immediately prior to the removal of PRF-I (potential roost features for individual bats) trees with an internal inspection of the potential roost features. These trees will not be removed during the hibernation period (November – March inclusive) to avoid the potential for disturbance effects on any bats which may be in torpor (deep sleep). Where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the	As required through the Contractor's CEMP and Biodiversity Management Plan.

³ ILP (2023) Guidance Note 08/23. Bats and Artificial Lighting at Night. Bat Conservation Trust



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey, otherwise repeat surveys will be required. Eight bat boxes will be erected at suitable locations outside of the buffer zones identified above, in consultation with a bat-licensed Ecologist, further detail in bat boxes is available in Chapter 6 of the EIAR.	
17	Bats – Proposed GCR	EIAR Chapter 6	Horizontal Directional Drilling (HDD) is proposed for bridge B08 – See Appendix 2-5. A minimum separation distance between the drill trajectory and the foundation of the bridge is 4 metres. A minimum separation of 45m between the launch and receptor pits. Hoarding or acoustic blankets to a height of the parapet wall will be provided prior to the commencement of work between both pits and the barrel facing the proposed works to reduce noise and visual cues.	An Ecologist will supervise the directional drill at this location
18	Larval Web	EIAR Chapter 6	Any larval webs identified within the footprint of the proposed project, inclusive of the works corridor, will be demarcated with temporary fencing. This temporary fencing will act to mark the location of the webs identified for translocation. An area of ca. 2m² will be fenced off around each larval web, in order to protect the larval webs from disturbance. Appropriate signage will be used to alert contractors to the purpose of the fence. Prior to the erection of the fence, the ECoW and the contractor will decide a suitable route to take while traversing the Marsh Fritillary habitat, in order to minimise disturbance to larval webs and supporting habitat. The installation of the fence will be undertaken using appropriate lightweight machinery, as needed and under the direct supervision of the ECoW. The use of heavy machinery will not be permitted within Marsh Fritillary habitat during the installation of fencing. Where avoidance of Marsh Fritillary habitat and larval webs is not possible, this will necessitate the translocation of all larval webs identified within the footprint of the project. Extensive detail surrounding translocation is available in Chapter 6 of the EIAR, and is aligned with best practice.	A report will be prepared by the ECoW detailing the methods followed and the results of the translocation. The report will be made available to the contractor and the competent authority. Continued monitoring will take place and associated reports will be issued in year 1, 2, 3, 5, and 10 and every five years thereafter.
19	Marsh Fritillary	EIAR Chapter 6	ECoW will monitor Marsh Fritillary activity from the second week in May to the peak emergence period in the first week of June. A decision will be made by the ECoW to begin vegetation management sometime between mid-May to mid-June. Vegetation management will be limited to the footprint of the compound at the southern entrance to the wind farm site and the hardstand at T3, inclusive of the identified works	As required through the Contractor's CEMP and Biodiversity Management Plan.



