APPENDIX 4-4

CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

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1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been prepared by MKO on behalf of the Applicant, Bord na Móna Powergen Ltd (BnM), which intends to apply to An Coimisiún Pleanála (ACP) for planning permission to construct a renewable energy development which will comprise of 46 no. wind turbines and associated infrastructure in the townlands of Ballydermot, Co. Offaly and Lullybeg Co. Kildare and adjacent townlands. The Proposed Project will also comprise of 220kV grid connection infrastructure to connect to the national grid via loop-in from the existing Maynooth-Dunstown 220kV overhead line (OHL) in the townland of Killybegs in Co. Kildare.

As detailed in Section 1.1.1 in Chapter 1 Introduction, for the purposes of this Environmental Impact Assessment Report (EIAR), the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Enhancement Areas', 'Proposed Construction Haul Routes', 'Proposed Turbine Delivery Route', 'Project Site', 'Proposed Wind Farm', 'Proposed Turbines', 'Proposed Grid Connection', 'Proposed Onsite Substation' and 'Proposed Offsite Substation'. A detailed description of the Proposed Project is provided in Chapter 4: Description of the Proposed Project of this EIAR.

The CEMP has been prepared in conjunction with the EIAR and the Natura Impact Statement (NIS) which will accompany the planning application for the Proposed Project to the competent authority. Should the Proposed Project secure planning permission, the CEMP will be updated in line with all conditions and obligations which apply to any grant of permission. The CEMP should be read in conjunction with the EIAR, NIS and planning drawings. The CEMP will also require updating by the selected contractor in order to identify, assess and satisfy the contract performance criteria as set out by the various stakeholders. The CEMP due to its structure and nature will also require constant updating and revision throughout the construction period as set out below. Therefore, this is a working document and will be developed further prior to and during the construction phase of the Proposed Project.

Triggers for amendments to the CEMP will include:

- Response to any specific requirements arising from conditions attached to a grant of planning permission;
- When there is a perceived need to improve performance in an area of environmental impact;
- As a result of changes in environmental legislation applicable and relevant to the Proposed Project;
- Where the outcomes from auditing establish a need for change;
- Where Work Method Statements identify changes to a construction methodology to address high environmental risk; and
- As a result of an incident or complaint occurring that necessitates an amendment.

This CEMP identifies the key planning and environmental considerations that must be adhered to and delivered during site construction. The Contractor, which will be appointed by the Project Developer prior to commencement of construction, will be required to implement all of the requirements set out in this CEMP. The CEMP may be updated and revised throughout the construction phase of the Proposed Project, but all future iterations must meet or exceed the standards and requirements set out in this document and the Project Developer must be satisfied that all requirements set out in this document can and will be implemented in full by the appointed contractor.

The CEMP will be prepared by the appointed Contractor and will be a single, amalgamated document that can be used during the construction phase of the Proposed Project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, Developer and Contractors alike. The CEMP may evolve over further iterations as the construction works progress, but at all times must meet or exceed the standards and requirements set out in this document. It will be the Contractor's current version of the CEMP, which at any point in

time, will guide the construction activities on site and the implementation of which will be audited by an independent Environmental Clerk of Works (EnvCoW).

1.1 Statement of Authority

This CEMP has been prepared by Lakshmi Priya Mohan with input from Ciarán Fitzgerald, and reviewed by Catherine Johnson, Ellen Costello and Sean Creedon, all of MKO.

Lakshmi is an Environmental Scientist at MKO with over three years of consultancy experience. Lakshmi holds a master's degree in environmental science, a master's degree in Zoology and a bachelor's degree in Zoology. Prior to taking up her position with MKO in March 2026, Lakshmi worked as an Environmental Consultant in DNV, Ireland. Lakshmi has excellent report writing and research skills, experienced Production of EIARs, CEMPs, EIA Screenings, SEA Screening, GIS map outputs across various large infrastructure developments and land infill projects in Ireland.

Ciarán Fitzgerald is an Environmental Scientist who has been working with MKO since June 2024. Ciarán holds a B.Sc. (Honours) in Marine Science from the National University of Ireland Galway and a First-Class Honours PG. Dip in Geographic Information Systems from University College Cork. Ciarán works as part of the Environmental Renewables team as well as a larger multidisciplinary team. Ciarán's role involves undertaking tasks such as report writing, EIAR chapter writing, and QGIS mapping. Prior to joining MKO, Ciarán spent time aboard the research vessel "Celtic Explorer," working as part of a team undertaking chemical water data, pelagic species abundance and sorting, bathymetric GIS mapping, data collection, and report writing. Ciarán's key strengths lie in GIS mapping and communication. Since joining the company, Ciarán has been involved in a range of projects, including onshore wind, offshore wind, and solar, contributing by reviewing EIAR chapters and assisting with project development. Ciarán holds a membership from the Institute of Sustainability and Environmental Professionals (ISEP).

Catherine is a Project Environmental Scientist at MKO with over 4 years of consultancy experience in climate, renewable energy, and sustainability. Catherine possesses skills in mapping and design, which complement her experience in preparing comprehensive reports for EIAs. Catherine holds a BSc in Earth and Ocean Science and a LLM in Global Environment and Climate Change Law. Catherine has been involved in a myriad of environmental service offerings at MKO including EIA Screenings and Reports, climate and sustainability related work and renewable energy infrastructure projects, including both onshore and offshore wind energy developments.

Ellen Costello is a Senior Environmental Scientist with MKO with over 6 years' experience in private consultancy. Ellen holds a BSc (Hons) in Earth Science, and a MSc (Hons) in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on renewable energy development in Europe and its implications on environment and society. Ellen's key strengths and expertise are Environmental Protection and Management, Environmental Impact Statements, Project Management, and GIS Mapping and Modelling. Since joining MKO, Ellen has been involved in a range of renewable energy infrastructure projects. In her role as a senior project manager, Ellen works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments.

Sean is an Associate Director in the Environment Team at MKO. He oversees a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He is a member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Sean has over 23 years' experience in program and project development, holds an MSc

from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

1.2 Scope of the Construction and Environmental Management Plan

This CEMP is presented as a guidance document for the construction of the Proposed Project which will comprise 46 no. wind turbines, and associated infrastructure in the townlands of Ballydermot, Co. Offaly and Lullybeg Co. Kildare and adjacent townlands. The Proposed Project includes the Proposed Grid Connection comprising the Proposed Onsite Substation, Proposed Offsite Substation, the 13.1 km underground cabling connection from the Proposed Onsite Substation to the Proposed Offsite Substation, and OHL connecting to the existing Maynooth-Dunstown 220kV OHL, and all ancillary works and apparatus.

A detailed description of the Proposed Project is provided in Chapter 4: Description of the Proposed Project of the EIAR.

The CEMP is divided into ten sections, as outlined below.

Section 1 provides a brief introduction as to the scope of the report.

Section 2 outlines the Project Site and Proposed Project details, detailing the targets and objectives of this plan along with providing an overview of construction methodologies that will be adopted throughout the Proposed Project.

Section 3 sets out details of the environmental controls to be implemented on Project Site. Site drainage principles, traffic management, dust control, invasive species management and a resource and waste management plan are also included in this section.

Section 4 sets out a fully detailed implementation plan for the environmental management of the Proposed Project outlining the roles and responsibilities of the project team.

Section 5 outlines the general Health and Safety measures that will be implemented on site during the construction phase of the Proposed Project.

Section 6 outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection.

Section 7 consists of a summary table of all mitigation proposals to be adhered to during the Proposed Project, categorised into two separate headings, 1) pre-commencement measures; 2) construction-phase measures.

Section 8 consists of a summary table of all monitoring requirements and proposals to be adhered to during the Proposed Project, categorised into two separate headings, 1) pre-commencement measures; 2) construction-phase measures.

Section 9 sets out a programme for the timing of the works.

Section 10 outlines the proposals for reviewing compliance with the provisions of this report.

1.3 Targets and Objectives

The following key targets and objectives will inform the final detailed design should the Proposed Project secure planning permission and proceed to the construction phase. This includes consideration of the buildability of the designs that emerge:

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in the EIAR, NIS and associated planning documentation;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure construction works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to construction and, ensure sustainable sources for materials supply where possible; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows:

- Use recycled materials, if possible, e.g. excavated stone and overburden;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keep all watercourses free from obstruction and debris;
- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of construction to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment. Construction Methods and designs will be altered where it is found there is an adverse effect on the environment;
- Comply with all relevant water quality legislation listed throughout this document; and,
- Ensure a properly designed, constructed and maintained drainage system appropriate to the requirements of the Project Site is kept in place at all times.

2. SITE AND PROPOSED PROJECT DETAILS

2.1 Site Location

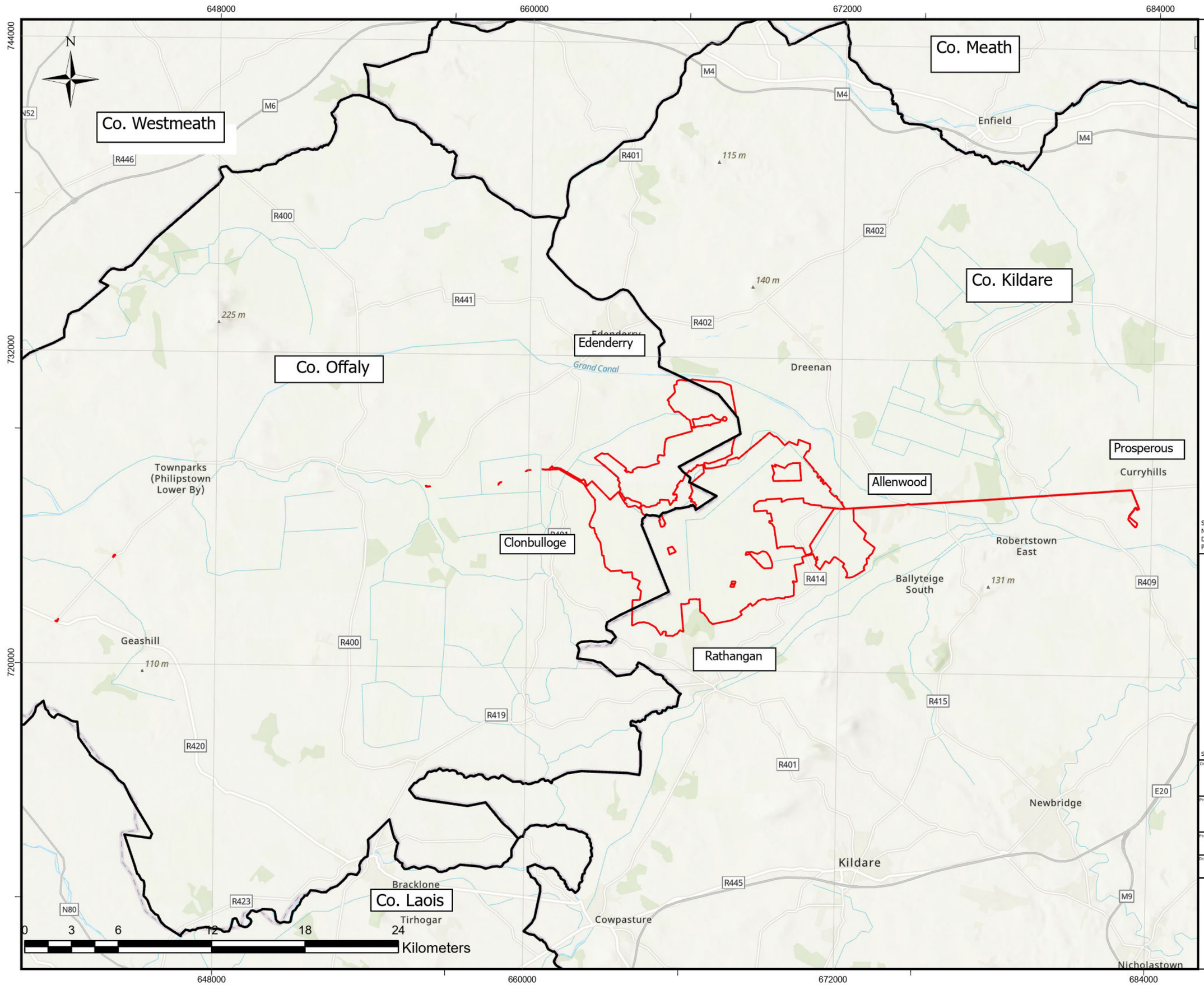
The Proposed Wind Farm is located approximately 2.2km south-southeast of Edenderry Co. Offaly, 3.3km west of Allenwood Co. Kildare, 2km north of Rathangan Co. Kildare and 1.7km east of Clonbullogue Village Co. Offaly. The Proposed Wind Farm will be located on part of the Allen Bog Group which comprises 14 no. bogs approx. 5580 ha. and is located on the border of County Offaly and County Kildare. The bogs include: Ticknevin, Glashabaun North, Glashabaun South, Codd 1, Codd 2, Ballydermot North, Ballydermot South, Blackriver, Lullymore, Lullybeg, Barnaran, Killina, Derrybrennan and Lodge. The Proposed Grid Connection will traverse through Allenwood, Co. Kildare and Prosperous, Co. Kildare, with infrastructure proposed in the townland of Lullymore and Killybegs, Co Kildare and adjacent townlands.

The approximate centre of the Project Site is X666946, Y725714 in Irish Transverse Mercator (ITM) coordinates. It is proposed to access the Project Site via 7 proposed access junctions. Of the 7 no. access junctions there are 12 no. associated site entrances, 10 no. of which are proposed to be used during the construction phase. Of these site entrances, 4 no. are existing access junctions that will be upgraded, and 8 no. are proposed new site entrances. Please see Section 4.5.1 of Chapter 4 Description of the Proposed Project for further information on site entrance. A site location context map is shown in Figure 2-1 below.

The Proposed Grid Connection will facilitate the connection of the Proposed Turbines to the national electricity grid. Underground electrical cables will transmit the power from each wind turbine to the Proposed Onsite Substation. The Proposed Onsite Substation will connect to the Proposed Offsite Substation via 13.1km of underground electrical 220kV cabling which will be primarily located in the public road network, with two subsections (0.5km and 1km) located in private land. The Proposed Offsite Substation will connect into the national grid via the existing Maynooth-Dunstown 220kV OHL in the townland of Killybegs, Co. Kildare, measuring approximately 0.12km in total length (comprising 0.06km of OHL loop-in from the Proposed Offsite Substation to the existing OHL). It is proposed to access the Proposed Onsite Substation via internal access roads during the construction and operation phases. The Proposed Offsite Substation and associated OHL cabling infrastructure will be accessed via a proposed new entrance off the L6002 near Prosperous Co. Kildare. Please see Section 4.5 of Chapter 4 Description of the Proposed Project of the EIAR for further information on site entrances.

Current land use within the area encompassing the Proposed Wind Farm, Proposed Enhancement Areas, the Proposed Onsite Substation, and 0.5km of (hereafter the Proposed Wind Farm site) natural revegetation of cutaway and degraded bog, public road corridor, and a small area of active turbary. Current land use on and along the Proposed Grid Connection comprises degraded raised bog, agricultural land, and public road corridor. Land-use in the wider landscape of the Project Site comprises of BnM landholdings, forestry, agricultural land, cutover and cutaway peatland, peatland rehabilitation, one-off rural housing, small village settlements, and existing energy infrastructure, including power plants, solar farms, and wind energy developments.

A full and detailed description of the Proposed Project for the purposes of the planning application and the additional elements that form part of the overall project, assessed in the EIAR, is contained in Chapter 4 Description of the Proposed Project of the EIAR. The townlands within which the Proposed Project is located are listed in Table 1-1 in Chapter 1: Introduction of the EIAR.

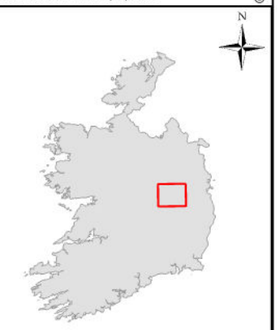


Legend

- Project Site
- County Boundaries

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

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SITE LOCATION - NOT TO SCALE

Drawing Title
Site Location Context

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-1	1:220,762
Drawn By	Checked By	Date
LPM	CJ	27/08/2026

MKO
Email: info@mkoireland.ie/ Website: www.mkoireland.ie

2.2 Description of the Proposed Project

This section of the CEMP describes the Proposed Project and all its component parts. The planning application for the Proposed Project will be made to ACP. A detailed description of the Proposed Project is provided in Chapter 4 Description of the Proposed Project of this EIAR.

The Proposed Wind Farm site layout is shown in Figure 2-2 below. The Proposed Grid Connection layout including Proposed Onsite Substation and Proposed Offsite Substation is illustrated on Figure 2-3. Figure 2-4 illustrates the Proposed Enhancement Area and Figure 2-5 shows the overall layout of the Proposed Project (i.e. the Proposed Wind Farm, Proposed Grid Connection, Proposed Enhancement Areas, Proposed Turbine Delivery Route and Proposed Construction Haul Routes).

Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 to Chapter 4 of the EIAR.

672000

N

Killane

Drumcooly

Ticknevin

Killinagh Lower

Allenwood South

Church Road

Clonbullogue

Woodlands

R401

R414

R442

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T34 T35 T36 T37 T38 T39 T40 T41 T42 T43 T44 T45 T46

0 1 2 4 6 8 Kilometers

Legend

- Project Site

Proposed Turbine Layout

- 220
- 200
- Proposed Relay Mast
- Proposed Met Mast
- Proposed Telecommunications Tower
- Proposed Internal 33kV Cabling
- Proposed Grid Connection Underground 220KV electrical cabling
- Temporary Construction Compounds
- Proposed Peat and Spoil Areas
- Proposed Security Hut
- Proposed Car parking
- Proposed Set Down Area
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Internal Access Road
- Upgrades to Existing Road
- Proposed Turning Bay
- Proposed Dedicated Amenity Track
- Proposed Dedicated Amenity Board Walk
- Proposed Dedicated Amenity Equestrian Track

Spatial Reference
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Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

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Drawing Title
Proposed Wind Farm Layout

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-2	1:70,000
Drawn By	Checked By	Date
TI	CJ	20/10/2026

MKO
Email: info@mkoireland.ie/ Website: www.mkoireland.ie

672000

672000

684000

N

R414

Hodgestown
(Clane By)

Coolearagh
East

gh Lower

Curryhills

Blackwood
(Clane By)

Allenwood
North

Allenwood
Middle

Allenwood
South

R403

Downings
North

Prosperous

R414

R409

R409

R409

Derrymullen

R415

Lowtown
(Connell By)

Robertstown
East

Grangeclare
West

Ballyteige
South

Kilmeage

0 0.75 1.5 3 4.5 6

Kilometers

684000

Legend

- Project Site
- Proposed Telecommunications Tower
- Joint Bays
- Existing OHL
- Proposed Internal 33kV Cabling
- Proposed OHL
- Proposed Grid Connection Underground 220KV electrical cabling
- Temporary Construction Compounds
- Proposed Offsite Substation Tower Build Area
- Proposed Offsite Substation Crane Pad
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Offsite 220kV GIS Substation
- Proposed Internal Access Track

Spatial Reference
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N

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Grid Connection Layout

Project Title

Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-3	1:60,000
Drawn By	Checked By	Date
LPM	CJ	30/09/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

672000

N

T32 T30 T31 T29 T27 T28 T23 T46 T45 T44 T24 T42 T26 T43 T25 T41 T22 T40 T39 T36 T37 T21 T20 T10 T38 T17 T35 T19 T09 T18 T07 T34 T16 T33 T06 T15 T01 T08 T11 T05 T03 T12 T13 T04 T02 T14

0 1 2 4 6 8 Kilometers

672000

Legend

- Project Site

Proposed Turbine Layout

- 220
- 200
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Scrub Mosaic Creation Area
- Killina Bog Offsetting Area
- Lodge Bog Enhancement Area
- Marsh Fritillary Enhancement Area
- Peatland Enhancement Area
- Pollinator Foraging Habitat Enhancement Area
- Native Tree (Woodland and Scrub) Planting Area

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Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title: Proposed Enhancement Area

Project Title: Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-4	1:70,000
Drawn By	Checked By	Date
LPM	CJ	15/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

660000

680000

740000

720000

N

Ballinagar

Kinnegad

Tolvaght

Edenderry

Dreenan

Townparks (Philipstown Lower By)

Geashill

Curryhil

Robertstown East

Ballyteige South

Newbridge

R400

R441

R442

R446

R148

R160

R402

R403

R414

R401

R409

R419

R415

0 3 6 12 18 24 Kilometers

Legend

- Project Site
- Proposed Turbine Layout
- 220
- 200
- Proposed Relay Mast
- Proposed Met Mast
- Proposed Telecommunications Tower
- Joint Bays
- Existing OHL
- Proposed Internal 33kV Cabling
- Proposed OHL
- Proposed Grid Connection Underground 220KV electrical cabling
- Proposed Construction Haul Routes
- Proposed Turbine Delivery Route
- Temporary Construction Compounds
- Proposed Peat and Spoil Areas
- Proposed Security Hut
- Proposed Car parking
- Proposed Set Down Area
- Proposed Offsite Substation Tower Build Area
- Proposed Offsite Substation Crane Pad
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Offsite 220kV GIS Substation
- Proposed Internal Access Road
- Upgrades to Existing Road
- Proposed Turning Bay
- Proposed Dedicated Amenity Track
- Proposed Dedicated Amenity Board Walk
- Proposed Dedicated Amenity Equestrian Track
- Proposed TDR Accommodation Area

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title: Proposed Project Layout

Project Title: Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-5	1:210,000
Drawn By	Checked By	Date
LPM	CJ	02/10/2026

MKO
Email: info@mkoireland.ie/ Website: www.mkoireland.ie

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2.3 Construction Management Practices Overview

2.3.1 Introduction

An experienced principal contractor will be appointed for the civil works for the construction phase of the Proposed Project. The appointed contractor for the works will be required to comply with this CEMP and any revisions made to this document in the preparation of method statements for the various elements of the construction phase of the Proposed Project. An overview of the proposed Construction Management Practices is provided below.

2.3.2 Overview of Proposed Construction Management Practices

The EIAR includes construction methodologies and management practices for various elements of work to be undertaken as part of the Proposed Project. Detailed construction methodologies are reproduced in the relevant sub-sections but will be superseded by an appointed contractor's construction method statements, which will form part of the CEMP. The following sections also outline the construction and environmental management practices to be deployed during the construction phase. The contractor's construction method statements will be prepared to take account of the detailed engineering, geotechnical and detailed drainage design which will be prepared prior to commencement of construction and all requirements of this CEMP.

Proposed Wind Farm

- Turbine Foundations;
- Hardstanding Areas;
- Assembly Areas;
- Site Roads (New and Upgrade to Existing Access Track) and Crane Pad Areas;
- Access Junctions;
- Site Underground Electrical (33kV) and Communications Cabling;
- Cable Trenching;
- Site Entrance Management;
- Anemometry Mast;
- Relay Mast;
- Met Mast:
- Temporary Construction Compounds;
- Temporary Security Compounds and Gates;
- Biodiversity Offsetting and Enhancement Measures;
- Amenity Tracks and Carparks.
- Clear-Felling Forestry and Afforestation / Vegetation Removal;
- Site Drainage System;
- Watercourse/Culvert Crossings;
- Peat and Spoil Areas;
- Proposed Turbine Delivery Route Accommodation Works;

Proposed Grid Connection

- Proposed Onsite Substation (comprising one 220kV Gas-Insulated Substation (GIS) building, and one 110kV Gas-Insulated Substation (GIS) building, one control building, and a telecommunications tower);
- Proposed Offsite Substation (comprising one 220kV GIS building, one telecommunications tower, 2 no. steel masts, 2 no. new gantry structures)

- 220kV OHL Electrical Cabling Route;
- 13k.1 m of 220kV underground electrical cabling route

2.3.3 Proposed Wind Farm

2.3.3.1 Turbine Foundations

Each wind turbine will require either piled foundation or a gravity foundation of reinforced concrete bearing onto rock or other competent substrata with a central upstand to support the tower. The size of the foundation will be designed by the appointed Civil Designer and dictated by the turbine manufacturer, with the final turbine selection being the subject of a competitive tender process. Adopting a precautionary approach, however, a circular in plan foundation area large enough to accommodate modern turbine models has been assessed in the EIAR. Piled and gravity foundation bases are generally ca. 30 m in diameter with the detailed foundation design being dictated by the local ground conditions. The vertical extent of the turbine foundation will be ca. 4 m, which has been assessed in the EIAR.

Turbine foundations are constructed by excavating peat and spoil to suitable sub-formation level. Imported structural fill and blinding is placed and compacted to formation level. A reinforced concrete base is cast in-situ. The turbine foundation transmits any load on the wind turbine into the ground (refer to Section 4.4.1.1 of Chapter 4 of the EIAR). Piling depths will depend on site conditions. These will be established by detailed post-consent geotechnical investigations. Pre-construction final design will be carried out after post-consent geotechnical investigations have been completed. Additional geotechnical investigations will be undertaken at each turbine location with associated sampling and laboratory testing.

After the foundation level of each turbine has been formed using piled foundations or a gravity foundation on competent stratum (i.e., bedrock or subsoil of sufficient load bearing capacity), the “anchor cage” (which anchors the first section of the turbine tower to the foundation) is levelled and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered using either permanent lightweight formwork using corrugated sheeting, or temporary demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to the finished surface level.

It is anticipated that the formation level of the turbine foundations will be on the lower mineral subsoil or bedrock. They will be formed at a suitable level directed by the Geotechnical Engineer/Designer. The foundations will be constructed as follows:

1. *The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter;*
2. *Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished turbine;*
3. *No material will be removed from the Proposed Wind Farm with excavated peat and spoil being transported to the identified peat and spoil areas within the Project Site.*
4. *All groundwater and surface water arising from turbine base excavation will be pumped to the dirty water system prior to discharge from the works area;*
5. *Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light;*
6. *The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the turbine foundation.*

Standard excavated reinforced concrete bases will be completed as follows:

1. *The concrete should be protected from rainfall during curing and all surface water runoff from the curing concrete should be prevented from entering surface water drainage directly;*
2. *High tensile steel reinforcement will be fixed around the anchor cage in accordance with the designer's drawings & schedules. The foundation anchorage system will be installed, levelled and secured to the blinding using steel box section stools;*
3. *Ductwork will be installed as required, and formwork erected around the steel cage and propped from the backside as required;*
4. *The foundation anchorage system will be checked both for level and line prior to the concrete being installed in the base. These checks will be passed to turbine manufacturer for their approval;*
5. *Concrete will be placed using a concrete pump and compacted when in the forms using vibrating pokers to the levels and profile indicated on the drawings. Upon completion of the concreting works the foundation base will be covered and allowed to cure;*
6. *Steel shutters will be used to pour the circular chimney section;*
7. *Earth wires and drainage pipes will be placed around the base;*
8. *The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation or imported material and landscaped using the soil set aside during the excavation; and.*
9. *No excavated material will be removed from the Proposed Wind Farm site with excavated peat and spoil being transported to the identified peat and spoil areas within the Project Site.*

Reinforced concrete piled foundations will be completed as follows:

1. *The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter;*
2. *No excavated material will be removed from the Proposed Wind Farm site with excavated peat and spoil being transported to the identified peat and spoil areas within the Project Site.*
3. *A piling platform for the piling rig will be constructed by excavating to a suitable intermediate mineral subsoil and backfilling to formation level by compacted layers of well graded granular material spread and compacted to provide a hard area for the piling rig;*
4. *The piling rig, fitted with an auger, will then bore through the soft material with a sleeve fitted around the auger to prevent the sidewalls of the soil and overburden from collapsing. The borehole is then extended to a suitable depth into the subsoil/bedrock.*
5. *When the auger and the sleeve are removed high tensile steel cages will be lowered into the boreholes. These steel cages will extrude above the level of the top of the concrete pile.*
6. *As the auger is removed concrete is pumped into the borehole.*
7. *Reinforcing steel on the top of the pile will tie to the foundation base steel.*
8. *The procedure for standard excavated reinforced concrete bases as outlined above can be applied from here.*

2.3.3.2 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine. The hardstands also allow for the offloading and storage of turbine components, and provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads detailed in Section

2.3.3.4.2 below and will measure 51m by 108m, with ancillary crane pads measuring 15m by 15m, boom support pads of 7m by 7m and blade storage areas are 5.5m by 21m.

The hardstanding areas shown represents a design based on manufacturer's requirements and seeks to accommodate a number of different turbine types and models.

The proposed hard standing areas for each individual turbine are shown as part of the detailed layout drawings included in Appendix 4-1 to Chapter 4 of the EIAR and using the precautionary principle, represent the largest proposed infrastructure footprint required.

Figure 4-6 of Chapter 4 shows a piled turbine base layout, Figure 4-7 of Chapter 4 shows a bored turbine base layout and Figure 4-8 of Chapter 4 shows a gravity turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area.

2.3.3.3 Assembly Areas

The assembly areas will be located on the hard-standing area as shown in Figure 4-6, Figure 4-7 and Figure 4-8 in Chapter 4 of the EIAR. These assembly areas are required for offloading turbine blades, tower sections and hub from trucks until such time as they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The extent of the area required for the assembly areas is shown in Figure 4-6 Figure 4-7 and Figure 4-8 in Chapter 4 of the EIAR and the detailed drawing in Appendix 4-1 of the EIAR.

2.3.3.4 Site Roads

To provide internal access within the Proposed Wind Farm and to connect the Proposed Turbines and associated infrastructure, existing internal tracks will need to be upgraded, and proposed internal site access roads will need to be constructed. The Proposed Project will have approximately 65.1 kilometres (km)of internal access roads, this includes 64.1km for the Proposed Wind Farm site and 1km for the Proposed Offsite Substation. The road construction techniques to be considered are as follows:

- Construction of New Floating Roads over peat;
- Construction of New Excavated Roads through peat, and;
- Upgrades to Existing Track – Floated Road.

The proposed internal site access roads will be constructed using the methodology summarised below:

2.3.3.4.1 *Construction of New Floating Roads*

Approximately 60km of new roads will be constructed in order to facilitate the Proposed Wind Farm site and Proposed Offsite Substation construction; approximately 58.5m being new floating roads. Sections of new floating tracks are shown in Figure 4-9 of Chapter 4 of the EIAR.

The construction methodology for the construction of floating roads, as presented in the *Peat and Spoil Management Plan* (Appendix 4-3 of the EIAR) is detailed below. This methodology includes procedures that are to be included in the construction to minimise any adverse impact on peat stability.

1. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2.5m and will be at locations agreed between the Project Geotechnical Engineer and the Contractor.*
2. *Base geogrid will be laid directly onto the existing peat surface along the line of the road in accordance with geogrid provider's requirements.*
3. *Construction of the road will be in accordance with an appropriate design from the designer.*

4. *The typical make-up of the new floated access road is 800mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator (drawing P2319-0600- 0022).*
5. *Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2024).*
6. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
7. *The finished road width will have (5.5m running width), with wider sections on bends and corners.*
8. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will be avoided.*
9. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
10. *Where it is not possible to end-tip over a 10m length of constructed floating road then dumpers delivering stone to the floating road will carry a reduced stone load (not greater than half full) until such time as end-tipping can be carried out over a 10m length of constructed floating road.*
11. *Following end-tipping a suitable bulldozer will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
12. *A final surface layer will be placed over the full width of the floating road, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
13. *The construction and upgrading of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.*

2.3.3.4.2 Construction of New Excavated Roads

The construction methodology for the construction of new excavated access roads, as presented in the *Peat & Spoil Management Plan* in Appendix 4-3 of the EIAR, is detailed below.

1. *Prior to commencing the construction of the excavated roads, movement monitoring posts will be installed in areas where the peat depth is greater than 2.5m, and in areas identified within the peat stability risk assessment as requiring monitoring.*
2. *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
3. *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
4. *Road construction will be carried out in sections of approximately 20m lengths i.e. no more than 20m of access road should be excavated without re-placement with stone fill.*
5. *Once excavated, peat will be side-cast locally to the excavation or within the designated peat and spoil areas.*
6. *Excavation of materials with respect to control of peat stability:*
    a) *Acrotelm (to about 0.3 to 0.4m of peat) is generally required for landscaping and will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
    b) *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
    c) *All catotelm peat (peat below about 0.3 to 0.4m depth) will be transported immediately on excavation to the designated peat and spoil areas.*

7. *Once excavated, non-catotelm peat will be temporarily stored in localised areas adjacent to excavations for roads and hardstands before being placed into the peat and spoil areas or reused for landscaping purposes. All peat and spoil areas will be inspected by the Project Geotechnical Engineer before material is stored in the area*
8. *Excavation side slopes in peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
9. *The excavated internal access road will be constructed with a minimum of 800mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600.*
10. *The finished road width will have a running width of 5.5m, wider sections on bends and corners where required*
11. *Internal access roads will be finished with a layer of Cl 804/UGM across the full width of the road.*
12. *A layer of geogrid/geotextile may be required at the surface of the competent stratum, where this stratum is cohesive in nature.*
13. *At transitions between floating and excavated roads a length of road of about 10m will have all peat excavated and replaced with suitable fill. The surface of this fill will be graded so that the road surface transitions smoothly from floating to excavated road (P2319-0600-0023).*
14. *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1.5m) and where it is proposed to construct the access road perpendicular to the slope contours it is best practice to start construction at the bottom of the slope and work towards the top, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability.*
15. *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*
16. *The construction and upgrading of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.*

Section details of New Excavated Roads are shown in Figure 4-10 of Chapter 4 of the EIAR.

2.3.3.4.3 Upgrade of Existing Tracks- Floated Road

The construction methodology for the upgrades of existing internal access roads, as presented in the *Peat & Spoil Management Plan* in Appendix 4-3 of the EIAR, is detailed below.

1. *For upgrading of existing track - floated road constructed using a floated construction technique (Type A – Drawing P2319-0600-0021) the following will apply:*
    a) *Prior to commencing floating road upgrades, movement monitoring posts will be installed in areas where the peat depth is greater than 2m and will be placed as described in Section 11.*
    b) *Construction of upgraded existing track- floated road will be in accordance with appropriate design from the designer.*
    c) *The surface of the existing track- floated road will be graded/tidied up prior to the placement any geogrid/geotextile (to prevent damaging the geogrid/geotextile).*
    d) *Where granular fill has been used in the existing track- floated road make-up, a layer of geogrid will be placed on top of the existing track- floated road.*
    e) *The basal geogrid on the widened section will be overlaid with an average of 800mm of selected granular fill.*

f) *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track- floated road (to be confirmed by the designer).*
g) *Stone delivered to the upgrades of existing track – floated road will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
h) *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
i) *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 5.5m wide pressure berm (1.0m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
j) *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*

2. *The finished road width will have a running width of 5.5m, with wider sections on bends and corners where required.*
3. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road.*
4. *A final surface layer shall be placed over the existing access road, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
5. *The upgrade of existing track – floated road in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads*

The section of road undergoing upgrades is shown in Figure 4-10 of Chapter 4 of the EIAR.

2.3.3.5 Site Underground Electrical and Communication Cabling

Each turbine will be connected to the Proposed Onsite Substation via underground 33kV electricity cabling. Fibre-optic cables will also connect each Proposed Turbine, the proposed met masts, and the proposed relay mast to the Proposed Onsite Substation. The electricity and fibre-optic cabling connecting to the Proposed Onsite Substation will be run in cable ducts adjacent to the proposed internal roads and buried directly alongside the internal roads at depths of approximately 1m below ground level to the top of the duct. After the ducts are laid the excavated material will be reinstated over the ducts. The cables will follow the access roads to each Proposed Turbine location and are illustrated on the site layout drawings included as Appendix 4-1 of Chapter 4; the exact number and configuration of cable may vary within the cabling trench. Figure 4-12 in Chapter 4 shows the proposed cable trench for 33kV cable trenches proposed within the Project Site. Please see Appendix 4-1 of Chapter 4 Planning Drawings for further detail on the location for the cable trench. The exact configuration and exact location of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

Backfill material will be compacted in layers with engineer-approved specified material, which may be imported onto the Project Site should sufficient volumes of suitable material not be encountered during the construction phase of the Proposed Project.

2.3.3.6 Site Entrance Management

The Project Site is currently served by a number of existing tracks and access roads due to its previous use as a commercial bog. As part of the Proposed Project, it is proposed to upgrade 4 no. existing entrances and facilitate 8 no. new site entrances.

Due to the nature of the Proposed Project, all proposed works will be local to the Project Site and as such, the construction phase will utilise 7 no. access junctions to facilitate delivery of materials and turbine components. Of the 7 no. access junctions and 12 no. site entrances, there are 10 no. associated site entrances proposed to be used during the construction phase. Please see Table 4-7 of Chapter 4 of the EIAR for further detail.

All proposed site entrances were subject to a swept path analysis assessment to identify the turning areas required, as described in Section 15.1 of Chapter 15 Material Assets –Traffic and Transport. Appropriate sightlines will be established for the safe access and egress of traffic.

It is anticipated that engineering fill and high-quality surfacing granular fill and sand will be sourced from local, authorised quarries. Please see Section 4.5.2 of Chapter 4 for further details on the Proposed Construction Haul Routes of these materials and the corresponding construction phase site entrance that would be utilised by heavy goods vehicles (HGVs) from each relevant quarry for access to the Project Site.

2.3.3.7 Meteorological Masts

There are 2 no. permanent meteorological mast (met mast) proposed as part of the Proposed Project. The met masts will be equipped with wind monitoring equipment at various heights. The met masts will be located within the Proposed Wind Farm ITM X 664363, Y723502 (Met Mast 1) and at ITM X667735, Y726740 (Met Mast 2), as shown on the site layout in Figure 4-1 of Chapter 4 of the EIAR and will be a slender structure of 40 metres in height. Each mast will be a free-standing structure and will be constructed with a reinforced concrete gravity foundation measuring 10m by 10m, designed to cater for the mast loadings. A hard-standing area measuring 40m by 20m to accommodate the installation crane will be constructed adjacent to an existing internal road. The design of the proposed anemometry masts is shown in Figure 4-13 and Figure 4-14 of Chapter 4 of the EIAR.

The met masts foundation will be formed at a suitable level directed by the Project Geotechnical Engineer. The foundation area will be prepared as follows:

1. *The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter;*
2. *Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished met mast;*
3. *No material will be removed from Project Site with excavated spoil being transported and stored in the identified spoil management areas within the Project Site.*
4. *All groundwater and surface water arising from met mase base excavation will be pumped to the dirty water system prior to discharge from the works area;*
5. *Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light;*
6. *The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the met mast foundation.*

The met mast foundation will then be installed using the standard excavated reinforced concrete bases methodology as detailed in Section 2.3.3.1.

2.3.3.8 Temporary Construction Compounds

There are 10 no. temporary construction compounds proposed as part of the Proposed Project, of which 9 no. will be located within the Proposed Wind Farm site and 1 no. within private land containing the Proposed Offsite Substation, listed in Table 4-2 of Chapter 4 of the EIAR. The

temporary construction compounds are strategically situated to facilitate works during the construction phase of the Proposed Project. The varying sizes of the temporary construction compounds are identified in Table 4-2 of Chapter 4 of the EIAR and will be used over various durations during the Proposed Project construction phase.

The locations of the proposed 10 no. temporary construction compounds are Glashabaun North Bog, Codd 1 Bog, Glashabaun North Bog and Glashabaun South Bog in Co. Offaly and Barnaran Bog, Ballydermot North Bog, Lodge Bog, Ballydermot South Bog, Blackriver Bog and Killybegs in Co. Kildare.

The construction compounds will be constructed using floated or excavate and replace methods pending the results of the detailed ground investigations. The construction methodology for the temporary construction compounds is as follows:

1. *The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter. (refer to Section 3.2 below);*
2. *The compound will be established using a similar technique as the construction of floated roads or as excavated roads as discussed below;*
3. *A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well-graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers.*
4. *A limited amount of fuel will have to be stored on the Project Site and for the grid connection in appropriately bunded containers, a bunded area for oil storage will be constructed within the compound.*
5. *Areas within the compound will be constructed as site roads and used as vehicle hard standings during deliveries and for parking;*
6. *A waste storage area will be provided within the compound;*
7. *The compound will be fenced and secured with locked gates if necessary.*

The 10 no. temporary construction compounds will be removed following construction and reinstated with previously excavated peat and spoil and left to revegetate naturally or be reseeded.

2.3.3.9 Temporary Security Cabins and Proposed Gates

During the construction phase, 10 no. temporary security cabins will be installed within the Project Site for the duration of the construction phase (please see Table 4-7 of Chapter 4 of the EIAR for detail on each site entrance location and for the location of each security cabin). The security cabins will be located close to the proposed construction site entrances and at crossing points on local roads from one bog to another.

The security cabins will be prefabricated structures measuring approximately 9 metres by 2.4 metres and 2.6 metres in height. The security cabins will serve as the check in and check out point for staff and visitors during the construction phase. At the end of the construction phase, the temporary security cabins will be removed from the Project Site and reinstated, then either reseeded or allowed to naturally revegetate. The layout and sections of the proposed security cabins is shown in Figure 4-25, and the locations are shown in Figure 4-1 of Chapter 4 of the EIAR.

During the construction phase, each temporary security cabin will have gates installed which will be manned by security stationed within each temporary security compound. Upon completion of construction and commissioning, a permanent gate will be installed at all operational phase entrances. Each gate will be fitted with a locking mechanism and will be used in the operational phase for amenity, maintenance and monitoring activities (see Table 4-7 of Chapter 4 of the EIAR).

2.3.3.10 Clear-Felled Forestry and Vegetation Removal with Associated Replanting

Tree Felling

Clear-felled tree felling will be required within and around the Proposed Project footprint to allow for the construction of the turbine bases, access roads, underground cabling, and other ancillary infrastructure and Proposed Enhancement Areas.

A total of 60.7ha of forestry (comprising conifer plantation (WD4) will be permanently clear-felled within and around the Proposed Wind Farm site.

The felling activities required as part of the Proposed Project will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The Forest Service policy requires that planning permission for the Proposed Project is available prior to determination of the associated felling licence application. Where replacement afforestation is required by the Forest Service as part of the felling licence process, the replacement afforestation lands will also be subject to the applicable statutory forestry consent process.

The Forestry Service's Felling and Reforestation Policy provides for circumstances in which permanent forest removal may be permitted without a requirement for alternative afforestation, including where deforestation is justified by overriding environmental considerations and conversion to open habitat is necessary to benefit the habitat or species concerned. In the case of the Proposed Project, 60.7ha of permanent forestry removal will be felled to accommodate the ornithological enhancement and offsetting and biodiversity enhancement (i.e., the Proposed Enhancement). The applicability of this provision to the Proposed Project will ultimately be a matter for determination by the Forestry Service through the relevant felling licence process. Accordingly, the EIAR does not assume that an exemption will apply and, on a precautionary basis, assesses the position on the basis that replacement afforestation is required. Please see Section 4.4.3 of Chapter 4 and Chapter 6 Biodiversity and Appendix 6-5 of the EIAR for details.

Replacement Afforestation

In line with the Forest Service's published policy on felling for wind farm developments, areas cleared of forestry for access roads, and any other wind farm-related uses will have to be replaced by replanting at an alternative site or sites.

The estimated 60.7ha that will be permanently clear-felled for the footprint of the Proposed Project infrastructure will be replaced or replanted. Replanting is a requirement of the Forestry Act and is primarily a matter for the statutory licensing processes that are under the control of the Forest Service.

The replacement of the 60.7ha of forestry can occur anywhere in the State subject to licence. The replacement of forestry, felled as part of the Proposed Project, may occur on any lands, within the state, benefitting from Forest Service Technical Approval[1] for afforestation, should the Proposed Project receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development,

[1] *All proposed forestry developments where the area involved is greater than 0.1 hectare must receive the prior written approval of the Forest Service. The application for approval is known as Pre-Planting Approval – Form 1.*

individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Habitats purposes).

The specific lands on which any such replacement afforestation would occur have not been identified at this stage. On a precautionary basis, the Applicant commits that, where replacement afforestation is required, the replacement afforestation lands will be located at least 10km from the Proposed Wind Farm and will not be located where there is a hydrological pathway through which the afforestation works could give rise to cumulative effects with the Proposed Project.

Further details in relation to clear-felled forestry replanting and cumulative assessment are included in Section 2.10.2.6 of Chapter 2 and Appendix 2-3 of the EIAR

2.3.3.10.2 *Vegetation Removal*

As part of the Proposed Project, bog woodland (WN7) and scrub (WS1) will be required to be removed (hereafter referred to as vegetation removal) within and around the footprint of the Proposed Wind Farm and Proposed Onsite Substation and other ancillary infrastructure and Proposed Enhancement Areas.

The estimated 173.27ha of vegetation to be removed within and around the Proposed Project, along with existing treeline boundaries is not subject to a Felling Licence from the Forestry Service and will be replanted within the Proposed Wind Farm site as part of the Proposed Enhancement Areas. Please see Section 4.4.3 below and Chapter 6 Biodiversity and Appendix 6-5 for details.

2.3.3.11 Amenity Track and Carparks

Internal Amenity Tracks

The internal amenity tracks are discussed and shown in the Ballydermot Amenity Plan which is contained in Appendix 4-2 to Chapter 4 of the EIAR and are illustrated in Figure 4-27 of the EIAR.

The Proposed Project includes 55.2 km of amenity track. This includes:

- 13.4km of a new dedicated internal amenity access track
- 40km of proposed internal site access road
- 8.5km equestrian loop for equestrian users only – this loop will overlap with proposed internal site access road for approximately 7.5km
- 0.844km (844m) of amenity board walk

These amenity tracks will provide amenity access opportunities, facilitate a variety of walking loops, enhance connectivity with local roads and existing off-site amenities, and provide local access to the Proposed Wind Farm. The amenity track proposed will enable the Proposed Wind Farm to provide connectivity to the surrounding settlements and sites / areas of interest. These include the towns / villages of Edenderry, Allenwood, Lullymore, Rathangan and Clonbullogue.

The 13.4km of new dedicated internal amenity access track and 1km of dedicated equestrian amenity track will have a gravel/crushed stone finish surface and will be approximately 3m in width and will be constructed using a similar methodology to the proposed new excavated roads as outlined in Section 2.3.3.4.2 above.

Approx 844m of the amenity tracks, known as board walkway, will be located above raised bog and will be constructed as a boardwalk. This work will include the following steps:

1. *All construction activities will use methods that minimise impact on the raised bog, preserving hydrology and vegetation.*

2. *Initial access will be planned to avoid damage to sensitive areas in collaboration with the environmental clerk of works*
3. *Temporary routes will be minimised and controlled.*
4. *The boardwalk will be supported on timber piles.*
5. *Piles will be driven into position by hand or using lightweight/low pressure mechanical means to reduce ground disturbance.*
6. *A timber deck will be laid on the installed piles section by section.*
7. *Modular or prefabricated sections will be used where possible to reduce time on site and insitu works.*
8. *Plant and personnel will use where possible completed sections of the boardwalk to access the next work area, avoiding direct contact with the bog surface.*
9. *FSC-certified timber and non-toxic treatments will be used to ensure sustainability and durability.*
10. *Only low-impact tools and machinery will be permitted.*
11. *All plant and equipment will be inspected before attending site for leaks and fitness of purpose to confirm there are no oil leaks or other defects that could pose a risk an environmental risk*
12. *Spill kits will be available at all times; no fuel or chemicals stored on the bog and refuelling to take place away from the raised bog area in a designated refuelling area.*
13. *All waste will be removed from the raised bog area daily, no disposal on Project Site.*
14. *Continuous checks will ensure compliance with environmental guidelines and safety standards.*

Seating areas and detailed site signage will be present throughout the Proposed Wind Farm, please see Appendix 4-2 of the EIAR for further detail.

Amenity Car Parks

As part of the Proposed Wind Farm, 4 no amenity car parks are proposed to facilitate amenity access to the Proposed Wind Farm during the operational phase.

The construction methodology is as follows:

- The area to be used for the car park will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter.
- The platform will be established using a similar technique as the construction of the substation platform as discussed in Section 4.9.2.1 of Chapter 4 of the EIAR.
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well-graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers.

Please see section 4.4.1.9 of Chapter 4 of the EIAR for further detail on amenity at the Proposed Wind Farm.

2.3.3.12 Site Drainage System

The existing drainage system and surface water discharges from the Project Site are regulated by the EPA (Licence Ref. P0503-01). The Proposed Wind Farm is located within a former peat extraction site. An extensive network of drainage channels is present throughout the peatland which is managed under IPC licence P0503-01 Allen Bog Group.

The drainage layout for the construction phase of the Proposed Project has been designed to collect surface water run-off from hardstanding areas within the Proposed Wind Farm site and discharge to temporary construction settlement ponds prior to entering existing IPC licensed drainage system.