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			corridor. Further detail regarding vegetation management related to this is available in Chapter 6.	
20	Translocation of Devil's-bit scabious	EIAR Chapter 6	In order to promote the establishment of Devil's-bit scabious within the GS4-Wet grassland receiving site, it is recommended to translocate turves of vegetation from the donor site. The removal of Devil's-bit scabious from the donor site will only be done following the full implementation of mitigation measures for the Marsh Fritillary. Further detail is available in Chapter 6.	As required through the Contractor's CEMP and Biodiversity Management Plan.
Ornithology				
21	Construction Phase Toolbox Talks	EIAR Chapter 7	Regular toolbox talks with construction staff on disturbance to relevant bird species during construction will be organised. Will be mandatory, will run at the beginning of each season: in February, in preparation to the breeding season; and in August. Will include the description of the main ecological features staff should note, particularly the identification of KORs and signs of proximity to sensitive locations (e.g. raising awareness to alarm calls during the breeding season; description of ground-nesting species), and the processes of reporting any findings to the ECoW. If an important ornithological area does become apparent, the works will immediately cease, and the suitably qualified ECoW will clearly mark these areas, in line with appropriate buffer distances which have been outlined in Goodship and Furness (2022). The areas will be avoided until the chicks have fledged or where nesting has failed (in the case of breeding activity) or where birds are no longer found, roosting, feeding or foraging (in the case of wintering activity).	As required through the Contractor's CEMP and Biodiversity Management Plan.
22	Management of Habitats Loss	EIAR Chapter 7	Where areas of potentially sensitive breeding bird habitat are proposed to be removed during construction, these works will be timed to avoid the breeding birds nesting season from 1 March to 31 August. This measure will avoid any potentially significant effects to breeding bird species particularly in areas where hedgerow, scrub and woodland will be removed. In the event that the bird nesting season cannot be avoided, a suitably qualified ornithologist/ecologist will undertake a pre-construction survey of the vegetation proposed to be removed to establish the presence of breeding birds and nests. This survey will be conducted up to five days ahead of the works to identify breeding behaviour and nests. Where an active nest is found, the nest will be clearly marked and avoided until the chicks have fledged or where nesting has failed.	As required through the Contractor's CEMP and Biodiversity Management Plan.

Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
23	Management of Disturbance/Displacement	EIAR Chapter 7	As noted, any removal of scrub vegetation will be undertaken outside the bird breeding season, where feasible, which begins on the 1 March and ends on 31 August. Where this is not possible, these works/activities will not take place before a confirmatory survey of the affected area (i.e. ground-based nests) is undertaken by the ECoW. This survey will be conducted up to five days ahead of the works to identify breeding behaviour and nests. In the event of any key ornithological receptor nests being found, the works will immediately cease, and the suitably qualified ECoW will clearly mark these areas in line with appropriate buffer distances which have been outlined in Goodship and Furness (2022). These areas will be avoided until the chicks have fledged or where nesting has failed. Areas identified as supporting important wintering records of bird species, such as locations in proximity to T1, and sections of infrastructure along the Little Brosna River to the north-east of the proposed project, will be subject to seasonal restrictions on habitat removal and other potentially disturbing activities. Works related to this area will be scheduled outside the typical wintering period (October to March inclusive). To minimise disturbance or displacement of these wintering Key Ornithological Receptors (KORs) or other winter species which may have become established following the completion of surveys in 2024, such works will be scheduled outside the wintering period, typically from October to March inclusive. Should unforeseen circumstances require activity within this period, surveys will be undertaken up to five days before the works, by a suitably qualified ECoW to confirm the absence of KORs within the affected area. If wintering birds are present in large enough concentrations and assessed to be foraging, resting and/or roosting, works will be postponed or relocated to an alternative area until the birds have vacated. Physical exclusion zones and clear signage will be implemented where necessary to prevent accidental encroachment during the wintering season.	As required through the Contractor's CEMP and Biodiversity Management Plan.
Land, Soils and Earthworks				
24	Mitigation Geohazard/Peat and Soil Stability	EIAR Chapter 8	The management of peat stability will be ongoing throughout the construction and operational stages of the project and will be managed through the use of a geotechnical risk register. A physical barrier will be implemented between the excavations and the potentially unstable material at unstable conditions, in the form of a granular berm or sheet piles. The long-term	A suitably qualified and experienced geotechnical engineer or engineering geologist will monitor excavation works. The earthworks will not be carried