Therefore, any surface water from the proposed works that finds its way into the existing drainage system will then be captured in the existing system of IPC silt / settlement ponds, before final discharge to the receiving watercourse. The existing IPC silt / settlement ponds are upstream and downstream of the external pumping stations to allow sediment to settle out of the water before it is discharged to the external streams.

The key principles of drainage design that will be implemented and adhered to as part of the Proposed Project are as follows:

- Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge/recharge to ground.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas.
- There is no direct hydraulic connectivity from proposed construction areas to natural watercourses or drains connecting to downstream watercourses.
- Maintain the existing hydrology/hydrogeology of the Project Site.
- Re-routing existing local drainage pathways as required.
- Weekly inspection and recording of surface water management system by on-site EnvCoW and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Project Site.

The EIAR (and appended drawings) includes a drainage design required for the purposes of assessing the potential effects of the Proposed Project. The drainage design will be developed further with a level of construction detail necessary to implement the measures onsite. The detailed (construction phase) drainage design will form part of the updated Main Contractor's CEMP, and the effective implementation of the detailed drainage design will be audited by the EnvCoW. Surface water management and drainage design principles are outlined in Section 3.2 below and Section 4.7 of Chapter 4 the EIAR.

2.3.3.13 Watercourse/Culvert Crossings

Within the Proposed Wind Farm, there are a total of 15 no. watercourse crossing locations over natural watercourses (rivers and streams). There are two proposed crossing locations over the Figile River, and both will be constructed as clear-span crossings. Existing bridges are currently in place at these locations; these will be dismantled and replaced as part of the Proposed Wind Farm. Further details regarding the methodologies are available in Section 4.9.1.7 of Chapter 4.

672000

N

R441

Drumcooly

Ticknevin

R403

Killinagh Lower

R401

Church Road

Clonbullogue

R442

R414

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T37 T38 T39 T40 T41 T42 T43 T44 T45 T46

0 0.75 1.5 3 4.5 6

Kilometers

672000

Legend

- Project Site
- Turbine Layout
  - 220
  - 200
- Streams
- Rivers
- Watercourse Crossings

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Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title
Watercourse Crossings within the Proposed Wind Farm site

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	2-6	1:65,000
Drawn By	Checked By	Date
LPM	CJ	28/09/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

2.3.3.13.1 Clear-Span Crossing

There will be 5 no. watercourse crossings will be upgraded with a clear span bridge. There are existing clear-span bridges present at 2 no. location that will be demolished prior to the construction of the new proposed clear-span crossings. Watercourse crossings methodologies are outlined in Section 4.9.1.7 in Chapter 4 of the EIAR

- **Proposed Wind Farm Crossing 4** (X663544, Y726783): Existing crossing to be demolished and replaced with a clear span bridge
- **Proposed Wind Farm Crossing 7** (X666745, Y727788): Existing crossing to be demolished and replaced with a clear span bridge
- **Proposed Wind Farm Crossing 9** (X666785, Y725833): Proposed new crossing via clear span bridge / bottomless culvert
- **Proposed Wind Farm Crossing 10** (X667679, Y 725577): Proposed new crossing via clear span bridge / bottomless culvert
- **Proposed Wind Farm Crossing 11** (X667101, Y725097): Proposed new crossing via clear span bridge / bottomless culvert

The demolition methodology is as follows:

1. *Prior to any works commencing, Inland Fisheries Ireland (IFI) will be consulted to inform detailed design of the demolishing of the existing Clear-Span Watercourse Crossing structure.*
2. *These works will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "Guidelines on protection of fisheries during construction works in and adjacent to waters", i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);*
3. *Timing of these works will be planned based on expected weather within the optimum period of July to September, ground conditions and current flow in the drainage ditch, to minimise construction period and disturbance to any potential downstream aquatic environment.*
4. *The Project Engineer will set out the works area and silt fencing will out erected at run-off areas adjacent to the works area.*
5. *The works area will be fenced off with post and rope to demarcate the works area. Prior to any works taking place, the area will be CAT scanned to identify any potential unknown underground services.*
6. *Oil booms will be established both upstream and downstream of the works and spill kits, inclusive of oil-only absorbent booms, will be required on both banks of the stream*
7. *The centre line of the new clear span crossing will be set out by the engineer on both upstream and downstream sides*
8. *The topography and ground conditions will be reviewed at the location. Safe access will be provided for all operatives. This may involve the creation of ramps, temporary walkways etc.*
9. *Pumping equipment will be set up at the upstream end of the works area. The hose will have a suction head fitted which will reduce the possibility of any aquatic species that may be present being sucked into the pump. Additionally, the hose will be positioned to one side of the channel and surrounded by clean stone offering further protection. The delivery hose shall be laid out across the road, which shall discharge, re-entering the watercourse downstream of the works area on the opposite side of the road.*
10. *The delivery line may need to be undergrounded across the access track to allow site traffic to access the works area.*

11. *A dam will be constructed at the upstream end by an excavator placing impermeable 1m3 sandbags within the drainage channel. These can be supplemented with smaller sandbags to plug any gaps.*
12. *Water will be allowed to partially self-empty from the isolated section. If the drainage channel is deemed to be fisheries sensitive, a smaller dam will then be placed at the downstream end before the section completely empties out and further consultation with IFI in relation to electrofishing and determining the presence of fish will be carried out. Once the presence of fish has been ruled out, the section can be fully dewatered. A pump may be used to aid this if necessary.*
13. *Water will be over pumped and discharged to an approved location downstream.*
14. *Clean stone may be used at the discharge point to protect the drainage channel against scouring. It will also act to filter silty water arising from dam installation and removal afterwards.*
15. *The existing bridge deck, beams, and abutments will be dismantled using excavators and mechanical equipment positioned away from the watercourse.*
16. *Debris netting or sheeting will be placed near the bank to prevent material entering the channel.*
17. *Material will be segregated and transported to licensed disposal or recycling facilities.*
18. *The excavated bridge and associated structure will be loaded into a dumper and transported to a suitable disposal area.*
19. *Any suitable materials from the drainage channel bed will be removed and stockpiled for reinstatement in the new bed upon completion of the construction works.*

Following removal of existing infrastructure, Proposed Wind Farm Crossing 4 and Proposed Wind Farm Crossing 7, along with the 3 no. new clear span crossings, will be installed using the methodology outlined below.

The standard construction methodology for the installation of a clear-span bridge watercourse crossing is as follows:

1. *The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing.*
2. *All drainage measures along the proposed road will be installed in advance of the works.*
3. *A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along a 1m setback from the stream bank with no instream works required.*
4. *Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.*
5. *Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.*
6. *Where the bottomless box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse,*
7. *Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.*
8. *Underground cabling ducting will be contained within the road make-up of the proposed crossing.*
9. *Temporary works, bunds, and containment systems will be removed once approved by the ECoW.*
10. *Post-construction inspections will be carried out to confirm no sedimentation or pollution has occurred.*

11. *A final compliance report will be prepared and submitted as required by the regulatory authorities and the new bridge structure will be inspected annually by a competent civil engineer.*

A standard design drawing of a pre-cast concrete, clear-span crossing is shown in Figure 4-57 of Chapter 4 of the EIAR.

The clear-span watercourse crossing methodologies presented will ensure that no instream works are necessary.

The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines '*Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945*', and in consultation with Inland Fisheries Ireland (see Section 2.9.4.6 of Chapter 2 for further detail on consultation with IFI). Abutments will be constructed from precast units combined with in situ foundations, placed within an acceptable backfill material.

Confirmatory inspections of the proposed watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.

2.3.3.13.2 Culvert Crossing

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters must be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900mm diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-58 of Chapter 4 of the EIAR for details.

2.3.3.14 Peat and Spoil Management

Excess overburden will be generated through construction activities within the Project Site; this excess will be managed within peat and spoil areas, around hardstanding's, along access roads as shown in Figure 4-1 of Chapter 4 of the EIAR. A detailed breakdown of the capacity of the Project Site to store peat and spoil is shown in Table 4-4 of Chapter 4 of the EIAR and is further detailed in the Peat and Spoil Management Plan (Appendix 4-3).

The total volume of peat that can be reused on site is estimated at 1,046,500m^3. Peat and spoil material will be excavated and deposited in the peat and spoil reuse areas, with a total capacity volume of 864,000m^3. Peat and spoil material will also be placed within the dedicated peat and spoil reuse areas, sidecast around hardstanding's and along access roads with gentle gradients. As such, there is enough capacity within the Project Site for the total volumes of peat and spoil requiring management for the Proposed Project as detailed in Table 4-4 of Chapter 4 of the EIAR.

The following, outlined in the Peat and Spoil Management Plan in Appendix 4-3, particular recommendations/best practice guidelines for the placement of peat and spoil with respect to specific aspects of the Proposed Wind Farm will be considered and taken into account during construction.

2.3.4 Proposed Grid Connection

2.3.4.1 Substation and Control Buildings

2.3.4.1.1 *Proposed Onsite Substation*

It is proposed to construct a 220 kV electricity substation within the Proposed Wind Farm site, as shown in Figure 4-1 in Chapter 4 of the EIAR. The Proposed Onsite Substation is located in the eastern section of the Proposed Wind Farm, in the northeast of Lodge Bog, Co. Kildare, in the townland of Lullymore East.

The Proposed Onsite Substation will be permanently connected to the Transmission System Network and will become a permanent ESB Network Asset. The construction and detailed design of electrical equipment in the Proposed Onsite Substation will be to ESB/EirGrid network specifications and will be under the operation and ownership of the Transmission System Operator (TSO) / Transmission Asset Owner (TAO) EirGrid or ESB Networks (ESBN).

The construction of the Proposed Onsite Substation compound will consist of a 220kV two-storey switching GIS building, a 110kV two-storey switching GIS building, an IPP control building, a 36m telecommunications tower, and associated outdoor electrical equipment. Once ground preparation per the methodology for site roads as described previously is completed, the Proposed Onsite Substation will be constructed by the following methodology:

1. *The 220kV GIS building and 110kV GIS building will be in a compound, which includes the IPP control building. The onsite substation compound including the IPC control building is approximately 224m by 117m, surrounded by a 2.6m-high palisade fence with a total area approximately 25,615 m2. See Plate 4-18 below for a 220kV GIS switching substation.*
2. *The IPP compound will have a shared fence line with the 220kV substation.*
3. *The substation and IPP compound drainage will be marked by a qualified engineer.*
4. *A drainage system will be installed around the compound area.*
5. *Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material shall be temporally stored in adjacent berms for layer use during reinstatement works.*
6. *A layer of geotextile material will be laid over the footprint of the compound (please see Plate 4-18 of Chapter 4 of the EIAR).*
7. *Using an excavator, a base of clause 804 material shall be laid followed by a 6F2 layer which will provide a finished surface. Clause 804 material is a specific type of material used in road construction and sub-base layers consisted of crushed stone, crushed concrete, or a mixture of both, 6F2 material is a granular fill material consisting of crushed concrete, crushed brick, or reclaimed construction aggregate.*
8. *Each layer will be compacted using a vibrating roller.*
9. *Earthing cable will be laid underground around the vicinity of the substation for connection to various electrical components during the electrical fit-out phase.*
10. *Adequate lighting will be installed around on the compound on lighting masts.*
11. *Lighting protection masts with an approximate height of 18m shall be installed to provide lighting protection to the substation compound.*
12. *The electrical equipment will be installed and commissioned.*
13. *Perimeter fencing will be erected.*

The construction and components of the substation will be to ESB or EirGrid specifications. The Proposed Onsite Substation and all ancillary infrastructure will be accessible from a dedicated road as shown on Planning Drawing in Appendix 4-1 of the EIAR.

2.3.4.1.2 Proposed Offsite Substation

It is proposed to construct the Proposed Offsite Substation within the Project Site, as shown in Figure 4-1 and Figure 4-3 of Chapter 4 of the EIAR. The Proposed Offsite Substation is located within an agricultural field east of the Proposed Wind Farm, in the townland of Killybegs, Co. Kildare.

The Proposed Offsite Substation will be permanently connected to the Transmission System Network and will become a permanent ESB Network Asset. The construction and detailed design of electrical equipment in the Proposed Offsite Substation will be to ESB/EirGrid network specifications and will be under the operation and ownership of the TSO/ TAO EirGrid or ESBN. Access to the Proposed Offsite Substation will be from a new entrance off the L6002 local road (Site Entrance 7M), please see Table 4-7 below for further detail. Access to the L6002 local road is via the R403 and R408 which run to the north of the Proposed Offsite Substation. Please see Section 4.5.1 below for detail on site entrances for the Proposed Project. This site entrance location will facilitate EirGrid/ESB access during the operational phase of the Proposed Project and beyond.

The construction of the Proposed Offsite Substation compound will consist of a 220kV two-storey switching GIS building, a 36m telecommunications tower, 2 no. new steel masts, and 2 no. new gantry structures and associated outdoor electrical equipment. Once ground preparation as per the methodology for internal site access roads as described previously is completed, the Proposed Offsite Substation will be constructed by the following methodology:

1. *The 220kV GIS building will be in a compound of approximately 113.5m by 82m, surrounded by a 2.6m-high palisade fence with a total area c. 9,307m2*
2. *The substation drainage will be marked by a qualified engineer.*
3. *A drainage system shall be installed around the compound area.*
4. *Topsoil and subsoil shall be removed from the footprint of the compound using an excavator.*
5. *A layer of geotextile material shall be laid over the footprint of the compound (please see Plate 4–18 of Chapter 4 of the EIAR).*
6. *Using an excavator, a base of clause 804 material shall be laid followed by a 6F2 layer which will provide a finished surface. Clause 804 material is a specific type of material used in road construction and sub-base layers consisted of crushed stone, crushed concrete, or a mixture of both, 6F2 material is a granular fill material consisting of crushed concrete, crushed brick, or reclaimed construction aggregate.*
7. *Each layer will be compacted using a vibrating roller.*
8. *Earthing cable will be laid underground around the vicinity of the substation for connection to various electrical components during the electrical fit-out phase.*
9. *Adequate lighting will be installed around on the compound on lighting masts.*
10. *Lighting protection masts with an approximate height of 18m shall be installed to provide lighting protection to the substation compound*
11. *The 2 no. new steel masts and 2 no. new gantry structures are required to connect the 220kV overhead lines into the substation – these will be constructed in line with the methodology outlined in Section 2.3.4.3.1 and Section 2.3.4.3.2 below.*
12. *The electrical equipment will be installed and commissioned.*
13. *Perimeter fencing will be erected.*

The construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy and equipment delivery schedules.

The construction and components of the substation will be to ESBN and/or EirGrid specifications. The Proposed Offsite Substation and all ancillary infrastructure will be accessible from a dedicated road as shown on Planning Drawing in Appendix 4-1 of the EIAR.

2.3.4.2 Underground 220kV Electrical Cabling

The underground electrical cabling route from the Proposed Onsite Substation to the Proposed Offsite Substation, as shown in Appendix 4-1 of the EIAR, will primarily require open cut trenching construction methods, with one location requiring Horizontal Directional Drilling (HDD). HDD is required to traverse underneath the Grand Canal approximately 0.15km west of the Shee Bridge Co. Kildare. The route of the underground electrical cabling between substations is outlined in Section 4.4.2.3 of Chapter 4 of the EIAR. The entirety of the underground electrical cabling route has been assessed throughout the EIAR.

Construction methodologies to be implemented and materials to be used will ensure that the Proposed Grid Connection underground electrical cabling route is installed in accordance with the requirements and specifications of EirGrid and ESB. The general construction methodology for trenching and sequencing is anticipated to be as follows:

1. *The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning application and accompanying reports and as required by planning conditions where relevant;*
2. *All existing underground services will be identified on site prior to the commencement of construction works;*
3. *At watercourse crossings, the contractor will be required to adhere to the environmental control measures outlined within the planning application and accompanying reports, this CEMP will be updated prior to the commencement of construction, and best practice construction methodologies;*
4. *Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with ESBN/EirGrid and Uisce Eireann specifications;*
5. *Traffic management measures will be implemented in accordance with those included in the Traffic Management Report, and a detailed Traffic Management Plan (TMP) will be prepared and agreed with Kildare County Council;*
6. *A one lane closure will be maintained during the construction of the grid connection;*
7. *Excavated material will be used to backfill the trench where appropriate and any surplus material will be transported off site and disposed of at a fully authorised soil recovery site;*
8. *Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement;*
9. *The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature;*
10. *Where required, grass will be reinstated by either seeding or by replacing with grass turves;*
11. *No more than a 100-120m section of trench, to be agreed with the county council, will be opened at any one time. A second part will only be excavated once the majority of reinstatement has been completed on the first or to the agreement of the licenced authority. The standard length agreed will be approximately 100m;*
12. *The excavation, installation and reinstatement process will take one crew on average of 1 no. day to complete a 100m section;*
13. *Where the cable is being installed in a roadway, temporary reinstatement may be provided to allow larger sections of road to be permanently reinstated together;*

14. *Following the installation of ducting, pulling the cable will take approximately 1 no. day between each joint bay, with the jointing of cables taking approximately 1 week per joint bay location.*
15. *Typical HV Underground Duct Installation*
16. *For the trenching and ducting works the following step by step methodology will apply:*
17. *Grade, smooth and trim trench floor when the required 1425mm depth and 700mm width have been obtained.*
18. *Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.*
19. *Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.*
20. *Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.*
21. *Place cable protection strips on compacted CBGM B directly over the ducts.*
22. *Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.*
23. *Carefully surround and cover ducts with CBGM B material in accordance with the drawings and thoroughly compact without damaging ducts.*
24. *Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.*
25. *Place and thoroughly compact CBGM B material or Clause 804 backfill or soil backfill as specified and place warning tape at the depth shown on the drawings.*
26. *For unsurfaced/grass sections, backfill with suitable excavated material to ground level leaving at least 100 mm topsoil or match existing level at the top to allow for seeding or replace turves as per the specification of the local authority, etc.*
27. *Clean and test the ducts in accordance with the specification by pulling through a brush and mandrel. Install 12 mm polypropylene draw rope in each duct and seal all ducts using robust duct end seals fitted with rope attachment eyes in preparation for cable installation at a later date. All the works should be witnessed by ESBN Clerk of Works (CoW) as required.*

2.3.4.3 Overhead Line Grid Connection Electrical Cabling Route

A 220kV connection between the Proposed Project and the national electricity grid will be necessary to export electricity from the Proposed Project. It is proposed to construct the Proposed Offsite Substation within the Project Site and to connect this to the existing Maynooth-Dunstown 220kV OHL via an OHL connection in the townland of Killybegs, Co. Kildare. The location of the Proposed Grid Connection OHL cabling is detailed in Figure 4-1 and Figure 4-3 of Chapter 4 of the EIAR.

The Proposed Grid Connection will consist of approximately 0.12km of OHL (comprising 0.06km of OHL from the proposed 2 no. steel masts for the loop-in from the Proposed Offsite Substation to the existing OHL), consisting of 2 no. new steel masts, and 2 no. new gantry structures. The location of the 2 no. new proposed steel masts are shown on Plate 4-4 of Chapter 4 of the EIAR.

The proposed design for the Proposed Grid Connection will require two new mast structures which will be constructed under the existing Maynooth-Dunstown 220kV OHL. The existing transmission line will be broken between two existing towers (Tower 46 and Tower 47) into 2 no. new steel masts which will connect to the 2 no. new gantry structures located within the Proposed Offsite Substation. Please see the locations of the 2 no. new steel masts and 2 no. new gantry structures on Plate 4-3 of Chapter 4 of the EIAR.

The general construction methodology and sequencing for the OHL connection to the existing Maynooth-Dunstown 220kV OHL is as follows:

- Safety precautions will be in place reflecting working in the vicinity of a live line and to mitigate any potential risk to the operational line during construction works. Mast sites are scanned for underground services such as cables, water pipes etc.
- The duration of works of the overhead line construction is anticipated to be twelve weeks. The timeframe for construction of foundations for masts is approximated to seven days each allowing time for curation of the concrete. The erection of the masts is approximated to 5 days, dependent on suitable weather conditions at time of installation. Stringing of conductors is typically a four-week process and final connection to the existing grid will be carried out by Electricity Supply Board Networks (ESBN).
- The construction of the 2 no. new steel masts and 2 no. new gantry structures will be as outlined below. To allow for safe construction where ground conditions are good, the excavation will be stepped back which requires additional area to be excavated. The formation levels (depths) will be checked by the onsite engineer.

2.3.4.3.1 *Steel Mast Structures*

Indicatively strain towers are required for the loop-in connection, exact detail to be confirmed at detailed design stage signoff by ESBN/EirGrid. The following section outlines the methodology to be followed during construction works of the new steel masts which will be constructed underneath the existing Maynooth-Dunstown 220kV OHL:

1. *Mast sites are scanned for underground services such as cables, water pipes etc.*
2. *For leg of the 2 masts (8 legs in total) a foundation c.4.4m x 4.4m x 3.6m is excavated and the formation levels (depths) will be checked by the onsite foreman. See Plates 4-12 and 4-13 in Chapter 4 of the EIAR.*
3. *A concrete pipe will be placed into each excavation to allow operatives level the mast at the bottom of the excavation. The frame of the reinforcing bars will be prepared and strapped to a concrete pipe with spacers as required. The reinforcing bars will be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each mast will then be assembled next to the excavation.*
4. *In areas of insufficient ground and high-water table, it may be necessary to use sheet piles supported by hydraulic frame(s) to prevent collapse of the sides and prevent the excavation becoming too large. In this scenario, the requirement of a concrete pipe (which is typically used in tower foundations) is removed. During any dewatering activities, a standard water filtration system shall be utilised to control the amount of sediment in surface ware runoff.*
5. *A setting template is used to set and hold the tower stubs in position while the concrete is being poured and cured. And water in the excavation will be poured out prior to any concrete being poured into the foundation.*
6. *Concrete trucks will pour concrete directly into each excavation in distinct stages.*
7. *A final pour for the mast is the encasing of the mast leg which shall be finished 300mm over finished ground level. The leg of the mast is required to be shuttered with metal panels to form its required shape (see Plate 4-14 in Chapter 4 of the EIAR)*
8. *Once concrete is set after five days, the shuttering is removed along with sheet piles (if required).*
9. *The mast foundations will be backfilled one leg at a time with the material already excavated at the location. The backfill will be placed and compacted in layers. All surplus excavated material and removed from the mast locations and stored in berms for use across the construction site*
10. *For the masts located under the existing line, the line will be de-energised by ESB so work can commence on the construction of the masts. Where it is offline the masts will be built without an outage.*
11. *An earth mat consisting of copper wire will be laid c. 400mm below ground around the mast.*

12. *Once the base section of each mast is completed and its concrete is sufficiently cured, it is ready to receive the mast body.*
13. *A hardstand area for the crane will be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate*
14. *A physical barrier (Heras Fence Site Boundary) will be put in place to restrict plant from coming too close to the OHL.*
15. *The conductor will be centred over the masts and held in place. Once the conductor is secured at both ends it is then cut and attached onto each mast. The section of conductor in between the two masts will be removed and utilised as connector wire for the new masts.*
16. *A temporary hardstand area will be constructed to allow the assembly and laydown of the towers.*
17. *As the masts are located under the existing 220kV line, the line will be de-energised by ESB Networks so work can commence on the construction of the masts.*
18. *The mast section will be lifted into place using the crane and guide ropes and the body sections will be bolted into position (see Plate 4-15 in Chapter 4 of the EIAR).*
19. *The circuit will be tested in both directions before the line is re-energised.*

2.3.4.3.2 Gantry Structures

The following section outlines the methodology to be followed during construction works of the gantry tower structures which will be constructed underneath the existing Maynooth-Dunstown 220kV OHL:

- A foundation of c. 5m x 4m x 2.35m deep will be constructed.
- Reinforced bars shall be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each gantry will be assembled next to the excavation
- A setting template is sued to set and hold the gantry J-bolts in position while the concrete is being poured and cured.
- Concrete trucks shall pour concrete directly into each excavation in distinct stages. A final pour for the base is the encasing of the gantry leg which shall be finished 300mm over finished ground level.
- The gantry foundations shall be backfilled on leg at a time with a 200mm layer of deep compacted T.0 graded granular fill material. A finishing 100mm layer of compound stone is layered on top of a geotextile to finish the compound ground level. The backfill shall be placed and compacted in layers.
- A hardstand area for the crane shall be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate.
- A physical barrier (Heras Fence Site Boundary) and virtual barriers shall be put in place to restrict plant from coming too close to the OHL.
- A temporary access road shall be constructed to allow access to the tower locations.
- A temporary hardstand area shall be constructed to allow the assembly and laydown of the gantries.
- The gantries shall be constructed lying flat on the ground beside the recently installed cable compound on the temporary hardstand.
- The gantry section will be lifted into place using the crane and guide ropes and the body section will be bolted into place (see Plate 4-16 in Chapter 4 of the EIAR).

2.3.4.3.3 Stringing of Conductors

Stringing of OHLs on the supporting lattice structures will be kept clear of all obstacles along the straight by applying sufficient tension. This method requires the pulling of a light pilot line (nylon rope) which is normally carried by hand into the stringing wheels. This in turn is used to pull a heavier pilot line (steel rope) which is subsequently used to pull the conductors from the drum stands using specifically designed “puller – tensioner” machines (Plate 4-21 in Chapter 4 of the EIAR). The main advantages with this method are:

- The line is protected from surface damage.
- Major obstacles can be completed without any significant disruption.

Once the conductors have been pulled into position, one end of the straight is terminated on the appropriate tension fittings and insulator assemblies. The free end of the straight is then placed in temporary clamps which take the conductor tension. The conductor is then cut from the puller-tensioner and the conductor is sagged using a chain hoist. Bird flight diverters or warning spheres can be added following the sagging procedure if required.

2.3.4.4 Joint Bays

Joint bays are pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. Joint bays will be located at various points along the Proposed Grid Connection route generally between 600 to 800 metre intervals or as otherwise required by ESBN and electrical designer requirements. Joint Bays are approximately 6m x 2.5m x 1.475m pre-cast concrete structures installed below finished ground level.

Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation, ease of maintenance and create less traffic congestion. Joint Bays will be located in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this may not always be possible. Construction of joint bays will adhere to the Department of Transport (2026) Interim Guidance and to the agreement of the TSO. During construction the joint bay locations will be completely fenced off once they have been constructed, they will be backfilled until cables are being installed. Once the cabling is installed the joint bays will be permanently backfilled with the existing surface re-instated and there will be no discernible evidence of the joint bay on the ground. Mitigation measures will be implemented throughout the construction process to ensure the installation and construction of the joint bays does not impact nearby protected structures and/or watercourses.

In association with Joint Bays, Communication Chambers are required at joint bay locations to facilitate communication links between the Proposed Onsite Substation and Proposed Offsite Substation. Earth Sheath Link Chambers are also required approximately every joint bay along the Proposed Grid Connection underground electrical cabling route. Communication Chambers will typically be pre-cast concrete structures with an access cover at finished surface level. The indicative locations of the joint bays and chambers are shown in Appendix 4-1 of the EIAR.

The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to detailed design approval by ESB Networks.

2.3.4.5 Bored Well

There will be 2 no. bored well, each being constructed adjacent to the Proposed Onsite Substation and Proposed Offsite Substation in line with the construction methodology of a common domestic borehole using a drilling rig. The rig will be reversed to the target drill site to the exact proposed well location. Final plumbing and centralising will be completed utilising hydraulic jacks and packing plates to ensure a secure base for the rig. When this has been completed, the mast will be erected, and final levelling will take place.

Open hole drilling will commence using a rotating drill head to accommodate a 200 mm outer conductor steel casing to adequate depth. A nominal 125 mm PVC well sleeve mid-range will be placed within the borehole once drilling head and string have been removed.

The drill string is that part of the drilling unit which works mainly within the borehole, connecting the surface drill rig to the bit. In effect the main function of the drill string is the efficient transmission of power in the deepening hole. As required the drill pipes are mechanically lifted into place and released

when the drill pipe is over the table. The next pipe is then screwed into the last drill pipe and torqued up as drilling continues.

Air and water will be used to flush out the hole as drilling proceeds. Discharge water and drill cuttings will be diverted to an adapted skip by Bauer pipe from drill table at the back of the drilling rig. This will allow settlement of fines and sediment.

An in-well pump will direct water to a water tank within the roof space of the proposed control building (subject to final design).

2.3.4.6 Underground Cabling Watercourse/Culvert/Service Crossings

A total of 11 no. existing watercourses have been identified that intersect / cross the proposed underground grid-connection route. The locations of the watercourse crossings are shown on the detailed layout drawings in Appendix 4-1 of the EIAR. The watercourse crossing methodologies are set out in Section 4.9.2.7 of Chapter 4; proposed crossing methodology illustrated on Figure 4-61 to Figure 4-64 in Chapter 4 of the EIAR, with the most appropriated option being selected for each crossing. Instream works are not required at any watercourse crossing along the Proposed Grid Connection underground route.

Should an alternative methodology to those listed below be required for individual crossings during the construction process this will be agreed with the relevant authorities including Kildare County Council prior to works commencing.

2.3.4.6.1 *Crossing Using Standard Trefoil Formation Over – Type A*

Type A is not proposed to be used at any watercourse crossing location along the Proposed Grid Connection underground electrical cabling route. However, at the time of construction if Type A is required, the following methodology will be applied. Watercourses will not be directly impacted upon since no instream works or bridge/culvert alterations are proposed. Where adequate cover exists above a bridge/culvert or where a new bottomless box culvert or clear-span structure has been installed at a sufficient depth, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert, water course or existing underground service. The cable trench will pass over the crossing in a standard trench.

Please see Figure 4-61 in Chapter 4 of the EIAR for further details.

2.3.4.6.2 *Flatbed Formation Under– Type B*

Where cable ducts are to be installed under an existing watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench, the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material under it. The ducts will be laid in this trench in a flatbed formation under the existing watercourse/ service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Please see Figure 4-62 in Chapter 4 of the EIAR for further details.

2.3.4.6.3 *Flatbed Formation Over– Type C*

Where cable ducts are to be installed over a watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material over it. The ducts will be laid in this trench in a flatbed formation over

the existing culvert and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Where a bridge/culvert or service has insufficient cover depth to fully accommodate the required trench, the ducts can be laid in a flatbed formation partially within the existing road surface. Where this option is to be employed, the ducts will also be encased in steel with a concrete surround as per ESB Networks specifications. In order to achieve cover over these ducts and restore the carriageway of the road, it may be necessary to raise the pavement level locally to fully cover the ducts. The increased road level will be achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing over the culvert has been achieved, the ducts will resume to the trefoil arrangement within a standard trench.

Please see Figure 4-63 in Chapter 4 of the EIAR for further details.

2.3.4.6.4 *Horizontal Directional Drilling – Type D*

The proposed HDD methodology is as follows:

1. *The drilling rig and fluid handling units located on one side of the crossing will be stored on double bunded 0.5mm PVC bunds which will contain any accidental fluid spills and storm water run-off.*
2. *Entry and exit pits (2m x 2m x 1.5m) will be excavated; the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility.*
3. *A 2m x 2m x 1.5m steel box will be placed in each pit. This box will capture any drilling fluid returns from the borehole.*
4. *The drill bit will be set up by a surveyor, and the driller will push the drill string into the ground and will steer the bore path under the stream-ways and the forestry.*
5. *A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded.*
6. *The drilled cuttings will be flushed back by drilling fluid to the steel box in the entry pit.*
7. *Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side.*
8. *When all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore.*
9. *The steel boxes will be removed, and the drilling fluid disposed of to a licensed facility.*
10. *The ducts will be cleaned and proven and their installed location surveyed.*
11. *The entry and exit pits will be reinstated as per the landowners' requirements.*
12. *A typical HDD would take 3 days. This is dependent on a number of factors such as ground conditions, geology, etc. and would be taken into account during design stage by the HDD contractor.*

Please see an illustration of the HDD methodology on Figure 4-64 in Chapter 4 of the EIAR.

2.3.4.7 Telecommunications Towers

As part of the Proposed Grid Connection, there will be 1 no. telecommunication towers proposed at both the Proposed Onsite Substation and 1 no. at the Proposed Offsite Substation. The telecommunications towers serve to provide as a communication link during the operational stage and to relay data between the Proposed Project and external monitoring/management stations. The towers will be free-standing structure of 36m in height and will be constructed on a hard-standing area measuring approximately 7m by 7m to accommodate the crane that will be used to erect the mast, adjacent to proposed roads. The indicative design of the proposed telecommunications towers is shown in Figure 4-43 in Chapter 4 of the EIAR.

2.3.5 Proposed Enhancement Areas

A Biodiversity Management Plan (BMP) has been prepared for the Proposed Project and is included as Appendix 6-5 of the EIAR. This plan has been developed to offset the loss of habitats identified within the Project Site and further to enhance the biodiversity (flora and fauna, including birds) of the Project Site and its environs. These measures have also been considered in the ornithological impact assessment and landscape and visual impact assessment which is included in Chapter 7 Birds and Chapter 13 Landscape & Visual, of the EIAR. Similarly, the drainage design for the Proposed Project which has been prepared by HES and is included in Appendix 4-5 of the EIAR has also taken the BMP measures into consideration from a drainage perspective.

Irrespective of the consenting or construction of the Proposed Project, the measures outlined in the Draft Cutaway Bog Decommissioning and Rehabilitation Plan (Draft Rehabilitation Plan) (Appendix 2-4) will be implemented by the Applicant in agreement with the EPA, per Applicant's IPC Licence Obligations (P0503-01).

2.3.5.1 Ornithological Offsetting and Enhancement

Scrub Mosaic Creation Mitigation Areas

As outlined in Section 4.2 of Appendix 6-5, a scrub mosaic habitat of approximately 246.27ha will be created within 250m of the Proposed Turbines to make the areas unsuitable for golden plover. The aim of these management prescriptions is to create a mosaic habitat where open habitats of greater than 10ha does not exist as golden plover prefer open areas larger than 20ha and actively avoid areas which are smaller than 10ha[2]. The management prescriptions below aim to create a mosaic habitat where open areas of greater than 10ha exist. This will be achieved by planting or promoting scrub in smaller patches (1-5ha) within these larger open areas to fragment these open areas.

Management prescriptions to be implemented are detailed in Appendix 6-5 and summarised below:

- Where open areas are adjacent to mature scrub (i.e. in areas where a good seed bank is likely to exist within the peat already), agricultural lime (calcium carbonate) and slow-release fertilizer will be applied to accelerate the germination and growth of scrub species (e.g. birch and willow spp.).
- In more open habitats (where peat production has most recently been ceased), the natural seed bank may be absent; it is therefore proposed to plant native scrub species (e.g. birch and willow spp.) at a density of one plant per square meter.
- Drain blocking may be required where dry cutover peat exists and conditions are not optimal for the germination or success of transplanting of scrub species (e.g. birch and willow spp.).
- Slow-release fertiliser will be applied to all scrub areas to accelerate the establishment of the scrub
- It is proposed to attract golden plover to lower risk areas through the creation of attractive habitat plus the use of golden plover lures/decoys, as outlined in Objective 2 and Objective 3 below.
- Monitoring for golden plover carcasses will be undertaken during the operational phase of the Proposed Project, as outlined in Section 5 of Appendix 6-5. Curtailment will be implemented if the number of golden plover carcasses found are above the threshold set, see Section 5.1.1.2.1 of Appendix 6-5 for further details.

[2] *Leitão, D. & S. Peris. 2015. Annual variation in habitat use by Northern Lapwings Vanellus vanellus and Eurasian Golden Plovers Pluvialis apricaria wintering in Portugal. Wader Study 122(2): 115–127*

Lodge Bog Enhancement

The enhancement of lodge bog will be achieved through a number of separate measures, each of these measures is summarised below and described in detail within Appendix 6-5 to this EIAR.

Scrub Removal and Management

The key measure proposed at Lodge Bog is the permanent removal of scrub within the enhancement area and the management of the area to ensure scrub does not recolonise over the lifetime of the Proposed Project. Management prescriptions to be implemented are detailed in Appendix 6-5 and summarised below:

- All areas of scrub, trees and shrubs will be permanently removed. The timber and brash will be mulched to waste and left on-site. The heavier timber will be removed from site where mulching is not practical. The area will be allowed to revert to peatland habitat and therefore will create suitable habitat for golden plover and breeding waders. Felling/mulching of scrub will be undertaken before the first winter season of the construction phase of the project programme. This will ensure replacement habitat would be available in advance of the operational phase.
- Heavy machinery, e.g. specially adapted tracked excavators and mulching mowers, will be used to clear large areas of dense scrub.
- Scrub will be removed by hand from areas of suitable marsh fritillary habitat to minimize the damage to the underlying habitat. These areas will be identified during a preconstruction habitat survey.
- The vegetation sward will be maintained at the optimal height for waders, including golden plover and lapwing, of approximately 7-10cm (Brough and Bridgman, 1980; Gregory, 1987; Milson *et al.,* 1998). Golden plover tend to avoid areas where the sward height exceeds 10-20cm (Brough and Bridgman, 1980; Gregory, 1987). Therefore, a sward height of between 7-10cm will be maintained in this area during the winter months. This will be achieved through summer and autumn grazing with livestock or through mechanical means using a flail or mulcher. A sward height of 7-10cm will be achieved by the end of August each year to ensure suitable conditions are available when golden plover return for the winter. If there is an extended growing season into September and October of any given year and the vegetation height exceeds 10cm in these months, further mechanical intervention or grazing may be required in October.
- Self-seeding conifers and scrub vegetation originating as windblown seedlings from adjacent and nearby commercial conifer plantations and nearby scrub and bog woodland, are a threat to the viability of the enhancement areas. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for golden plover and breeding lapwing. Habitat maintenance of the area will involve the eradication of self-seeding trees and shrubs, and mulching to waste and left on-site. The frequency of this management intervention will be informed by monitoring. The monitoring outlined in Section 5 below will monitor the level of encroachment by self-seeding trees and shrubs and will bring the scheduled removal forward as required.
- In the event of any invasive species being recorded within the Proposed Enhancement Area, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of native scrub or self-seeding trees. However, herbicides may be required for the eradication of invasive species such as Rhododendron or Japanese Knotweed, if required.
- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high

conservation concern is identified, no works shall be undertaken within a species-specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- Measures will be implemented during the construction phase. This will ensure that the area is suitable for golden plover at the start of the operational phase.

Permanent Waterbodies for Whooper Swan

Two Proposed Enhancement Areas are proposed for whooper swan to replace the loss of roosting habitat to the Proposed Project. As detailed in Section 7.3.7.15 of Chapter 7, roosting was recorded across a total of seven areas within the Proposed Wind Farm site across the six winter seasons surveyed, with a maximum of five areas being used in any one season.

Two areas are proposed within Lodge Bog, which are 7.8ha and 5.6 ha, (please see Figure 6-5-3 of Appendix 6-5 for location details) in areas of wetland which has already undergone the following works under the PCAS scheme: intensive and targeted drain blocking, the creation of berms to control/retain water levels, peat field re-profiling, modifying outfalls and managing overflows, seeding and inoculation of Sphagnum. The measures proposed includes the controlled flooding of an area to a depth of approximately 1.5m. This will be achieved by creating an encircling embankment to contain the water. The controlled flooding will be such that water will be present during the winter months when whooper swan are present (October to March).

As previously outlined, the objective is to create shallow waterbodies of approximately 7.8ha and 5.6ha and 1.5m depth to accommodate winter roosting whooper swan. This will be achieved as follows:

- Wetland management: the proposed approximately 7.8ha and 5.6ha shallow water bodies (wetland) will be created with encircling embankments. The internal embankment height will be approximately 2m to ensure the target depth of 1.5m of water can be accommodated. The top width of the embankment should be a minimum of 5m with a slope of 3:1.
    - The embankment is formed using a bulldozer to push the peat into place, which is then shaped by an excavator. As the peat and subsoil is shaped by the excavator, it should be compacted to make the peat less permeable.
        - The top of the embankment, above the target water level of 1.5m, will include overflow pipes to avoid high water levels eroding channels through the top of the embankment.
        - Herbicides and pesticides are not permitted within the enhancement area.
        - In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species. A pre-commencement survey for invasive species will be undertaken as part of preparatory work and if any such species are recorded an invasive species management plan shall be prepared.
        - Maintenance is expected to be low. Occasionally, drop boards from the sluice gate may need to be replaced if they are damaged.
        - Measures will be implemented during the construction phase. This will ensure that the area is suitable for whooper swan at the start of the operational phase.

Breeding Wader Areas

Three enhancement areas for breeding waders are proposed, primarily for lapwing to replace the breeding habitat lost to the Proposed Project. As detailed in Section 7.3.7.21 of Chapter 7, lapwing breeding activity was identified within the Proposed Wind Farm site, with an estimated 23 pairs breeding within the Proposed Wind Farm site in the most recent breeding season surveyed (i.e. 2025).

The areas proposed within Lodge Bog are 12ha, 7ha and 6ha, which equates to a total proposed area of 25ha. There are two areas (12ha and 6ha) within areas of PCAS which have undergone more intense

drain blocking, with outflows blocked and managed. The remaining area (7ha) is within an area adjacent to wetlands where minimal work was required through the IPC Licence rehabilitation, however, there has historically been waders breeding within or adjacent to this proposed area (see Figure 6-5-6 of Appendix 6-5 for location details). These proposed areas will be managed by annual mowing to keep the land open for breeding waders and free of avian predator posts (e.g. through scrub encroachment). The annual mowing cycle will be implemented as lapwing (and other waders such as curlew and ringed plover) prefer a short open sward.

The objective is to create good quality breeding wader habitat that is defined as having a stable water table, an open aspect throughout, a short sward and reduced predation. This will be achieved as follows:

- The areas have already undergone PCAS rehabilitation, however there may be the requirement for some areas to be levelled (re-profiled) to stabilise the water table and facilitate the mowing necessary to maintain the required open aspect. A bulldozer will be used to level/remove any remaining camber from the former peat production fields and infill the drains which have not already undergone drain blocking through PCAS. Any remaining drains around the perimeter will be infilled first and as a priority, as the proposed predator-proof fencing would be made ineffectual if mammalian predators could travel under the fence via a drainage channel. If there is not sufficient peat to infill the remaining sections of the drains, the edges will be re-profiled with a tapered edge. This measure will facilitate easy egress for chicks should they fall into a drain. The newly created breeding wader areas should be at least the level of the surroundings peat to avoid large areas of pooling water.
- Using an excavator, wader scrapes will be excavated to a maximum depth of 30-45cm, with gentle sloping edges to provide foraging areas for breeding waders and their chicks. The scrapes will be evenly distributed throughout the breeding wader area, with one wader scrape proposed per hectare, and preferentially placed in locations of existing hollows.
- Slow-release fertiliser will be applied, and a grass nurse crop will be sown to accelerate the revegetation of the area in the first growing season. Reapplication as necessary in subsequent years until 60% of the area has revegetated. As revegetation may be uneven, fertiliser application may need to be targeted to the underperforming areas.
- Mowing will not be required until revegetation exceeds 60% of the lapwing breeding area to a height of 5cm in late winter (before March 1st) as per BTO recommendations[3] and/or when tree seedlings (e.g. birch seedlings) are recorded within the enhancement area. Once the requirement for mowing is triggered, it will be undertaken annually thereafter.

- Mowing should be undertaken in late winter before March 1st, before earlier breeding birds arrive in March (Joys & Crick 2004). Mowing will be undertaken with low-pressure tracking machinery to avoid damaging the developing sward. The annual mowing is likely to produce permanent grassland, which is an important foraging resource for breeding lapwing (Galbraith, 1988).
  - In areas where mowing is not possible, e.g. around wader scrapes, tree seedlings will be hand-pulled or cut to the ground by hand.
  - Herbicides and pesticides are not permitted within the Proposed Enhancement Area.
  - In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species. A pre-commencement survey for invasive species will be undertaken as part of preparatory work and if any such species are recorded an invasive species management plan shall be prepared.

[3] https://www.bto.org/sites/default/files/lapwing-habitat-guide.pdf

- Measures will be implemented during the construction phase. This will ensure that the area is suitable for breeding waders at the start of the operational phase.

It is noted that this area will also be suitable for wintering waders, such as golden plover.

Predator-proof Fencing

The fence specification has been chosen in order to successfully exclude ground predators potentially present in this area (e.g. Red Fox, Badger, Otter, American Mink, Irish Stoat and Pine Marten). The NPWS, as part of recent conservation measures within the Termoncarragh Lake and Annagh Marsh SPA, have provided detailed specifications for permanent predator exclusion fencing for this specific purpose. The proposed permanent predator exclusion fencing within Lodge Bog Enhancement area has therefore been designed based on these specifications, as detailed below. Images of example permanent predator exclusion fencing to a comparable specification are provided in Plate 6-5-1 and Plate 6-5-2 of Appendix 6-5.

- The fence will be installed immediately after the works associated with the bulldozer and excavator.
- The fencing will be installed around the perimeter of the three breeding wader areas (12ha, 7ha and 6ha).
- Strainer posts shall be a minimum of 3.5m long, have a minimum diameter of 15cm and shall be driven a minimum of 90cm into the ground. Strainers shall be placed at the beginning and end of every length of fencing and at ever change of direction where the angle is greater than 30°. Strainers must also be used to accommodate any significant change in gradient and be strutted in the line of the fence. Strainers on 90° corners must be H framed and strutted. Maximum distance between strainer posts shall not exceed 100m. Strainers shall be incised (posts to be treated in accordance with IS 436);
- Intermediate posts shall be around 2.5m long, have a minimum diameter of 10cm and shall be driven a minimum of 60cm into the ground.
- Intermediate posts shall be spaced at no more than 2.5m intervals and be H framed on every change of direction. Posts shall be incised (posts to be treated in accordance with IS 436);
- High tensile 1580mm Tornado badger wire R15/158/5, to a height of 130cm off the ground forms the main body of the fence; the bottom 28cm is to be buried;
- The Tornado badger wire is to be overlain with 16-gauge, hot dipped galvanised 25mm square weld mesh (clipped to the top of the badger wire using hog rings) and both are to be dug in (by pulling back and relaying the sod) to prevent animals digging under the fence.
- Four strands of high tensile 12-gauge electric wire, tensioned and placed along the outside of the fence at 3cm, 15 cm and 25cm height above the top of the badger wire using UV resistant screw insulators. A fourth strand to be attached above these via 20cm UV resistant offset insulators to give total fence height of around 170cm. All strands connected to a single circuit although the second line at 15cm is an Earth wire. An additional live wire, connected to the single circuit, to be attached using UV resistant screw insulators on the inside of the fence at around 100cm to stop stock rubbing on posts;
- All wire to be connected using Gripple wire joiners;
- All access gates should be a minimum of 3.6m wide and at least 1.2 m high. All steel gates shall be hot dip galvanised in accordance with EN 1461 and 12 be overlain with 16-gauge, hot dipped galvanised 25mm square weld mesh, square cornered at bases and with hot dipped galvanised 45° angled brackets attached at top and overlain with same hot dipped galvanised weld mesh. Hot dipped galvanised gate post, concreted in, to be used and these to be independent of any strainer / fence post (two gates already have galvanised gate posts, and these can remain and be used). Gates to be hung using suitably sized proprietary gate hangers and the gate base shall be around

3cm above the ground. The gates also must be fitted with an adequate system which shall securely keep the gate closed. Handle openings must be secured against predators. Each gate to have a poured concrete apron buried (25- 30cm) under the gate to prevent digging;

- Insulated underground cable (IB5) is to be buried under each gate, connecting the electric wires either side and ensuring the fence remains live when gates are opened;
- There are no watercourse flow points within the proposed predator exclusion fence area. However, at any gullies or other similar depressions where deemed required, dams to prevent otter / mink access whilst maintaining flow through will be installed. To use a 300mm twin wall corrugated unperforated drainage pipe and 10-15cm or similar crushed rock. Ensure to incorporate buried Tornado badger wire above. At each pipe ends use hot dipped galvanised 25mm square weld mesh in a frame secured to the pipe to prevent animals gaining access but at same time allows for the mesh to be removed easily to clear debris. In addition, fix a section of Tornado badger wire across the watercourse width, around 5m upstream of the drainage pipe to act as a catch point to keep most debris away from the 25mm square weld mesh panel at the pipe end; and,
- Supply and installation of a solar panelled fencer (PEL Unigizers - High Power Solar Fencers - PE406S or similar) and 4 x 1.5m earth bars.
- A crow trapping regime will be implemented if required to minimise predation.

Permanent Reedbeds for Hen Harrier

It is proposed to create areas of permanent reedbeds for hen harrier, primarily to replace roosting habitats which may be lost through displacement. As detailed in Section 7.3.7.7 of Chapter 7 of the EIAR, hen harrier were recorded roosting irregularly throughout the Project Site at suitable roosting habitats, with seven roosting locations identified over the six winter seasons. No communal roosting or regularly used roost site was identified. Roosting was opportunistic; therefore, it is likely that the creation of new roosting habitat will be utilised.