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			stability of the area around the wind turbine foundations will be achieved by filling the area back up to existing ground level following installation of the foundation.	out during severe weather conditions.
Hydrology and Hydrogeology (Water Quality Management)				
25	Alteration of Surface Water Quality	EIAR Chapter 9	The Standards for Felling and Reforestation describe the universal standards that apply to all felling (thinning, clear felling) and reforestation projects on all sites, will be implemented under a felling licence issued by the Department of Agriculture, Food & the Marine. Sediment traps will require monitoring and maintenance throughout the construction stage. Sediment traps will be constructed and maintained in line with the requirements of the Forest Road Manual and Forest Drainage Engineering – A Design Manual (Forestry Schemes Manual, 2011).	It is recommended that local surface water features at the proposed wind farm site are monitored pre-construction and during construction to take account of any variations in the quality of the local surface water environment as a result of activities related to the proposed wind farm site. A SWMP is included in Appendix 9-4. The main water parameters in terms of their potential to cause damage to aquatic life, ecosystems, human health, and water quality in the receiving waters are outlined in the proposed surface water monitoring schedule in Appendix 9-4. Inspections of silt traps are critical after prolonged or intense rainfall while maintenance will ensure maximum effectiveness of the proposed measures. Stockpiles will be evaluated and monitored and kept stable for safety and to minimise erosion. Turbidity monitors/alarms will be strategically placed 0.5km upgradient on the Holy Well Clohaskin River and 0.5km downgradient of works to assess the main construction works including bridge crossing



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
				and turbine base construction. Where elevated turbidity is noted both upstream and downstream, visual checks will be undertaken. All monitoring equipment will be calibrated regularly to ensure that results are accurately measured. Corrective Actions would include: Investigate whether channels used to convey water are protected with vegetation, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. Check all outlets and location of turbidity monitors. Stop dewatering if the downgradient area shows elevated turbidity or erosion. Control and the receiving water. Check outlet protection or a velocity dissipation device. Ensure a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment) in place at outlets.



Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
				Check for leaking pumps, hoses, and pipe connections and fix if identified. A programme of inspection and maintenance will be designed, and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed, and records kept. During the construction phase, field testing and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event based as appropriate).
26	Alteration of Groundwater Flow	EIAR Chapter 9	Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016). Groundwater from the borrow pits will be treated in the settlement ponds, see Drawing 11333-2061 to 11333-2074. At the Ballyloughane wells and along the GCR, an alternative supply to wells will be provided during the HDD works at W1 (HDD Crossing) – See Appendix 2-5 TLI Construction methodology (see Chapter 9) .	The dewatering operations will be inspected each day when dewatering water is ongoing to ensure that dewatering treatment controls are working correctly; to evaluate whether there are observable indicators of sediment discharges; Where any issues are encountered, action will be undertaken to correct any problems at the proposed project or with the dewatering controls that may have contributed to the discharges.

Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
				Regular monitoring of groundwater (levels and quality) will take place using existing monitoring boreholes during the construction phase. The Ballyloughane borehole abstractions will be monitored on site during construction and for a period following cessation of construction activities (to be agreed with the relevant authorities).
Noise & Vibration				
27	Construction Noise	EIAR Chapter 11	The contract documents will specify that the Contractor undertaking the construction works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration. To ameliorate any potential noise impacts that may present during the construction phase, a schedule of noise control measures has been formulated in accordance with best practice guidance, and the contract documents will require the Contractor to implement these measures.	
Archaeology and Cultural Heritage				
28	Archaeology	EIAR Chapter 13	All townland boundary interventions, route of the new access road along the TDR and the excavation of the GCR trench, where it passes to the west of AH109 required for the proposed project will be subject to archaeological monitoring. This work will be carried out under licence to the National Monuments Service of the DoHLGH and will include a full record of the sections of boundaries removed If any archaeological remains are identified further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHLGH. The section of demesne wall associated with Sharavogue House (DL12) will be cleared of vegetation prior to the commencement of construction and a full written and photographic	Archaeological monitoring during excavation works described and removal of the wall associated with Sharavogue House.

Ref No.	Related to	Location	Mitigation Measure	Monitoring Requirements
			record of the wall will be made. The removal of the wall will be subject to archaeological monitoring as described above. The wall will be reinstated following the completion of works.	



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