It is proposed that a reedbed of Common Reed *(Phragmites australis),* Bulrush *(Typha)* and Saw Sedge *(Cladium mariscus)* will be planted adjacent to one of the permanent waterbodies proposed in Section 4.3.2.2 in Appendix 6-5, creating a wetland mosaic through simple rewetting or on the margins of PCAS areas which have undergone more intense drain blocking, with outflows blocked and managed. Where there are existing reedbeds, these will be maintained and natural expansion will be encouraged. Where reedbeds need to be planted, nursery-propagated and locally-sourced turves will be used and planted in patches which will naturally expand. Reedbeds will be planted on shallow gradients with standing vegetation which will be retained throughout winter. The reedbed will be established in shallow waters (5cm) and water levels will be raised gradually. Once established, this reedbed will remain uncut and intact for the winter, as this is more likely to support roosting. Hen harriers have been documented to use roost habitats in a wide range of sizes, from several hundred square metres to several kilometres' square metres. It is proposed that 5.6ha of reedbed mosaics be established, in line with the average size of contiguous habitats used for roosting within, and adjacent to, the Proposed Wind Farm site.

Killina Bog Offsetting Area

Approximately 60.7ha of forestry and woodland within this Killina Bog will be felled and all timber and brash will be removed from the Proposed Wind Farm site. The area will be reprofiled and managed as an open peatland/grassland habitat for the lifetime of the Proposed Project.

The measures to be implemented are detailed in Appendix 6-5 and summarised below:

- The identified area of existing forestry will be permanently removed. The timber, brash and stumps will be mulched to waste and left on-site. The heavier timber and larger stumps will be removed from site where mulching is not practical. The area

will be allowed to revert to peatland habitat. This process will be aided by drain blocking as discussed below. This will create suitable habitat for golden plover. Pre-mature felling of forestry will be undertaken before the first winter season of the construction phase of the project programme. This will allow time for the clear-felled site to revegetate in advance of the operational phase, thereby ensuring replacement habitat would be available should the predicted displacement effect occur.

- A tracked excavator machine with a shears/ harvester head will cut the trees and a second excavator will remove the timber from the site. Similarly, an excavator will be used to remove the stumps.
- The ground will be supported by brash in areas where machinery movements are required to facilitate deforestation.
- Felling will be carried out when ground conditions are dry. It is therefore anticipated that deforestation works will commence in September, in order to both avoid the bird nesting season (i.e. March – August) and coincide with suitable ground conditions. The works are anticipated to be undertaken over a period of one to two months.
    - A hydrology/hydrogeology study will be undertaken to map the movement of ground and surface water to inform the requirement for drain blocking. Forestry drainage channels will be blocked where necessary, using peat dams, as appropriate. The area will be levelled (re-profiled) to stabilise the water table and facilitate the mowing necessary to maintain the required open aspect. A bulldozer is used to level/remove any remaining camber from the former peat production fields and/or infill the drains. In flat areas, drain blocks will be placed every 50 meters and more frequently when accounting for a slope. When drains are blocked this reinstates the waterlogged conditions which are crucial for the survival of peatland plants.
    - Wader scraps will be created in suitable areas within the offsetting area.
    - The vegetation sward within this area will be maintained at the optimal height for waders, including golden plover, of approximately 7-10cm (Brough and Bridgman, 1980; Gregory, 1987; Milson *et al.,* 1998). Golden plover tend to avoid areas where the sward height exceeds 10-20cm (Brough and Bridgman, 1980; Gregory, 1987). Therefore, a sward height of between 7-10cm will be maintained in this area during the winter months. This will be achieved through summer and autumn grazing with livestock and/or through mechanical means using a flail or mulcher. A sward height of 7-10cm will be achieved by the end of August each year to ensure suitable conditions are available when golden plover return for the winter. If there is an extended growing season into September and October of any given year and the vegetation height exceeds 10cm in these months, further mechanical intervention or grazing may be required in October.
    - Decoys of golden plover will be deployed within the offsetting area. The decoys should be positioned tightly together to mimic the natural flocking behaviour of the species, in an open aspect with good views in all directions. The majority of circling flights of golden plover are of birds searching for other flocks on the ground, indicating a safe place to roost. The decoys will encourage golden plover to land within this area and, in theory, attract them to this offsetting area instead of open areas between the Proposed Turbines.
    - Self-seeding conifers and scrub vegetation originating as windblown seedlings from adjacent and nearby commercial conifer plantations and nearby scrub and bog woodland, are a threat to the viability of the enhancement areas. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for golden plover. Habitat maintenance of the area will involve the eradication of self-seeding trees and shrubs and mulched to waste and left on-site. It is envisaged that the area will require maintenance every five years during the life of the Proposed Project where annual mowing is not undertaken (e.g. adjacent to drains, areas that are too wet for machinery). The monitoring outlined in Section 5 of Appendix 6-5 will monitor the level of encroachment by self-seeding trees and shrubs and will bring the scheduled removal forward as required.

- In the event of any invasive species being recorded within the Proposed Enhancement Area, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of self-seeding trees or scrub.
- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- The requirement for any Felling License will be discussed and agreed with the Forest Service. The felling license, if required, will include management prescriptions for the felling of the forestry. Following felling, these enhancement lands will be managed for the benefit of golden plover.

The specific measures and timelines for the deforestation and restoration of these enhancement lands are outlined in Section 4.10 of Appendix 6-5

2.3.5.2 Ecological Offsetting and Enhancement

Marsh Fritillary Habitat Protection and Enhancement

The Proposed Project infrastructure footprint will result in the loss of approximately 0.67ha of habitat which was considered to be suitable for marsh fritillary.

Habitat Protection

Both suitable and confirmed breeding habitat for marsh fritillary that occur adjacent to but outside proposed works areas will be fenced off in advance of construction of the Proposed Wind Farm. These areas were identified during initial ecological surveys of the Proposed Wind Farm site, and the Proposed Wind Farm was designed to avoid the vast majority of these areas. The fencing will contain signage strictly prohibiting entry to these areas. This will denote the area where strictly no machinery, storage of materials or entry of construction site personnel will be permitted. The protective fencing will be inspected and signed off by the supervising ECoW prior to commencement of the Proposed Project. Protective measures for marsh fritillary are detailed in Appendix 6-5 and summarised below:

- Pre-commencement surveys will be carried out by the appointed ECoW to confirm the extent of suitable breeding habitat for marsh fritillary in and within 20m of the Proposed Project construction footprint to determine whether any new areas of suitable habitat for marsh fritillary have been established between planning being granted (if approved) and the commencement of construction works.
- This will be followed by pre-commencement dedicated larval web surveys of areas of identified suitable habitat for marsh fritillary at the appropriate time of year, i.e. August and September in order to determine the extent of confirmed breeding habitat for marsh fritillary.
- Any areas where confirmed and/or suitable breeding habitat for marsh fritillary were identified during surveys to inform the EIAR for the Proposed Project will be temporarily fenced off (including a minimum buffer of 5 metres) prior to the commencement of construction works. Additionally, any new areas of suitable and/or confirmed breeding habitat for marsh fritillary identified during the pre-commencement surveys will also be fenced off. Fencing will be constructed along the margins of these areas.
- The fencing will contain signage strictly prohibiting entry to these areas. This will denote the area where strictly no machinery, storage of materials or entry of

construction site personnel will be permitted. The fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the appointed ecologist on site.
- The appointed ECoW will supervise works in close proximity to confirmed and suitable breeding habitat for marsh fritillary.
- Where suitable marsh fritillary habitat occurs in close proximity to the proposed infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. This will ensure that there is no potential for direct or indirect impacts on marsh fritillary habitat. This measure will also protect existing suitable habitat for other Lepidoptera/pollinator species of local importance.

Habitat Enhancement

It is also proposed to enhance areas of identified suitable but sub-optimal habitat for marsh fritillary near a proposed internal site access road northeast of T09 and a proposed internal site access road east of T06 to improve the quality of and connectivity of the habitat for marsh fritillary. This will be achieved through targeted scrub removal and plug-planting of devil's bit scabious.

Devils bit scabious is a slow-growing perennial and may take several years to reach maturity and flower. If grown from seed, it can take 5-6 years to germinate. Therefore, plug planting with plants from a certified native source will be the preferred method[4]. An off-site nursery will be used to grow and source the plugs. However, sewing with devil's-bit scabious seed will also be considered if sourcing plug plants is a limiting factor to the BMP.

The marsh fritillary enhancement measures are detailed in Appendix 6-5 and summarised below:

- Enhancement areas will be clearly marked/fenced off to prevent inadvertent encroachment by construction activities and to ensure management actions are confined to the defined areas.
- Planting will be undertaken to increase the abundance and distribution of devil's-bit scabious within the enhancement areas using an appropriate native source.
- Management will aim to maintain a heterogeneous sward structure, comprising a mosaic of shorter and taller vegetation, rather than a uniform sward. It will also maintain the abundance of devil's-bit scabious within the enhancement areas by preventing competitive exclusion by rank grasses or scrub.
- Where vegetation becomes overly rank or scrub encroachment occurs, targeted and localised management (e.g. selective cutting or clearance by hand) will be undertaken to retain open conditions.
- No fertilisers, slurry, herbicides or pesticides will be applied within the marsh fritillary enhancement areas.
- Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less vulnerable to disturbance.
- In addition to this it is proposed to create additional 'stepping stone' habitat which is key for the survival of the meta populations of the species and to increase its distribution across the landscape. This will not only benefit marsh fritillary but a wide range of other pollinators. This is detailed in Section 4.7.2 in Appendix 6-5.

Peatland Habitat Enhancement Area

There will be a loss of 31.75ha of cutover bog to facilitate the Proposed Project. To offset this loss four areas have been identified for enhancement through drain blocking and rewetting measures.

[4] https://www.plantlife.org.uk/learning-resource/managing-meadows/

These include Blocks A, B, C and D as shown in Figure 6-5-8 of Appendix 6-5 which have a combined total area of 263.79ha. Block A is located in Ticknevin, north of T30 and T32, Block B is located in Codd 2 north west of T26, Block C is located in Codd1 northwest of T22 and Block D is located along the boundary of Ballydermot North and Ballydermot southwest of T16.

Draft Rehabilitation Plans has already been prepared for each of the 14 no. bogs within the Allen Bog Group comprising the Proposed Wind Farm site, to satisfy Condition 10 of its EPA licence P0503-01. The aim of the Draft Rehabilitation Plans is to stabilise and rehabilitate the peatland habitats within the Proposed Wind Farm site, and it is proposed that natural revegetation will form the basis for the environmental stabilisation of these areas. The BMP includes for additional peatland enhancement measures to those included within the Draft Rehabilitation Plans, including re-wetting through drain blocking, to aid in the enhancement of peatland habitat within the Proposed Wind Farm site and encourage cutover bog habitats to establish on areas of bare peat.

Prescriptive measures are unique to the existing baseline habitats and comprise three no. broad categories, 1) measures associated with deep peat cutover bog 2) those associated with wetland cutaway and 3) those associated with dry cutaway.

The measures proposed are outlined in Appendix 6-5 and summarised below:

Bare peat areas

- Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields. Areas where vegetation has established do not need fertiliser application.
- Regular drain blocking at a minimum of (3/100) using peat dams along with the blocking of outfalls and management of water levels.
- Drain blocking undertaken by a bulldozer, raising water levels, re wetting and slowing water movements through the enhancement blocks.
- Assessment of inoculation of reeds and other target species including common reed, bulrush and saw sedge from other suitable areas within the Project Site, as needed.

Vegetated cutover bog

- Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established or where tree growth limits access.
- Berms comprising embankments of peat are proposed. These will be constructed with the aim of trapping rainwater and creating shallow pools of water.
- There are areas of deeper peat within all four peatland enhancement areas. These will be targeted for more intensive drain-blocking (max 7/100 m), with field reprofiling also where suitable. Deep Peat measures will also include modifying outfalls, and management of water levels with overflow pipes and blocking of internal outfalls.

Wetland Cutaway

- Measures proposed within areas of wetland cutaway include blocking outfalls, managing water levels with overflow pipes and targeted bunding.

Refer to Table 6-5-2 of Appendix 6-5 for further detail on the typers of measures proposed within the Peatland Enhancement Blocks.

Native Tree (Woodland and Scrub) Planting

The Proposed Project will result in the loss of approx. 43.68ha of woodland to facilitate the construction of the Proposed Wind Farm, to facilitate bat buffers around turbines to make the habitat less attractive

to bats and to allow for creation/enhancement of suitable areas for golden plover within Lodge Bog and Killina Bog to offset potentially significant effects on this species as identified in the EIA

It is proposed to plant 45.3ha of native trees at five different areas (Woodland Planting Blocks A – E, as shown in Figure 6-5-3 of Appendix 6-5) to offset any losses of woodland identified. Over time this will establish into mature woodland habitat. Areas chosen for woodland planting are areas of dry cutaway and wetland cutaway.

Local variation in ground levels and hydrological conditions within the Woodland Planting Blocks will be taken into account during implementation. LiDAR topographic data and onsite observations will be used to inform species selection and planting layout, to ensure that planting is appropriate to local conditions. Where lower lying or wetter areas are identified, planting will be adapted accordingly, either through the use of appropriate wet woodland species or by allowing areas to remain as more open or transitional habitats. This approach will ensure that woodland enhancement is aligned with site conditions and allows for the gradual establishment of a structurally diverse woodland/wetland mosaic alongside ongoing peatland enhancement.

Implementation and Management

The tree felling activities required as part of the Proposed Project will be the subject of a Felling Licence application to the Forest Service, under Section 17 of the Forestry Act 2017 and as per the Forest Service's policy on felling licenses (refer to Section 4.4.1.8 above). In line with the Forest Service's published policy on granting felling licences, areas cleared of forestry will have to be replaced by replanting an area of equivalent size at an alternative site.

Implementation and management measures are outlined in Appendix 6-5 and summarised below:

- All trees within Woodland Planting Block B will be felled using conventional forestry harvesting approaches/machinery and with specific reference to Macklin et al. 2017.
- Timber and brash will be gathered and removed from the Proposed Wind Farm site post felling.
- The machine operators used will be experienced at working on deep peat and made aware of the specific risks on the Proposed Wind Farm site.
- The Proposed Wind Farm site will be walked prior to commencement of works.
- The use of off-road vehicles on the Proposed Wind Farm site will be restricted to the proposed new site access track unless where specifically required to access the areas to be felled
- These works will also be preceded by a toolbox talk to the felling team by the ECoW to ensure all measures are implemented in full.
- Burning and dumping will not be permitted.

The native woodland planting measures proposed for all five blocks will be implemented as follows:

- Planting areas will be clearly marked prior to works to define the extent of planting.
- Thin stakes or sticks will be used to mark the rows or areas of trees to be planted.
- Trees will generally be planted at approximately 2 m spacing. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row.
- Newly planted trees will be protected as required using appropriate tree guards to prevent browsing by wild animals such as deer.
- New tree planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible.
- During spring and autumn maintenance periods all trees and plants will be checked and adjusted as required, soil firmed, and any dead wood present removed back to healthy tissue. If there is significant failure, the need for replacement planting will be

assessed. Where tree guards are no longer required these will be removed to avoid damage to the tree.

- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August.
- Trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report (see Section 5 of Appendix 6-5).

2.3.5.3 Best Practice Measures

A number of biodiversity enhancement measures are outlined in Section 4.8 of Appendix 6-5 and summarised below. These measures are not required to mitigate or offset identified significant effects.

Enhancement of Pollinator Foraging Habitat

No significant effects on supporting habitat for pollinating insects was identified within the EIAR. Nonetheless, there is an opportunity to create areas of high quality, flower rich grassland habitat along the verges of the proposed internal roads associated with the Proposed Project and to manage existing areas of cutover bog, wet grassland and dry meadows and grassy verge habitat along these proposed roads for increased floral diversity. This will benefit pollinators by providing flower rich foraging resources and improved habitat connectivity.

Two areas for habitat creation and enhancement have been identified. The first starts in Lullybeg just south of T37 continuing south along proposed internal roads past T34 into Barnaran, west along the old railway tracks entering Blackriver and then north along proposed internal site access roads past T07 (refer to Map 6-5-3 of Appendix 6-5). The second area starts in the north of the Proposed Wind Farm site in Ticknevin and continues along proposed roads joining T32 and T30, finally connecting to the Long Derries, Edenderry SAC.

Refer to Section 4.8.1 of Appendix 6-5 for further detail on implementation and management of these best practice measures.

Falcon Nest Boxes

As outlined in in Section 7.3.7.11 and 7.3.7.20 of the EIAR, peregrine and kestrel are resident at the Proposed Wind Farm site and breeding in the area. Although no significant impacts are anticipated for these species, both of these species can be limited by the lack of available suitable breeding locations in an Irish context. It is therefore proposed to bolster the population of these peregrine and kestrel by providing additional nesting sites in the form of nest boxes. For peregrine, it is proposed to install two nest boxes at suitable locations outside the buffer of disturbance for this species (750m). For kestrel, it is proposed to provide nest boxes at a ratio of 5:1 relative to the potential collision risk mortality, or 25 nest boxes and these will be placed within the Core Ornithological Survey Area, but at sufficient distances from the Proposed Turbines to avoid impacts. Peregrine and kestrel are known to readily accept nest boxes. Nest boxes will be placed in the winter before the first breeding season of the construction phase.

Log and Brash Piles

Log and brash habitat piles will be created within areas following birch woodland felling and scrub removal. These areas will be located outside of any areas proposed for permanent infrastructure. Where suitable, woody material arising from necessary vegetation removal associated with the Proposed Project will be retained and reused for this purpose.

The habitat piles will comprise untreated logs, branches and brash of varying sizes, with bark retained where possible, to provide a range of microhabitats for invertebrates, small mammals, small birds, other fauna and fungi (Browne, 2020). The piles will be located away from routinely trafficked areas and will remain in situ throughout the operational phase of the Proposed Project.

Bat Boxes

As a range of bat species are known to utilise the Proposed Wind Farm site for commuting and foraging, artificial roosting features will be incorporated within the Proposed Wind Farm site to enhance roost availability and strengthen the ecological functionality of the landscape for bats. The enhancement measures will comprise a minimum of 15 no. bat boxes.

The precise location of all artificial roosting features will be agreed with a suitably qualified ecologist prior to installation. In accordance with national guidance, bat boxes will be installed in clusters on mature trees or dedicated poles within woodland, treelines and other sheltered linear features that form existing commuting corridors, and away from artificial lighting and other potential sources of disturbance. Boxes will be installed at a minimum height of 3m above ground level and on a range of aspects to provide a variety of microclimatic conditions. Boxes will include a mix of crevice-type and cavity-type design.

Amenity Development

The Proposed Project includes 55.2km of amenity track which is described in Chapter 4 of this EIAR. The potential for significant disturbance to wildlife as a result of the use of the proposed amenity track and boardwalk by the public during the operational phase of the Proposed Project was considered and assessed in Section 6.4.3.2 of Chapter 6 of the EIAR.

The following measures will ensure that disturbance to wildlife and encroachment on to sensitive habitats is avoided or kept to a minimum:

- Dog control management (dogs on leads) will be included on all signage, as required.
- The amenity tracks have been designed to avoid areas identified as suitable for marsh fritillary and construction activities will be supervised by the ECoW, ensuring minor micro-siting as required.
- The amenity pathways will include educational signage with information on the habitats, species and general biodiversity of Ballydermot Bogs and the habitat enhancement work being undertaken by BnM on the Project Site.
- Proposed Amenity Tracks that are located nearby waterbird breeding or roosting locations will be screened. Visual screening fences will be installed at selected locations along the amenity roads and tracks, to prevent disturbance to breeding and non-breeding birds using the site during the operation phase (occasional movement of people, dogs). The screening fence will be approximately 1m high. A dense hedgerow comprising native species may be planted to enhance privacy and visual appeal also. Indicative areas of where screens will be implemented are presented in Figure 6-5-9 in Appendix 6-5. The actual number and location of screening required will be assessed during the construction phase by the ECoW.

Pine Marten and Red Squirrel Boxes

Pine marten were recorded on trail camera footage in the woodland North of T28 in Glashabaun North Bog, south of T35 in Lullybeg Bog and north-west of T11 in Ballydermot South Bog. Red squirrel were observed in Ballydermot North Bog, Blackriver Bog, Killina Bog and in Lullymore Heritage Park. Other incidental records of these species occurring within and outside the Project Site were also noted in the Biodiversity chapter. No breeding sites for either species were recorded within the footprint of the Proposed Project by surveyors

However, the Proposed Project presents an opportunity to provide enhancement measures for these species in the form of artificial breeding sites. These den/nest boxes act to provide artificial breeding sites facilitating the raising of young during the spring and summer, in addition to providing shelter from environmental conditions and predators.

Proposed Nest/Den Box Installation

It is proposed to erect five pine marten den boxes within Glashabaun North, Glashabaun South, Ballydermot South and Barnaran and five red squirrel nest boxes in Killina and within the proposed Native Tree (Woodland and Scrub) Planting Blocks. These will be erected immediately post construction (to avoid disturbance to these species during construction). They will be erected along existing mature trees within these area and in suitable locations where future tree felling (associated with forestry) will not occur.

Tree Selection

Boxes will not be installed until after the Proposed Project has been constructed, this will allow an optimal location to be identified. Selection of a suitable tree will require the installer to seek out a tree that they deem to be fit for the purpose. Although these guidelines were provided in relation to pine marten den boxes the same would apply in relation to the installation of red squirrel nest boxes. Guidelines for installation are listed in Section 4.8.6.1.1 of Appendix 6-5.

Embankments for Solitary Bees and Pollinators

Safe places for bees to nest are crucial to the survival of each species. Adult solitary bees die in autumn, leaving the next generation behind as pupae in nests to emerge as adults the following spring. Mining solitary bees nest by making tiny burrows in bare earth. It is proposed to use excavated subsoil from the construction of the Proposed Project to construct short sections of embankments/berms at locations within the two pollinator foraging habitat areas that are proposed for enhancement. These berms will be allowed to become recolonised by vegetation naturally to ensure the local seedbank is preserved and provide additional foraging resources for pollinating insects. However, it is also proposed to maintain the south-facing embankment slopes free of vegetation to provide bare soil for nesting solitary bee species. An example of an embankment used by solitary bees is provided in Plate 6-5-6 in Appendix 6-5 with examples of pollinators present within the Project Site shown within Plate 6-5-7 and Plate 6-5-8 in Appendix 6-5. Management and implementation measures are detailed in Section 4.9.7 of Appendix 6-5.

2.3.6 Turbine Delivery Route Accommodation Works

Road and junction widening are sometimes required along the Proposed Turbine Delivery Route to accommodate the large vehicles used to transport turbine components to the Proposed Wind Farm. The Proposed Turbine Delivery Route for the Proposed Project has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1.14 of this EIAR and summarised below. There are sections on the route where the vertical alignment may require specialist transport vehicles. These sections will be further considered by the appointed transport company following the

turbine procurement process. Accommodation works will be required at various locations on the national and regional road network between the port of arrival in Galway and the Proposed Wind Farm. These will be limited to temporary measures including temporary local road widening, overruns of roundabout island and temporary relocation of some signs and street furniture.

Location 1 – M6 East / N52 Roundabout and N52 / M6 West Roundabout

Dwg Nos. 414429-60A1.2 and Dwg Nos. 414429-70A1.1 as shown in Appendix 4-3

The abnormally sized loads will undertake a three point turn at the northern M6 East / N52 Roundabout. At this location the roundabout centre island and 2 splitter islands will be levelled and surfaced to provide temporary routes for the abnormally sized loads. The temporary removal of bollards, road signs, a lamp post and some trees will be required.

At the southern N52 / M6 West Roundabout the abnormally sized loads will drive through the centre island of the roundabout. At this location the route through the roundabout centre island will be levelled and surfaced to provide the temporary route for the abnormally sized loads. It is noted that this resurfacing is already in place. The temporary removal of road signs will be required.

Location 2 – N52 Arden Roundabout

Dwg No. 414429-80A1.1 as shown in Appendix 4-3

At this roundabout the abnormally sized loads will drive on a temporary route proposed on the eastern side of the roundabout centre island that will connect the N52 north and N52 south arms of the roundabout. The route through the roundabout centre island will be levelled and surfaced to provide for the abnormally sized loads.

Location 3 – N52 / L2025 Cappancur Roundabout

Dwg No. 414429-90A1.2 as shown in Appendix 4-3

It is proposed that the abnormally sized loads will travel contraflow through this roundabout. It is also proposed that they will drive on a temporary route proposed on the western side of the roundabout centre island that will connect the N52 north and N52 south arms of the roundabout. The route through the roundabout centre island will be levelled and surfaced to provide for the abnormally sized loads. The temporary removal of one road signs will be required.

Location 4 – N52 / R420 Cloncollog Roundabout

Dwg No. 414429-300A1.1 as shown in Appendix 4-3

It is proposed that the eastern section of the centre island of this roundabout will be temporarily levelled and surfaced to provide for the abnormally sized loads travelling from the N52 north arm to the R420 southeastern arm of the roundabout. The temporary removal of road signs and a lamp post will be required.

Location 5 – R420 / R402 Junction Autotrack Assessment

Dwg No. 414429-310A1.1 as shown in Appendix 4-3

It is noted that significant temporary works have been undertaken for the delivery of turbine components at this location which have since been fenced off.

The extent of the area on the northeast corner of the junction that will be surfaced to accommodate the wheels of the abnormally sized delivery vehicles, is illustrated, as is the additional are that is required to be cleared to facilitate overhang of the blade. The temporary removal of road signs an electricity pole, trees and existing boundary will be required.

Location 6 – R402 / L2025 Junction in Ballingar Autotrack Assessment

Dwg No. 414429-320A1.3 as shown in Appendix 4-3

An area on the western side of the R402 comprising of third-party land and a public park, will be required temporarily to provide an over-run area for the delivery of the abnormally sized loads, with an additional area required to provide for oversail of the blade tip. In this area trees, 2 poles, a hedgerow, a fence, a wall and road signs will be temporarily removed. To the east of the junction with the L2025, a splitter island and associated street furniture will also be removed temporarily.

Location 7 – Left bend on R402 in Ballingar Autotrack Assessment

Dwg No. 414429-140A1.1 as shown in Appendix 4-3

At this left hand band on the R402 one electricity pole located on the north side of the road will be temporarily removed in order to facilitate blade overhang of the northern carriageway edge.

Location 8 – Right bend on R402 in Daingean Autotrack Assessment

Dwg No. 414429-150A1.1 as shown in Appendix 4-3

In order to accommodate the abnormally sized vehicles at the right hand bend on the R402 in Daingean a narrow section of temporary road widening will be implemented on the northern side of the road. The assessment also shows an area on the west side of the R402 that will be cleared temporarily of all obstructions to facilitate oversail of the blade time, and similarly an area on the south east corner of the bend that will be cleared to accommodate overhang of the blade. During the delivery period, on-street parking restrictions will be required in addition to the removal of a lamp post, an electricity pole and the pruning of some trees.

Location 9 – R402 / L1003 Junction Autotrack Assessment

Dwg No. 414429-160A1.1 as shown in Appendix 4-3

At this junction the autotrack assessment shows that the tip of the blade will oversail the northern carriageway edge of the R402 but will not extend beyond the existing boundary fence. The assessment also shows that the body of the blade will overhang the south western corner of the R402/ L1003 junction into third party lands. During the delivery period, a telegraph and 2 road signs will be removed on the southwest corner of the junction.

Location 10 – L1003 / Cloncreen Wind Farm Junction Autotrack Assessment

Dwg No. 414429-170A1.2 as shown in Appendix 4-3

It is proposed that the abnormally sized delivery vehicles will enter the Cloncreen Wind Farm at the existing access off the eastern side of the L1003. The autotrack assessment shows that an addition to the existing access road and area on the eastern side of the L1003 and to the south of the existing access will be temporarily surfaces in order to accommodate the largest vehicles. In addition, a short strip to the north of the existing access road will be cleared of any obstruction to accommodate overhang of the blade. A narrow strip on the west side of the L1003 to the north of the access road will also be kept clear to permit minor oversail of the blade tip across the western carriageway edge. Existing boundary features at the temporary access will also be removed.

Remaining Route to Site Entrance 1A

The abnormally sized loads will then travel east via the internal road network of the Cloncreen Wind Farm, with minor temporary remedial works required at 2 locations to accommodate the abnormally sized loads generated by the Proposed Project, as shown in Drawing Nos. 414429-230A1.1 and 414429-240A1.1 of the report prepared by Collett & Sons Ltd and included as Appendix 15-3.

The Proposed Turbine Delivery Route then enters the Proposed Wind Farm site by means of a crossing of the R401 (Site Entrance 1A), with the loads abnormally sized loads distributed through the Proposed Wind Farm site via crossings of the L3001 (Site Entrance 2B) and the L1001 (Site Entrance 3D and Site Entrance 3E), as shown in Figure 15-2. It is noted that all 3 of these locations are straight crossing and are accommodated within the proposed junction designs.

3. ENVIRONMENTAL MANAGEMENT

3.1 Introduction

This CEMP includes all best practice measures required to construct the Proposed Project. The drainage proposals will be developed further prior to the commencement of construction however, any such improvements will be in line with the principles set out here and will also be in full compliance with the planning consent and mitigation measures as presented in the EIAR, NIS and all other relevant planning documents.

The following sections give an overview of the drainage design principles, archaeological management, traffic management, dust and noise control measures, invasive species management and a resource & waste management plan for the Project Site.

3.2 Protecting Water Quality

3.2.1 Good Environmental Management During Construction

Timing of works can strongly influence the potential for damaging the freshwater environment. Operations during wetter periods of the year pose a significantly greater risk of causing erosion and siltation, which can be particularly severe following major rainfall or snowmelt events. Traditionally, wind farm construction undertaken during the drier summer months would result in significantly less erosion and siltation. Construction activities in the hydrological buffer zones shall be avoided during or after prolonged rainfall or an intense rainfall event and work will cease entirely near watercourses when it is evident that water quality is being impacted.

3.2.2 Site Drainage Principles

The site drainage features have been outlined in Section 4.7 in Chapter 4 of the EIAR for the Proposed Project and in the Surface Water Management Plan, submitted as Appendix 4-6 of the EIAR, in addition to the drainage design and management for the Proposed Project The protection of the groundwater and surface water within and surrounding the Project Site, and downstream catchments is a critical aspect of establishing the most appropriate drainage proposals for the Proposed Project. The routes of any natural drainage features will not be altered as part of the Proposed Project. Proposed Turbine locations have been selected to avoid natural watercourses where possible. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e., 50m. Buffer zones of 50m around the existing natural watercourses have been used to inform the layout of the Proposed Project.

A detailed drainage design for the Proposed Project will be prepared prior to the commencement of construction to incorporate these site drainage principles and carry forward into the construction phase of the Proposed Project.

3.2.3 Legislation and Best Practice Guidance for Protecting Water Quality

The drainage design presented in the EIAR and planning application documents has been prepared based on experience of the project team of other renewable energy sites in similar environments, and the number of best practice guidance documents.

There is no one guidance document that deals with drainage management and water quality controls for wind farms and other renewable energy developments. However, a selection of good practice approaches have been adopted in preparation of this CEMP, and these are taken from the various best practice guidance documents listed below. These relate to infrastructure and operational works on sites, road design, water quality controls for linear projects, road drainage and management of geotechnical risks. To achieve best practice in terms of water protection through construction management, the detailed drainage design and all drainage management proposals shall be prepared in accordance with guidance contained in the following:

- Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive);
- Environmental Protection Agency (2022): Guidelines on the information to be contained in Environmental Impact Assessment Reports;
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- DoE/NIEA (2015): Wind farms and groundwater impacts - A guide to EIA and Planning considerations";
- OPW (2009) The Planning System and Flood Risk Management;
- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Wind Energy Development Guidelines for Planning Authorities, 2006 (the DoEHLG 2006 Guidelines) and the Draft Revised Wind Energy Development Guidelines (Draft DoHLGH 2019 Guidelines);
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);
- PPG5 – Works or Maintenance in or Near Water Courses (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);
- Wind Farms and Groundwater Impacts: A guide to EIA and Planning considerations (DoE/NIEA, April 2015);
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001;
- Land Types for Afforestation (Forest Service, 2016b):
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b); and,
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plant 2018-2021 (DAFM, 2018).

3.2.4 Site Drainage Design and Management

The proposed site drainage features for the Project Site are outlined in Section 4.7 in Chapter 4 of the EIAR as well as the accompanying Surface Water Management Plan (SWMP, Appendix 4-6) and Drainage Drawings (Appendix 4-5). The following sections give an outline of drainage management

arrangements in terms of pre-construction and construction phases of the Proposed Project however, the dedicated SWMP (Appendix 4-6) should be consulted for additional information on the proposed drainage design and management principles.

3.2.4.1 Pre-Construction Drainage

Prior to commencement of works in sub-catchments across the Project Site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the Project Site, as works in all areas will not commence simultaneously.

The routes of any natural drainage features will not be altered as part of the Proposed Project. Proposed Turbine locations have been selected to avoid natural watercourses where possible. Within the Proposed Wind Farm, there are a total of 15 no. watercourse crossing locations over natural watercourses (rivers and streams). There are 2 no. crossing locations over the Figile River and will be upgraded with a clear span bridge.

There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e., 50m. Buffer zones of 50m around the existing natural watercourses have been used to inform the layout of the Proposed Project.

The drainage proposed within the part of the Project Site under IPC Licence will not significantly alter the existing drainage regime within the Allen Bog Group. Moreover, the proposed drainage system will be fully integrated into the existing bog drainage systems. Existing field drains and main drains will be routed under/around access tracks using culverts as required.

3.2.4.2 Construction Phase Drainage

Runoff control and drainage management are key elements in terms of mitigation measures to reduce potential effects on downstream surface water bodies. Drainage management within the Project Site will be risk based, and will employ various SuDs methods, building on the existing drainage systems within the Proposed Wind Farm site where available and appropriate.

The drainage design principles are outlined in Section 4.7.3 of Chapter of the EIAR with drainage design measures outlined in Section 4.7.4 of Chapter of the EIAR.

The main tenet of the proposed drainage plan is ensuring to ‘keep clean water clean’ by avoiding unnecessary or significant disturbance to existing drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas through the construction of interceptor drains. Where possible (depending on orientation), existing field drains can be used as interceptors drains, otherwise, new interceptor drains will be excavated locally, and new drains will outfall to existing field drains downstream of the works areas.

The second method involves collecting any construction area drainage waters (from turbine base/hardstand areas, temporary construction compounds, and the substations) and routing that water through new Proposed Project settlement ponds (or stilling ponds) prior to controlled release into the existing drainage network (field drains or main drains as required/available). There will be no discharges to the existing drainage network without prior treatment.

Within the Proposed Wind Farm site, the majority of the roads will be constructed using a floated technique. In these sections, and depending on intermediate topography, a collector drain (dirty water

system as described above) will be used during construction phase, or over the edge (OTE) drainage will occur. OTE drainage allows runoff from access tracks to flow overland and onwards into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, and it is only proposed in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations). Silt traps and check dams will be installed in existing field drains downstream of OTE drainage areas, and these will provide attenuation and treatment of dirty water.

During the construction phase, all runoff from works areas (i.e., dirty water) will be attenuated and treated prior to being released within the Project Site. All drainage outfall from the bogs associated with the Proposed Wind Farm and the Proposed Onsite Substation is routed through existing IPC licence settlement ponds that will remain in-situ. Drainage systems will also be put in place at the Proposed Offsite Substation to ensure that there is no discharge of untreated or unattenuated water.

3.2.5 Preparative Site Drainage Management

All materials and equipment necessary to implement the drainage measures detailed above, will be brought onsite in phases as they are required during the construction phase. A sufficient number of straw bales, clean drainage stone, terram, stakes, etc., will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures detailed in the above will be installed prior to, or at the same time as the works they are intended to drain.

3.2.5.1 Pre-emptive Site Drainage Management

The works programme for the groundworks part of the construction phase of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular, working under a schedule of works operation system (SOWOR) system as proposed in the planning application; further detail is provided in Appendix 4-6. Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast, detailed in Section 3.2.7 below.

3.2.5.2 Reactive Site Drainage Management

The final drainage design prepared for the Proposed Project prior to commencement of construction will provide for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW on-site. The ECoW or Project Hydrologist will respond to changing weather, ground or drainage conditions on the ground as the Proposed Project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time.

In the event that works are giving rise to siltation of watercourses, the ECoW will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

3.2.6 Cable Trench Drainage

Cable trenches are proposed to be constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and

backfilled with the appropriate materials, before work on the next section commences. This operation normally occurs over a period of 2-4 hours.

To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be backfilled into the existing trench

On steeper slopes, silt fences, as detailed in Section 4.7.4.7 in Chapter 4 of the EIAR, will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control run-off.

3.2.7 Rainfall Forecasting and Monitoring

Accurate forecasting and monitoring of rainfall is critical to the successful pre-emptive and reactive site drainage management as outlined in the subsections above.

Rainfall forecasts will be obtained for the nearest forecast reference point available via the www.yr.no weather forecasting website. The reference location will be that of Edenderry, Co. Offaly.

https://www.yr.no/en/forecast/daily-table/2-2964436/Ireland/Leinster/County%20Offaly/Edenderry

Construction personnel will be required to check the forecasted rainfall for the days ahead and plan for or suspend planned works accordingly. The forecasted rainfall should be recorded for reference and comparison with the rainfall levels to be recorded on-site.

Actual rainfall will be monitored on Project Site, ideally via an automated rain gauge or weather station with regular recording intervals recommended by the Project Hydrologist and a means of alerting the construction personnel of rainfall trigger levels. Any recorded rainfall data should be available on site at all times for review by the ECoW, Project Hydrologist or any regulatory authorities. The appointed contractor will be required to outline their proposed means of recording rainfall on site to the satisfaction of the ECoW and the Project Hydrologist prior to commencement of works.

The following forecasting systems are available and will be used on a daily/weekly basis, as required, to allow site staff to direct proposed and planned construction activities:

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

Using the safe threshold rainfall values will allow planned works to be safely executed (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests any of the following is likely to occur:

- >10 mm/hr (i.e. high intensity local rainfall events);
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures shall be completed:

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface runoff; and,

Avoid working during heavy rainfall (listed above) and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.

3.2.8 Refuelling, Fuel and Hazardous Materials Storage

Wherever possible, vehicles will be refuelled off-site. This will be the case for regular, road-going vehicles. However, for construction machinery that will be based on-site continuously, a limited amount of fuel will have to be stored on site in appropriately bunded containers.

On-site refuelling of machinery will be carried out at dedicated refuelling locations using a mobile double-skinned fuel bowser. The fuel bowser, a double-axle, custom-built refuelling trailer, will be re-filled off site and will be towed around the Project Site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the Proposed Project. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use.

Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays, spill kits and fuel absorbent mats will be used during all onsite refuelling operations.

The following mitigation measures are proposed to avoid release of hydrocarbons at the Project Site:

- Refuelling and maintenance of construction vehicles and plant will, where practicable, be undertaken off-site at controlled, designated fuelling facilities. Where refuelling or maintenance is required on-site, it will be undertaken at designated areas in accordance with the CEMP and appropriate pollution prevention procedures;
- On-site re-fuelling will be undertaken using a double skinned bowser or a refuelling truck with spill kits kept onboard;
- Only designated trained operatives will be authorised to refuel plant on-site;
- Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system;
- All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;
- Fuel and oil stores including tanks and drums will be regularly inspected by the appointed EnvCoW for leaks and signs of damage;
- The Proposed Onsite Substation and the Proposed Offsite Substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;

- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 6 of this CEMP).

3.2.9 Cement Based Products Control Measures

Concrete and other cement-based products are highly alkaline and corrosive and can have significant negative impacts on water quality. They generate very fine, highly alkaline silt (pH 11.5) that can physically damage fish by burning their skin and blocking their gills.

Where concrete is delivered on Project Site, only the chute will be cleaned, using the smallest volume of water possible. The small volume of water that will be generated from washing of the concrete truck's chute will be directed into a temporary, lined, impermeable containment area for concrete washout. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown in Plate 1 and Plate 2 below.



Plate 1 Concrete washout area



Plate 2 Concrete washout area

The areas will be covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site. Any solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste.

Alternatively, a Siltbuster-type concrete wash unit or equivalent[5] may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site at an appropriate waste facility.

The risks of pollution arising from concrete deliveries will be further reduced by the following:

- No batching of wet-cement products will occur on-site. Ready-mixed concrete will be delivered to site, and where possible, pre-cast elements will be used;
- Where possible pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on-site, only the chute will be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be isolated in temporary lined wash-out pits located near proposed site compounds. These temporary lined wash-out pits will be removed from the site at the end of the construction phase;
- Any washing out of concrete pumping plant will also be into the temporary lined wash-out pits;
- The appointed contractor will ensure to use weather forecasting to plan dry days for pouring concrete; and,
- The appointed contractor will ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries may be required outside normal working hours to limit the traffic impact on other road users, particularly peak period school and work commuter traffic. Such activities are limited to the day of turbine foundation concrete pours, which are normally completed in a single day per turbine.

3.2.10 Clear Felled Forestry and Vegetation Removal Drainage Measures

As discussed in Section 2.3.3.10 above, clear-felled forestry and vegetation removal will be required within and around the Proposed Project footprint to allow for the construction of the turbine bases, access roads, the Proposed Onsite Substation, underground cabling, and other ancillary infrastructure and for the Proposed Enhancement areas. A total of 60.7ha of forestry (comprising conifer plantation (WD4) will be permanently clear-felled.

The felling activities required as part of the Proposed Project will be the subject of a LFL application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The Forest Service policy requires that planning permission for the Proposed Project is available prior to determination of the associated felling licence application. Where replacement afforestation is required by the Forest Service as part of the felling licence process, the replacement afforestation lands will also be subject to the applicable statutory forestry consent process.

During clear-felling and vegetation removal there is a potential to generate silts and sediments in surface water runoff due to tracking of machinery and disturbance of the ground surface etc. Mitigation is provided in Section 9.5.2.12 of Chapter 9 Water with regard surface water quality protection for this activity and is summarised below.

[5] https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/

Prior to the commencement of subsequent road construction the following key temporary drainage measures will be installed:

- Interceptor drains will convey clean runoff water around works areas to the existing downstream drainage system (field drains and main drains).
- Silt traps and check dams will be installed in field drains downstream of over the edge (OTE) drainage areas, and these will provide attenuation and treatment of dirty water.
- Silt fences will be emplaced within drains down-gradient of all construction areas.

Before the commencement of any vegetation removal works, an EnvCoW shall be appointed to oversee the works. The EnvCoW shall be experienced and competent, and shall have the following functions as proposed in the planning application:

- Attend the Project Site for the setup period when drainage protection works are being installed and be present on site during the remainder of the works.
- Prior to the commencement of works, review and agree the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals (see further below).
- Be responsible for preparing and delivering the Environmental Toolbox Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works.
- Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with the proposals outlined in Section 4.2 of this CEMP.
- Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures.
- Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements:
- Sampling shall be taken from the stream/riverbank, with no in-stream access permitted.
- The following analytical suite of parameters shall be tested by an independent and INAB accredited laboratory at a minimum: pH, Electrical Conductivity (EC), Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), Total Phosphorus, Ortho-Phosphate, Total Nitrogen, and Ammonia.
- Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions.
- Prepare and maintain a contingency plan.
- Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed.
- Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.

Mitigation by Avoidance:

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" are shown in Table 9-23 in chapter 9 of the EIAR.

The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:

- Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment;

- Avoid soil disturbance and compaction within close proximity to surface watercourses;
- Avoid the entry of suspended sediment from works into watercourses; and,
- Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Table 3-1 Minimum Buffer Zone Widths (Forest Service, 2000) (Table 9-26 in Chapter 9 of the EIAR)

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 – 15%)	10 m	15 m
Steep	(15 – 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during felling works:

Mitigation by Design:

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release into surface watercourses comprise best practice methods which are set out as follows:

- Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance;
- All machinery will be operated by suitably qualified personnel;
- Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works;
- Machines will traverse the Project Site along specified off-road routes (referred to as racks);
- The location of racks will be chosen to avoid wet and potentially sensitive areas;
- Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when mats become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat and spoil areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
- In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on Site during construction;
- Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses;

- Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded;
- Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites;
- Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff;
- Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,
- Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.

Silt Traps:

Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner.

Timing of Proposed Project Felling Works:

Felling will only be carried out during periods of no or low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.

Drain Inspection and Maintenance:

The following items will be carried out during pre-felling inspections and after:

- Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines;
- Inspection of all areas reported as having unusual ground conditions;
- Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall;
- Following tree felling all main drains will be inspected to ensure that they are functioning;
- Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- Culverts on drains exiting the Site, if impeded by silt or debris, will be unblocked; and,
- All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

Surface Water Quality Monitoring:

Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings

as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).

Criteria for the selection of water sampling points include the following:

- Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses;
- Select sampling points upstream and downstream of the forestry activities;
- It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry;
- Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and,
- The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed.

Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near a watercourse (to be completed by the EnvCoW). These will be kept on site for record and inspection.

3.3 Archaeological Management

This section of the CEMP provides an outline of the Cultural Heritage mitigation measures for the construction phase of the Proposed Project.

There are no UNESCO World Heritage Sites (WHS) or National Monuments located within or along the Project Site. One UNESCO WHS Tentative List site is located within the Cultural Heritage Visual Study Area, 20km from the nearest Proposed Turbine (T1), and comprises Dún Ailinne (Figure 14-2 of Chapter 14 of the EIAR).

No National Monuments or those subject to a Preservation Order are located within the Cultural Heritage Study Area. Two National Monuments in State Care and four monuments subject to a Preservation Order are located within 15km of the nearest Proposed Turbine and are listed in Table 14-5 and Table 14-6 and shown on Figure 14-4. The nearest National Monument comprises Grange Castle which is located c. 7.2km north-west of the nearest Proposed Turbine, i.e., T32 while the nearest monument subject to a Preservation Order comprises the ecclesiastical site at Lullymore East which is situated c. 2.5km from the nearest Proposed Turbine, i.e., T1.

Nine recorded monuments are located within the Cultural Heritage Study Area in the vicinity of the Proposed Wind Farm. Three of the monuments (KD012-002001-, KD012-003001-, and KD012-004001-) were partially excavated by Etienne Rynne in 1964-5 after the discovery of the toghers was reported by BnM. At least one of these monuments (KD012-016—) was identified as a result of a peatland survey carried out within the part of the Project Site located on part of the Allen Bog Group by the Irish Archaeological Wetland Unit (IAWU) in 1997-8, while the remaining monuments were recorded during the subsequent 2004 Peatland Survey undertaken by ADS Ltd., as part of the Archaeological Survey of Ireland Peatland Survey (Whitaker, 2004). During that survey a total of 83 sightings of archaeological material were made, the majority of which (55) comprised occurrences of single worked brushwood or roundwoods. It was thought at the time of the survey, and confirmed by subsequent dating, that many of the sightings were modern in origin.

The following pre-construction measures will be adhered to:

- Archaeological monitoring under licence from the National Monuments Service (NMS) of any further geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.
- Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. Peat depth data and local ground conditions may dictate the number and location of test trenches to be excavated. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented, where relevant, following consultation with the NMS.
- Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS will be carried out by a suitably qualified archaeologist. Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.

There is only one instance where Proposed Project infrastructure interacts with a recorded monument where the proposed road to T46 crosses the line of Class 1 togher KD012-002001- which extends from higher ground in Ticknevin townland to the north and Derrybrennan townland to the south.

Archaeological monitoring will be ongoing during the construction phase of the Proposed Project which is outlined below:

- Archaeological monitoring of ground works associated with the proposed new floating road to T46 where such works interact with the location of recorded monument KD012-002001- will be undertaken. Archaeological monitoring of any ground works proposed within the Proposed Enhancement Areas within Lodge Bog in the immediate vicinity of the recorded location of recorded monuments KD012-019— Platform – peatland and KD012-018— Structure – peatland and within approximately 20m radius of same. The monitoring will be carried out under licence from the National Monuments Service (NMS). A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority/Body. Should archaeological finds, features or deposits be uncovered during the monitoring further mitigation such as preservation in situ or preservation by record (excavation) may be required and will be carried out in consultation with the NMS.
- Archaeological monitoring of ground works associated with the Proposed Grid Connection where it extends through the ZoN for KD013-017— Ringfort – rath will be undertaken. The monitoring will be carried out under licence from the National Monuments Service (NMS). A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority/Body. Should archaeological finds, features or deposits be uncovered during the monitoring

further mitigation such as preservation in situ or preservation by record (excavation) may be required and will be carried out in consultation with the NMS.

3.4 Traffic Management

This section of the CEMP provides an outline of the traffic management proposals for the construction phase of the Proposed Project. In the event planning permission is granted the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

3.4.1 Turbine and Materials Transport Route

3.4.1.1 Proposed Project

There are a number of ports on the island of Ireland that have proven capability to accept and store large wind turbine components such as Cork, Shannon Foynes, Galway and Dublin ports. Furthermore, subsequent access to the national motorway network during transportation from these ports has been demonstrated. The facilities within the ports and access to and from the ports is continually being upgraded as part of general improvements. It is on this basis that it is not foreseen that the Proposed Project will result in any material change to the port selected should it be consented and enter into the construction phase.

For the purposes of this EIAR, Galway Port has been selected and assessed to facilitate turbine delivery to the Project Site. Galway Port is regularly used for the delivery of wind turbine components, and the transport of abnormal loads from the port to the national motorway network is well established. A detailed swept path analysis has confirmed that the Proposed Turbine Delivery Route from Galway Port to the M6 motorway can accommodate the Proposed Turbine components without the need for substantive accommodation works.

Prior to the commencement of turbine component delivery, the final port of entry will be confirmed following a detailed review of Irish ports and their capacity to facilitate the transport of the Proposed Project's turbine components via the national motorway network.

It is proposed that the large wind turbine components will be delivered to the Project Site via the M6, exiting south at Junction 5 (Tullamore/Kilbeggan) onto the N52, and travelling south towards Tullamore. Turbine delivery vehicles will continue southeast along R420 regional road before turning northeast along the R402 east of Daingean toward the entrance of the existing Cloncreen Wind Farm. Turbine delivery vehicles will progress through the existing Cloncreen Wind Farm before reaching Site Entrance 1A. Please note, abnormal loads will utilise the internal access roads and associated site entrances (see Table 4-7 in Chapter 4 of the EIAR) in order to ensure delivery of all Proposed Turbine components. The Proposed Turbine Delivery Route is shown on Figure 4-53 in Chapter 4 of the EIAR. All deliveries of turbine components to the Project Site will only be by way of the Proposed Turbine Delivery Route detailed in Figure 4-53 in Chapter 4 of the EIAR.

The route identified for abnormal load delivery has been previously utilised for the delivery of turbine components to the now operational Cloncreen Wind Farm. Turbine delivery during the construction phase of Cloncreen Wind Farm was successful and therefore this route has been considered for the Proposed Wind Farm, subject to further assessment relevant to present conditions and the Proposed Turbines.

All other construction materials will be delivered to the Project Site via the Proposed Construction Haul Routes shown on Figure 4-53 in Chapter 4 of the EIAR and will access the Project Site using the appropriate site entrance based on the source of the construction material, detailed in Table 4-7 in Chapter 4 of the EIAR, which will be included in the TMP for the Proposed Project, included as

Appendix 15-2 to the EIAR. Traffic movements generated by the Proposed Project are discussed in in Section 15.1 of Chapter 15 of the EIAR.

3.4.2 Deliveries of Stone and Ready-Mix Concrete from Quarries

Construction materials will be delivered to the Project Site via selected Proposed Construction Haul Routes, these have been determined based on the identified proposed source of the construction material. All crushed stone, hardcore materials and ready-mix concrete that will be required during the construction phase will be sourced from local, appropriately authorised quarries. There are no borrow pits proposed as part of the Proposed Project. For the purposes of assessment within the EIAR, 9 no. existing, authorised quarries, with the required capacity and material available have been identified in the locality, located within 20km of the Project Site have been selected and assessed as part of this EIAR. Refer to Figure 4-52 in Chapter 4 of the EIAR.

It is envisaged that general construction traffic (including materials and staff) will travel to the Project Site via the public road network to the relevant construction site access points, detailed above.

Site Entrance 6L and Site Entrance 7M will facilitate access to the Proposed Onsite Substation. Site Entrance 8M will facilitate access to the Proposed Offsite Substation. Please refer to Table 4-7 in Chapter 4 of the EIAR for further information on site entrances. The Proposed Construction Haul Routes for HGVs from each identified quarry to the closest relevant site entrance location is provided below. Deliveries of stone and ready-mix concrete for use in construction of the Proposed Project, are discussed in further detail in Chapter 15 of the EIAR.

Roadstone Quarry, Derrygreenagh Co. Offaly

HGVs will depart from Roadstone Quarry in the townland of Derrygreenagh, Co. Offaly and turn left onto the R400 regional road. They will travel for 6.3 km before taking the second exit at the roundabout to continue on the R400. After travelling south on the R400 for 1.6 km the HGVs will turn left on to the R401. They will continue on the R401 for 9.4 km before taking the second exit on the roundabout to continue on the R401 for 400 m. The HGVs will then turn right and travel for 900 m before turning right onto the R402. They will continue on the R402 for 600 m and then turn left onto the R401 the HGVs will continue travelling in a southerly direction for 3.7 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Kilsaran Quarry, Derryarkin/Derrycoffey Co. Offaly

HGVs will depart from Kilsaran Quarry in the townland of Derryarkin, Co. Offaly and turn right onto the R400 regional road. They will travel for 6.3 km before taking the second exit at the roundabout to continue on the R400. After travelling south on the R400 for 1.6 km the HGVs will turn left on to the R401. They will continue on the R401 for 9.4 km before taking the second exit on the roundabout to continue on the R401 for 400 m. The HGVs will then turn right and travel for 900 m before turning right onto the R402. They will continue on the R402 for 600 m and then turn left onto the R401 the HGVs will continue travelling in a southerly direction for 3.7 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Walshes Sandpit, Carbury, Co. Kildare

HGVs will depart from Walshes Sandpit in the townland of Carbury, Co. Kildare and turn left onto L1006. They will travel for 1.3 km before turning right onto the L1005. The HGVs will continue on the L1006 for 3.8 km before turning right onto the R402 for 400 m. They will then take the first exit at the roundabout to travel on the R403 for 5.9 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Hanlon Concrete, Robertstown, Co. Kildare

HGVs will depart from Hanlon Concrete in the townland of Robertstown, Co. Kildare and turn left onto Lowtown local road for 1.5 km. They will then turn right onto the R415. The HGVs will continue on the R415 for 1.8 km and then turn left onto the R403. They will travel on the R403 for 6.6 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Roadstone Quarry, Allen, Co. Kildare

HGVs will depart from Roadstone Quarry in the townland of Allen, Co. Kildare and turn right to continue for 1.2km on the L3002 before turning left onto the R415. They will continue for 2 km before turning left to stay on the R415. They will continue on the R415 for 5.4 km and then turn left onto the R403. They will travel on the R403 for 6.6 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Arkil Sand and Gravel, Rathangan, Co. Kildare

HGVs will depart from Arkil Sand and Gravel in the townland of Rathangan, Co. Kildare and turn left onto the L3002 local road. They will continue on the L3002 for 2.1 km and then continue onto the R401 for 1.7 km before bearing right over Rathangan Bridge. They will travel for 1.2 km and then take the third exit at the roundabout onto the L3001 where they will continue for 1.8 km to Site Entrance 2C and Site Entrance 3E where they will enter the Proposed Wind Farm.

Sheridans Quarry, Shean, Co. Offaly

HGVs will depart from Sheridans Quarry in the townland of Shean, Co. Offaly and turn right onto a local road for 700 m before turning left onto the R401. They will continue on the R401 for 1.1 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Kilsaran Concrete, Bunaterin, Tullamore, Co. Offaly

HGVs will depart from Kilsaran batching plant in the townland of Bunaterin, Co. Offaly and turn left onto the N52 before turning right onto the R420. They will turn left onto the R402 until they turn right onto the R401 until they reach Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Roadstone Concrete, Tullamore, Co. Offaly

HGVs will depart from Roadstones batching plant in the townland of Ballykilmurry, Co. Offaly and turn Right onto the R420 before turning left onto the R443 and then right onto the N52. They will turn left onto the R420 before turning left again onto the R402 until they turn right onto the R401 until they reach Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

3.4.3 Traffic Mitigation Measures During the Construction Phase

The successful completion of the Proposed Project will require significant coordination and planning and a comprehensive set of mitigation measures will be put in place before and during the construction stage of the Proposed Project in order to minimise the effects of the additional traffic generated by the Proposed Project. The range of measures will include the following which are also set out in Chapter 15 of the EIAR.

Traffic Management of Large Deliveries

Traffic management measures include the following:

- Identification of a delivery schedule;
- Details of the alterations required to the infrastructure identified in this report and any other minor alteration identified (hedgerows, etc.);
- A dry run of the route using vehicles with similar dimensions.

The transport of large components is challenging and can only be done following extensive route selection, route proofing and consultation with An Garda Síochána, the local authority and its road section and roads authorities. Turbine components are usually transported at night when traffic is lightest and this is done in consultation with the road authorities, An Garda Síochána Traffic Corp and special permits are generally required.

In some cases, minor accommodation works are required along a turbine delivery route such as hedge or tree cutting, temporary relocation of powerlines/poles, lampposts, signage, local road widening, and at one location, the provision of a temporary over-run areas over a roundabout centre island. Any upgrades to the public road network will be carried out in advance of turbine deliveries and following consultation and agreement with the relevant authorities. It is not anticipated that any sections of the local road network will be closed during the delivery of the abnormally sized loads.

Refer to Section 15.1.6.2.1 of Chapter 15 of the EIAR for the abnormal route assessment for the Proposed Turbine Delivery Route and Appendix 15-2 of the EIAR, for the Traffic Management Plan.

The following are the main points to note for these deliveries which will take place after peak evening traffic:

- The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised.
- The deliveries will be made in consultation with the Local Authority and An Garda Síochána.
- These nights will be spread out over an approximate period of 25 weeks and will be agreed in advance with the relevant authorities,
- In order to manage each of the travelling convoys, for each there will be two Garda escort vehicles that will stop traffic when required at the front and rear of the convoy of 3 vehicles.
- There will also be two escort vehicles provided by the haulage company for each convoy.

Traffic Management Plan

A detailed TMP, incorporating all the mitigation measures set out within this CEMP along with Chapter 15 of the EIAR, will be finalised and detailed provisions in respect of traffic management agreed with the local authority and An Garda Síochána prior to construction works commencing on site. The detailed TMP will include the following:

- **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Project, and this person will be the main point of contact for all matters relating to traffic management.
- **Delivery Programme** – a programme of deliveries will be submitted to Offaly County Council in advance of deliveries of turbine components to the Proposed Wind Farm. Liaison with the relevant local authorities, Transport Infrastructure Ireland (TII) and Motorways Maintenance and Renewals Contract (MmaRC), will be carried out

where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the Proposed Wind Farm.

- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. the delivery of turbine components at night via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number for the Traffic Management Co-Ordinator will also be provided.
- **A Pre and Post Construction Condition Survey** – Where required by the local authority, a pre-condition survey of roads associated with the Proposed Project will be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.
- **Liaison with the relevant local authorities** – Liaison with Offaly County Council and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads Section of Offaly County Council will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager.
- **Implementation of temporary alterations to road network at critical junctions** – at locations highlighted in Section 15.1.6.1 in Chapter 15 of the EIAR.
- **Identification of delivery routes –** The optimal delivery routes for general construction traffic have been identified as part of the detailed link capacity assessment set out in Section 15.1.6.1 and are adopted for the traffic impact assessment presented in this EIAR. Prior to construction these routes will be agreed with Kildare and Offaly County Councils and adhered to by all contractors.
- **Time restriction and locations** on routes - Construction traffic on the R402 through Edenderry will avoid the two peak hours between 08:00 – 09:00 and 17:00 – 18:00. Construction traffic on the R415 through Kilmeage will avoid the PM peak hour of 17:00 – 18:00. Grid construction on the R402 / R414 and L6002 should avoid school term time.
- **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at Access Junctions 5 on the R414 to facilitate the crossing of general construction traffic between Site Entrances I and J. All measures will be in accordance with the *"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"* (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S). Construction staff (flagman) will be present at this location during peak delivery times.
- **Implementation of Stop & Go traffic management, and/or implementation of temporary diversion routes (Precautionary Option) during the construction of the Proposed Grid Connection underground electrical cabling route –** As set out in Section 15.1.8 of this EIAR, in accordance with *"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"* (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S).
- **Consultation with residents/ business owners on Proposed Grid Connection underground electrical cabling route** – To ensure access maybe retained at all times.
- **Travel plan for construction workers –** While the assessment above has assumed the precautionary scenario in that construction workers will drive to the Project Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the Site and identification of area for parking on site.

- **Wheel washing / Road cleaning measures** – These additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network.
- **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

3.5 Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, peat, etc. and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the Proposed Construction Haul Routes.

In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Project Site's drainage system and will be pumped into a bowser or water spreader to dampen down Proposed Construction Haul Routes and temporary construction compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the Proposed Construction Haul Routes and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.

- A wheel wash facility will be installed at all proposed construction site entrances and will be used by vehicles before leaving the Project Site.
- Dust suppression measures, including water spraying of exposed surfaces and trafficked areas, will be implemented as required during dry weather conditions. In periods of extended dry weather, dust suppression will be necessary along Proposed Construction Haul Routes, site roads, grid route, road widening sections, substation, and construction compounds to ensure dust does not cause a nuisance.

- If necessary, such as during periods of dry weather, de-silted water will be taken from stilling ponds via the existing drainage system within the Allen Bog Group, which encompasses part of the Proposed Project, and will be pumped into a bowser or water spreader to dampen down internal access roads, turbine bases and site compounds to prevent the generation of dust where required.
- Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff as outlined in the CEMP.
  - Turbines components, construction materials and grid connection infrastructure will be transported to the Project Site via Proposed Construction Haul Routes, as agreed with the local authority.
- The Proposed Construction Haul Routes adjacent to the Project Site will be regularly inspected for cleanliness and cleaned as deemed necessary by the construction Site Supervisor/Site Manager.
  - Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
- The MRF facility will be local to the Project Site to reduce dust emissions associated with vehicle movements. The nearest licensed waste facility located are:
  - Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the nearest Proposed Turbine (T32).
  - Drehid Landfill, located approximately 6.5 km northeast of the nearest Proposed Turbine (T30).
  - Chem Regen, located approximately 25.5 km southwest of the nearest Proposed Turbine (T14).

- Cleary Compost & Shredding Ltd. located approximately 24.9 km south of the nearest Proposed Turbine (T14).
- Soltec (Ireland) Ltd, located approximately 31.5 km northwest of the nearest Proposed Turbine (T32).
- Allied Recycling, located approximately 9.2km south of the Proposed Offsite Substation.

- A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures.
- Temporary Construction Compounds are spread out throughout the Project Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further dust emissions.
- All HGVs transporting construction materials to and from the Project Site will be covered with suitably secured tarpaulin sheeting to prevent dust emission during transit along Proposed Construction Haul Routes.
- Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Project Site, particularly during extended dry periods
- If necessary, excavated material will be dampened prior to transport to the spoil management areas.
- The EnvCoW will perform daily visual site inspections of dust occurrence within the Project Site during construction, particularly during periods of dry weather and windy conditions. This will be noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site.

- The EnvCoW will have power to halt construction works if required.
  - The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m2/day (for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Project Site. Where dust levels are measured to be above this, mitigation measures will be reviewed.

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. Internal access roads will already be constructed before other road-going trucks begin to make regular or frequent deliveries to the Project Site (e.g., with steel or concrete). The internal access roads will comprise granular fill, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

However, in the interest of best practice, wheel wash facilities will be provided. Figure 4-55 of the EIAR includes typical details of a proposed self-contained wheel wash system for use during the construction phase of works. A wheel wash will be located at each of the construction and delivery entrances as shown on the site layout drawings included as Appendix 4-1 to Chapter 4 of the EIAR. The inclusion and final design associated with a wheel wash will be subject to agreement with the relevant local authority.

The contractor will be responsible for ensuring that all vehicles egressing the Project Site have used the wheel wash facilities. However, a road sweeper will be made available by the contractor for the cleaning of public roads in the event that they are dirtied by trucks associated with the Proposed Project.

3.6 Noise Control

The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the Project Site.

The following proposed measures to control noise will be implemented in full include:

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, Local Authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration; and
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations.

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'*.

Section 8 of BS5228-1:2009+A1:2014 further recommends a number of simple control measures as summarised below that will be employed onsite:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between weekdays 0700 – 1900hrs and Saturdays 0700 – 1400hrs. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours.

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.

3.7 Invasive Species Management

A baseline invasive species survey was carried out at the Project Site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011, as amended) the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) by a suitably qualified ecologist. As outlined in Chapter 6 of the EIAR, Japanese knotweed (*Reynoutria japonica*) was identified growing on the margins of an unnamed watercourse located along the southwestern boundary of Ticknevin Bog. During baseline aquatic surveys along the Proposed Grid Connection (see Aquatic Baseline Report, Appendix 6-3 for detail), the aquatic invasive plant species New Zealand pigmyweed (*Crassula helmsii*) was identified growing rarely at survey site D2 on the Grand Canal, at Shee Bridge, Co. Kildare.

In addition, the non-native invasive plant species cherry laurel (*Prunus laurocerasus*), butterfly bush (*Buddleja davidii*) montbretia (*Crocosmia* x *crocosmiiflora*) and wall cotoneaster (*Cotoneaster horizontalis*) were also each recorded once within the Project Site, in Killina, Glashabaun North, Barnaran and Lodge Bogs, respectively. These species are not listed under the Third or First Schedules and were not recorded within or adjacent to the Proposed Project infrastructure footprint.

3.7.1 Site Management

Careful preparation and planning of the works are crucial to successful treatment of invasive species. The following list of guidelines detailed above in Section 3.7, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas. Should any risk of contaminated material escaping be observed by the Site Supervisor, the management plan for the Project Site must be amended by an appropriately qualified person to mitigate against the risk.

3.7.2 Establish Good Site Hygiene

The following best practice biosecurity measures will be in place during construction of the Proposed Project to avoid the introduction of invasive species to the Project Site:

- Good construction site hygiene will be employed to prevent introduction of problematic invasive alien plant species (e.g., Japanese knotweed, Rhododendron, Giant Rhubarb, etc.) to the Project Site by thoroughly washing vehicles at designated off-site wheel-wash facilities prior to entering the Project Site.
- Any soil and topsoil required on the Project Site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- A pre-commencement invasive species survey of the construction footprint will be undertaken by a qualified ecologist to determine if any invasive species have established on the Project Site since the undertaking of the previous surveys. The treatment and control of invasive alien species if recorded will follow guidelines issued by the National Roads Authority – The Management of The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020).

3.8 Resource and Waste Management Plan

This section of the CEMP provides a resource and waste management plan (RWMP) which outlines the best practice procedures during the excavation and construction phases of the project. The RWMP will outline the methods of waste prevention and minimisation by recycling, recovery, and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort.

3.8.1 Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the Project Site to ensure that all contractors hired to remove waste from the Project Site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and

subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The RWMP has been produced in line with the following guidance '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' (EPA, 2021)[6].

3.8.2 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing waste in the following order:

Prevention and Minimisation:

The primary aim of the RWMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project.

Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill.

Recycling of Waste:

There are a number of established markets available for the beneficial use of construction waste such as using waste concrete as fill for new roads.

At all times during the implementation of the RWMP, disposal of waste to landfill will be considered only as a last resort.

3.8.3 Construction Phase Waste Management

3.8.3.1 Description of the Works

The construction of the Proposed Project will involve the construction of:

- Proposed Wind Farm: this refers to Proposed Turbines and associated foundations and hard-standing areas, meteorological mast, access roads, temporary construction compounds, peat and spoil areas, site drainage, amenity, Proposed Turbine Delivery Route and associated accommodation works, and all ancillary works and apparatus. The Proposed Wind Farm is described in detail in Chapter 4 of the EIAR.
- Proposed Grid Connection: this refers to the Proposed Onsite Substation, Proposed Offsite Substation, Proposed Grid Connection underground electrical cabling, wind farm control building, associated temporary construction compound, 2 no. gantry structures, 2 no. crane pad, 2 no. tower pad, 4 no. steel masts, temporary access track, and overhead line (OHL) connecting to the existing Maynooth-Dunstown 220kV OHL, and all ancillary works and apparatus. The Proposed Grid Connection is described in detail in Chapter 4 of the EIAR.

[6] *EPA, 2021. Best practice guidelines for the preparation of resource & waste management plans for construction and demolition projects. Available at: https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf*

The Proposed Turbines, 1 no. relay mast, and 2 no. meteorological masts will be manufactured off-site and delivered to the Project Site where on site erection will occur.

The Proposed Turbines, 1 no. relay mast, and 2 no. meteorological masts foundations will consist of stone from the licensed quarries and a concrete base which will contain reinforcing steel. These concrete foundations will be shuttered with steel formwork specifically designed for the works and re-usable off site on similar projects.

The new site roads and existing roads for upgrade will be constructed with rock sourced predominantly from local quarries.

The Proposed Onsite Substation, Proposed Offsite Substation and control buildings will be constructed on a concrete foundation with the buildings constructed with concrete masonry blocks with a timber roof structure and roof tile or slate covering. The roof structure will be made up of prefabricated roof trusses manufactured off site to minimise timber cutting on site. The construction of the underground electrical cabling will consist of excavating sections of a trench, laying the ducting and cabling and backfilling.

The waste types arising from the construction phase of the Proposed Project are outlined in Table 3-2 below.

Table 3-2 Expected waste types arising during the Construction Phase

Material Type	Example	EWC Code
Cables	Electrical wiring	17 04 11
Cardboard	Boxes, cartons	15 01 01
Composite packaging	Containers	15 01 05
Metals	Copper, aluminium, lead, iron and steel	17 04 07
Inert materials	Sand, stones, plaster, rock, blocks	17 01 07
Mixed municipal waste	Daily canteen waste from construction workers, miscellaneous	20 03 01
Plastic	PVC frames, electrical fittings	17 02 03
Plastic packaging	Packaging with new materials	15 01 02
Tiles and ceramics	Slates and tiles	17 01 03
Wooden packaging	Boxes, pallets	15 01 03
Tarmac/Bitumen	Road surfacing along internal underground cabling at the L7002	17 03 02

Hazardous wastes that may occur on site during the construction phase of the Proposed Project may include oil, diesel fuel, chemicals, paints, preservatives etc. All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. As mentioned above, hazardous wastes will be kept separate from non-hazardous wastes so that contamination does not occur.

3.8.3.2 Waste Arising and Proposals for Minimisation, Refuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from excavation and unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures will be taken to ensure excess waste is not generated during construction, including:

- Ordering of materials will be on an 'as needed' basis to prevent over supply to site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock;
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site;
- Request that suppliers use least amount of packaging possible on materials delivered to the Project Site;
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal;
- Ensuring correct sequencing of operations;
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.8.3.3 Waste Arising from Construction Activities

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein.

The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the Proposed Wind Farm site. Therefore, all wastes streams generated on site will be deposited into waste skips located throughout the Project Site. This waste material will be transferred to a MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.

The waste generated from the Proposed Turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be deposited into the on-site skips and subsequently transferred to the MRF.

It is not envisaged that there will be any waste material arising from the materials used to construct the proposed internal site access roads as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis.

Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skips. It will also be made clear that the burning of waste material on site is forbidden.

3.8.3.4 Waste Arising from Decommissioning

The design life of the proposed renewable energy development is 35 years after which time a decision will be made to determine whether or not the turbines will be replaced by new turbines or if decommissioning will occur. The lengthy time frame between the completion of the construction phase and decommissioning will result in the only materials remaining on site at that time will be infrastructural material such as the turbine foundations, turbines and the granular material used to

construct roads. When the Proposed Wind Farm is decommissioned, cranes will disassemble each turbine tower and all equipment. The associated components will be removed from site for re-use, recycling or waste disposal. Any structural elements that are not suitable for recycling will be disposed of in an appropriate manner. All lubrication fluids will be drained down and put aside for appropriate collection, storage, transport and disposal. Any materials which cannot be re-used or recycled will be disposed of by an appropriately licenced contractor.

The waste types arising from the decommissioning of the Proposed Project are outlined in Table 3-3 below.

Table 3-3 Expected Waste types arising during the Decommissioning Phase

Material Type	Example	EWC Code
Cables	Electrical wiring	17 04 11
Metals	Copper, aluminium, lead, iron and rebar	17 04 07
Inert materials	Crushed stone, concrete	17 01 07
Lubricating Oils/Fluids	Oils used within wind turbines	13 02 04

3.8.3.5 Reuse

Many construction materials can be reused a number of times before they must be disposed of:

- Concrete can be reused as aggregate for roads cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.8.3.6 Recycling

If a certain type of construction material cannot be reused onsite, then recycling is the most suitable option. The opportunity for recycling on site will be restricted to the associated packaging from the wind turbines.

All waste that is produced during the construction phase including dry recyclables will be deposited in multiple on-site skips initially and sent for subsequent segregation at a remote facility. The anticipated volume of all waste material to be generated at the development is low which provides the justification for adopting this method of waste management.

3.8.3.7 Implementation

3.8.3.7.1 *Roles and Responsibilities for Waste Management*

Prior to the commencement of the development a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.

3.8.3.7.2 *Training*

It is important for the Construction Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the RWMP. All employees working on site during the construction phase of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.8.3.7.3 *Record Keeping*

The RWMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The RWMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the Project Site will be required to provide documented records for all waste dispatches leaving the Project Site. Each record will contain the following:

- Consignment Reference Number Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Site Address of Destination Facility

3.8.3.8 Resource and Waste Management Plan Conclusion

The RWMP will be properly adhered to by all staff involved in the Proposed Project which will be outlined within the induction process for all site personnel. The waste hierarchy will always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary RWMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed RWMP to be completed after the planning phase of the Proposed Project.

4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

4.1 Roles and Responsibilities

The Project Developer will appoint a design team to prepare the detailed design for the Proposed Project prior to the commencement of construction and ensure all planning and environmental obligations are met. The developer will appoint a Project Contractor who will be responsible for the construction of the Proposed Project in accordance with this CEMP which will be updated by the contractor as required during the construction phase of the Proposed Project. Any updated CEMP must meet or exceed the standards and requirements set out in this document.

The EnvCoW will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. The EnvCoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the EnvCoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Project Contractor, having been nominated by the developer to fulfil the role.

The EnvCoW will have the power to halt the works, should the need arise and will be supported by the developer to ensure the contractor adheres to such an instruction.

The EnvCoW will also have to call upon the Project Ecologist, Project Hydrologist, Project Archaeologist or other members of the Project Developer's design team, as required, to oversee the contractor's works on-site. An organogram structure for the construction stage roles is as outlined below.

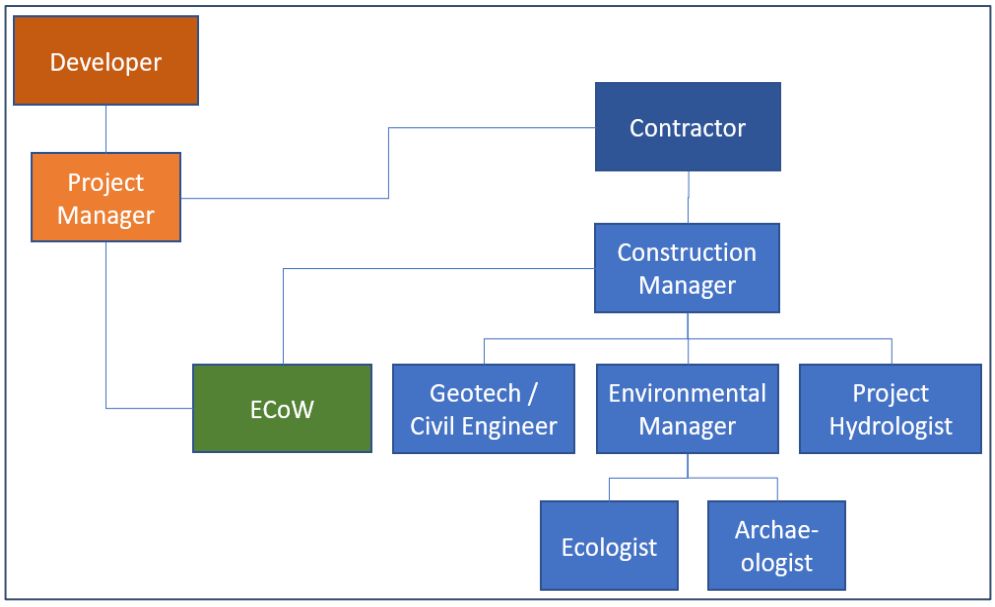


Figure 4-1 Proposed Project Organogram

Any requirement of the granted permission, for the works to be supervised by an engineer with professional indemnity insurance, who upon completion of the works, shall certify the said works, will be adhered to. Such an engineer will be appointed to oversee and supervise the construction phase of the Proposed Project.

4.1.1 Construction Manager

The Project Contractor will be required to nominate a Construction Manager who will have responsibility for the organisation and execution of environmental requirements outlined in this CEMP or any further versions thereof. The Construction Manager will have an assigned deputy who will fulfil the role of Environmental Manager. To implement the CEMP, the Construction Manager with the assistance of the Environmental Manager will be required to:

- Implement all Proposed Project design requirements to minimise environmental risk;
- Implement all CEMP requirements and measures to minimise environmental risk;
- Ensure any site personnel responsible for directing works on site are familiar with all requirements of the CEMP;
- Propose revisions to the Proposed Project's CEMP for approval of the Project Developer, project design team and ECoW, only where any such revisions meet or exceed the standards and requirements set out in this document;
- Ensure that all environmental standards are achieved during the construction phase of the Proposed Project;
- Promptly implement any remedial action required to rectify and close-out any non-compliant items identified by the ECoW;
- Ensure immediate notification of environmental incidents are issued to the ECoW, the Project Developer and the relevant authorities, initially by phone and as soon as is practicable by e-mail;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers.
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.1.2 Site Environmental Clerk of Works

The Project Developer will be required to engage an independent and suitably qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of EnvCoW to oversee the construction works and audit the implementation of the CEMP. The EnvCoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. The responsibilities and duties of the EnvCoW will include the following:

- Review/approval of the CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake environmental monitoring, inspections and reviews to ensure the works are carried out in compliance with the CEMP by the Project Contractor;
- Manage the water quality monitoring programme and turbidity monitors;
- Maintain a live Actions List and accompanying map outlining any corrective actions across the Project Site requiring attention or action by the contractor;
- Confirm for the Project Contractor that pre-commencement requirements have been met to allow construction activities to commence;
- Highlight for the contractor, any abandonment triggers that are occurring and inform the contractor that works are to cease;
- Generate environmental reports as required to show environmental data trends and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
    - Prevention of environmental pollution and improvement to existing working methods;
    - Changes in legislation and legal requirements affecting the environment;
    - Suitability and use of plant, equipment and materials to prevent pollution;
    - Environmentally sound methods of working and systems to identify environmental hazards;

- Assist the contractor in coordinating the required inputs and site visits from the Project Ecologist or Project Hydrologist to support the EnvCoW role;
- Ensure immediate notification of any environmental incidents are issued to the Construction Manager and Project Developer;
- Support the investigation of incidents of significant, potential or actual environmental damage and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties.
- Liaise with the Project Design Team and attend meetings to report on audit findings
- Support the contractor who will be responsible for providing toolbox talks and site induction content to ensure the requirements of the CEMP are delivered on site.
- The geotechnical design requirements of the Proposed Project are not within the remit of the EnvCoW.

The level, detail and frequency of reporting expected from the EnvCoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.

4.1.3 Project Ecologist/Ornithologist

The Project Ecologist will be available to support the EnvCoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the Proposed Project. The Project Ecologist will not be on site full time but will undertake pre-commencement surveys and visit the Project Site as required. The responsibilities and duties of the Project Ecologist/Ornithologist will include the following:

- Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided.
- Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Project Site.
- Oversee management of ornithological and ecological issues during the construction period and advise on ornithological and ecological issues as they arise.
- Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
- Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.

4.1.4 Project Hydrologist

The Project Hydrologist is part of the design team that will prepare the detailed drainage design for the construction phase of the Proposed Project, but will also support the EnvCoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design by the Project Contractor. The Project Hydrologist will not be on site full time but will be required to visit as necessary to oversee the implementation of their drainage design.

The responsibilities and duties of the Project Hydrologist will include the following:

- Preparation of detailed drainage design before construction commences;
- Input to the CEMP in respect of drainage design and water quality management;
- Attend site to support EnvCoW and oversee and audit the effective implementation of the detailed drainage design;
- Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control in support of the EnvCoW in monitoring the effectiveness of the drainage design as it is implemented on-site.

4.1.5 Project Archaeologist

The Project Archaeologist will report to the Environmental Manager/ EnvCoW and is responsible for archaeological monitoring of the Project Site during the construction phase. This will include monitoring of site investigations and excavation works as well as the monitoring and metal detection of spoil during construction.

If new archaeological material is detected during the pre-construction re-inspection, testing or monitoring, the project archaeologist will be responsible for ensuring they are preserved by record (archaeologically excavated) and therefore permanently removed with a full record made.

The responsibilities and duties of the Project Archaeologist will include the following:

- Confirm designated buffers surrounding sensitive archaeological features to be implemented and maintained within the Proposed Wind Farm site throughout construction.
- Inform and educate on-site personnel of the archaeological sensitivities within the Project Site.
- Oversee management of archaeological issues during the construction period and advise on archaeological issues as they arise.
- Attend site to support EnvCoW and oversee and audit the effective implementation of construction of new road over archaeological feature;
- Ongoing inspection and monitoring of the Proposed Project and ensure construction is carried out as specified in the EIAR and in relevant planning conditions.

4.1.6 Project Geotechnical Engineer/Civil Engineer

The Geotechnical Engineer will report to the Construction Manager and is responsible for inspection and review of geotechnical aspects associated with construction of the Proposed Project. The Geotechnical Engineer will not be on site full time but will visit site at least once a month during the construction phase civil works and on a weekly basis during site preparation/groundworks.

The responsibilities and duties of the Geotechnical Engineer will include the following:

- Visit site regularly, or at least once a month during the construction phase, to complete geotechnical audits and reviews and report any issues to the Construction Manager;
- Ensuring that identified hazards are listed in the Geotechnical Risk Register and that these are subject to ongoing monitoring; and,
- Ongoing inspection and monitoring of the Proposed Project, particularly in temporary stockpile areas, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, NIS and in relevant planning conditions.

4.2 Water Quality and Monitoring

4.2.1 Pre-Construction Baseline Monitoring

Water quality field testing and laboratory analysis will be undertaken prior to commencement of clear-felled forestry, vegetation removal and construction at the Project Site. The monitoring programme will be subject to agreement with Offaly and Kildare County Council but will be based on the planning stage programme already outlined in the EIAR and Surface Water Management Plan (SWMP) (Appendix 4-6) and presented in this CEMP. Analysis will be for a range of parameters with relevant

regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-16 of the EIAR.

Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low-flow and high-flow stream conditions. The high-flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell.

A network of existing bog drains already exist, and these will be integrated and enhanced as required and used within the Proposed Project drainage system. These existing drains will continue to function as it is during the pre-construction phase.

However, prior to commencement of works in sub-catchments across the Proposed Wind Farm site, drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. These inspections will be done on a catchment-by-catchment basis as the construction works develop across the Proposed Wind Farm site, as works in all areas will not commence simultaneously.

The methodology for water quality monitoring before, during and after the construction phase of the Proposed Project is outlined in detail in Section 4 of the SWMP which is included as Appendix 4-6 of the EIAR.

This document includes details in relation to baseline monitoring, daily visual inspections, continuous monitoring, monthly laboratory analysis, field monitoring and reporting.

4.2.2 Construction Phase Monitoring

4.2.2.1 Daily Visual Inspections

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of commencement of any works. Daily visual inspections of drains and outfalls will also be performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. Should the suspended solids levels measured during construction be higher than the existing levels, the source will be identified, and additional mitigation measures implemented. Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

During the construction phase field testing (visual, supplemented with pH, electrical conductivity, temperature, dissolved oxygen and turbidity monitoring), sampling and laboratory analysis of a range of parameters[7] with relevant regulatory limits and EQSs will be undertaken for each primary watercourse interaction with the Proposed Project, and specifically following heavy rainfall events (i.e. weekly, monthly and event-based).

Inspection sheets and photographic records will be kept on site. Inspection points will include the in-situ field monitoring point locations and the laboratory analysis sampling points. Inspection points will depend on works being completed within the catchment upstream of the identified monitoring locations. Visual inspections will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period and data including photographs will be collected by visual inspections and independently assessed by the Project Hydrologist who will monitor and advise on the records being received.

[7] *example suite: pH (field measured), Electrical Conductivity (field measured), temperature (field measured), Dissolved Oxygen (field measured), Turbidity (NTU) (sonde measured), Flow (m/s), Total Suspended Solids (mg/l), Ammonia, Nitrite (NO_2) (mg/l), Ortho-Phosphate (P) (mg/l), Nitrate (NO_3) (mg/l), Phosphorus (unfiltered) (mg/l), Chloride (mg/l), and BOD (mg/l).*

The following periodic inspection regime will be implemented:

- Daily general visual inspections of site operations and inspections of all drainage infrastructure within the Project Site and in the surrounding area by the EnvCoW or a suitably qualified and competent person as delegated by the EnvCoW;
- Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement;
- Event based inspections by the EnvCoW as follows:
    - >10 mm/hr (i.e. high intensity localised rainfall event);
    - >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
    - Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week).
- Monthly site inspections by the Project Hydrologist/ EnvCoW during construction phase;
- Quarterly site inspections by the Project Hydrologist/ EnvCoW after construction for a period of one year following the construction phase; and,
- A written record will be maintained or available on-site within this CEMP which will be maintained on-site during the construction phase.

4.2.2.2 Continuous Turbidity Monitoring

Turbidity monitors or sondes can be installed where required at locations surrounding the Project Site. The sondes will provide continuous readings for turbidity levels in the watercourse. This equipment will be supplemented by daily visual monitoring at their locations as outlined in the sections below.

4.2.2.3 Monthly Laboratory Analysis

Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken as per water monitoring programme for the Proposed Project. This will not be restricted to just these locations around the Proposed Project site with further sampling points added as deemed necessary by the EnvCoW in consultation with the Project Hydrologist and Site Manager.

4.2.2.4 Field Monitoring

Field chemistry measurements of unstable parameters, (pH, conductivity, temperature) will be taken at the surface water monitoring locations, as per monthly surface water monitoring programme for the Proposed Project. The EnvCoW or the Project Hydrologist will undertake monthly surface water monitoring programme (which includes baseline pre-construction monitoring, construction phase monitoring and post-construction monitoring). In-situ field monitoring will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.

4.2.2.5 Monitoring Parameters

The analytical determinants of the monitoring programme (including limits of detection and frequency of analysis) will be as per S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations and European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. The likely suite of determinants will include:

- pH (field measured)
- Electrical Conductivity (field measured)
- Temperature (field measured)

- Dissolved Oxygen (field measured)
- Alkalinity (pH measured)
- Total Phosphorus
- Chloride
- Nitrate
- Nitrite
- Total Nitrogen
- Ortho-Phosphate
- Total Ammonia N
- Biochemical Oxygen Demand
- Total Suspended Solids
- True Colour
- Dissolved organic carbon

4.2.3 Construction Phase Drainage Inspections and Maintenance

Drainage performance will form part of the civil works contract requirements. During the construction phase, the Project Contractor will be responsible for the effectiveness of drainage measures. This responsibility extends to drainage maintenance, to ensure that the installed drainage measures continue to perform as intended by the detailed drainage design. Silt fences, check dams, level spreaders and other drainage measures likely to form part of the detailed drainage design, require regular maintenance to ensure they continue to function effectively, and the Project Contractor is entirely responsible for this maintenance.

Regular inspections of all existing and installed drainage measures should be undertaken by the Project Contractor, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system. The contractor will devise a system of recording the findings of these inspections. Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. For this reason, the drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance.

The EnvCoW will monitor the effectiveness of the on-site drainage during changing weather, ground or drainage conditions encountered on site, through their regular visual inspections of on-site watercourses and water monitoring programme. Where it appears that additional drainage measures will be required to ensure the drainage system remains effective, the EnvCoW will notify the contractor, the developer and project design team including the Project Hydrologist. The EnvCoW's role in this regard does not replace the need for the weekly (at least) inspections of the drainage system's measures by the Project Contractor.

4.2.4 Surface Water Monitoring Reporting

Visual inspection and laboratory analysis results of monthly surface water quality monitoring shall assist in determining requirements for any necessary improvements in drainage controls and pollution prevention measures implemented on site.

It will be the responsibility of the EnvCoW to present the ongoing results of water quality and weather monitoring at or in advance of regular site meetings.

Reports on water quality will consider all field monitoring and visual inspections, and results of laboratory analysis completed for that period. Reports will describe how the results compare with baseline data as well as previous reports on water quality. The reports will also describe whether any

deterioration or improvement in water quality has been observed, whether any effects are attributable to construction activities and what remedial measures, or corrective actions have been implemented. Any proposed alteration to sampling frequency will be agreed with the relevant Planning Authority in advance.

4.3 Environmental Awareness and Training

4.3.1 Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed on-site depending on their assigned roles and responsibilities on site.

Where necessary, the Environmental Induction will as a minimum include:

- A copy of the Environmental Management Site Plans and discussion of the key environmental risks and constraints;
- An outline of the CEMP structure;
- A discussion of the applicable Works Method Statement;
- The roles and responsibilities of staff, including contractors, in relation to environmental management; and,
- An outline of the environmental Incident Management Procedure.

4.3.2 Toolbox Talks

Toolbox talks will be held by the EnvCoW or Construction Manager at the commencement of each day, or at the commencement of new activities. The aims of the toolbox talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities. The toolbox talks will include training and awareness on topics including:

- On-site Archaeological and Ecological Sensitivities;
- Buffers to be upheld – provided by the Project Hydrologist, Project Archaeologist, and Project Ecologist/Ornithologist;
- Sediment and Erosion Control;
- Good site practice;
- Planned/ongoing Works;
- Keeping to tracks – vehicle rules;
- Strictly adhering to the development footprint;
- Fuel Storage;
- Materials and waste procedures.

Site meetings would be held on a regular basis involving all site personnel. The objectives of site meetings are to discuss the coming weeks activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same noncompliance reoccurring.

During construction of the Proposed Project, all staff will be made aware of and adhere to the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (Updated 2017)'*. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.

5. HEALTH AND SAFETY

Construction of the Proposed Project will necessitate the presence of a construction site and travel on the local public road network to and from the Project Site. Construction sites and the machinery used on them pose a potential health and safety hazard to construction workers if site rules are not properly implemented. The Proposed Project will be constructed in accordance with all relevant Health and Safety Legislation, including:

- Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005);
- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016);
- S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and
- Part 4 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007).

The following measures below are also detailed in Chapter 19: Schedule of Mitigation and Monitoring Measures of the EIAR.

- A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage.
- All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. SafePass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting site access during construction. Fencing will be erected in areas of the Project Site where uncontrolled access is not permitted.
- Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Project.
- The suitability of machinery and equipment for use near power lines will be risk assessed.
- All staff will be trained on operating voltages of overhead electricity lines running over the Project Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to the Project Site.
- Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire.
- When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. OHL proximity detection equipment will be fitted to machinery when such works are required.
- Information on safe clearances will be provided to all staff and visitors.
- Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site.

- All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan.

The scale and scope of the project necessitates that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (Updated 2017)'*. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the Proposed Project;
- Where possible, eliminate the hazards or reduce the risks;
- Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan;
- Ensure that the work of designers is coordinated to ensure safety;
- Organise co-operation between designers;
- Prepare a written Safety and Health Plan;
- Prepare a safety file for the completed structure and give it to the Applicant; and
- Notify the Authority and the client of non-compliance with any written directions issued.

The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):

- Development of the Safety and Health Plan for the construction stage with updating where required as work progresses;
- Compile and develop safety file information.
- Reporting of accidents / incidents;
- Weekly site meeting with PSCS;
- Coordinate arrangements for checking the implementation of safe working procedures.
- Ensure that the following are being carried out:
    - Induction of all site staff including any new staff enlisted for the project from time to time;
    - Toolbox talks as necessary;
    - Maintenance of a file which lists personnel on site, their name, nationality, current SafePass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date;
- Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance;
- Monitor the compliance of contractors and others and take corrective action where necessary; and
- Notify the Authority and the client of non-compliance with any written directions issued.

6. EMERGENCY RESPONSE PLAN

6.1 Overview

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency. The Project Site ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor/PSCS and suppliers as the project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor's ERP within this within this document.

This is a working document that requires updating throughout the various stages of the Proposed Project.

6.1.1 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Supervisor/Construction Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 6-1. In a situation where the Site Supervisor/ Construction Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command outlined in Figure 6-1. This will be updated throughout the various stages of the Proposed Project.

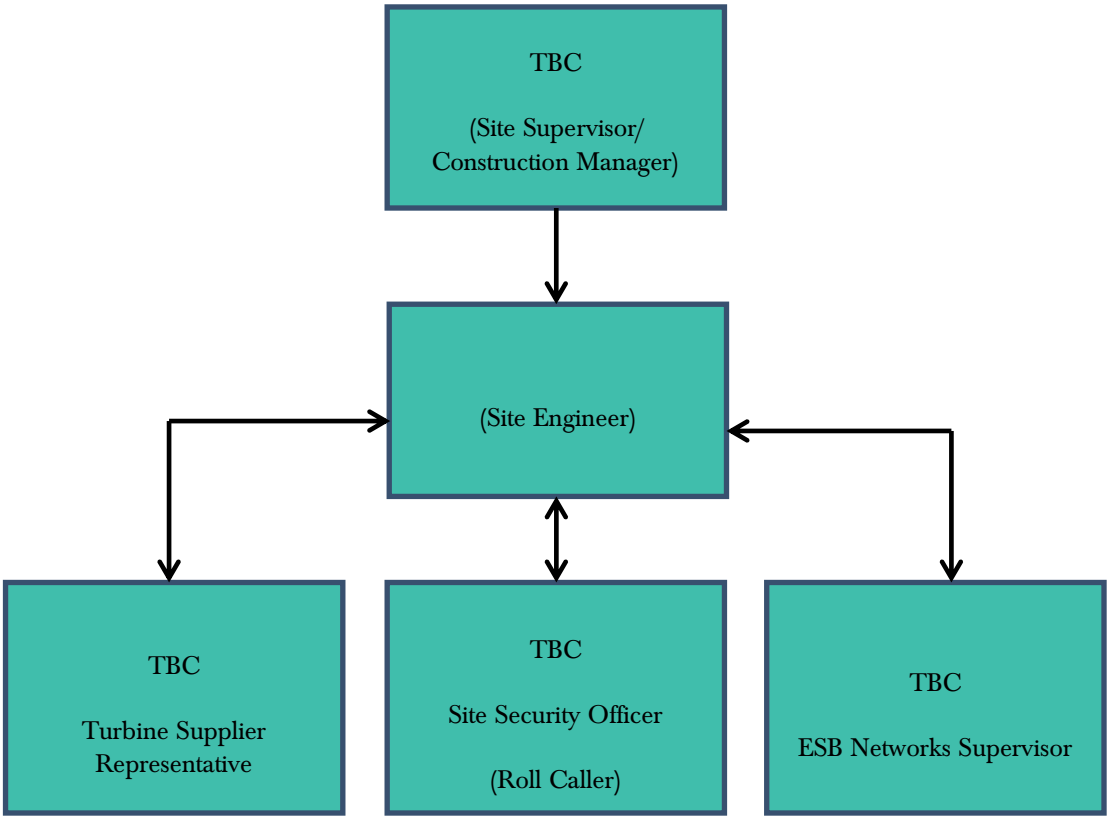


Figure 6-1 Emergency Response Procedure Chain of Command

6.1.2 Hazard Identification

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require an emergency response in the event of an occurrence.

Table 6-1 Hazards associated with potential emergency situations

Hazard	Emergency Situation
Construction Vehicles: Dump trucks, tractors, excavators, cranes etc.	Collision or overturn which has resulted in operator or third-party injury.
Abrasive wheels/Portable Tools	Entanglement, amputation or electrical shock associated with portable tools.
Contact with services	Electrical shock or gas leak associated with an accidental breach of underground services.
Fire	Injury to operative through exposure to fire.
Falls from heights including falls from scaffold towers, scissor lifts, ladders, roofs and turbines.	Injury to operative after a fall from a height.
Sickness	Illness unrelated to site activities of an operative e.g., heart attack, loss of consciousness, seizure.
Turbine Specific Incident	This will be included when the upon agreement and section of the final turbine type.
Siltation of watercourses, Fuel Management and Spill Control	Run-off to watercourses casing pollution.

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 6-1 the Site Supervisor/Construction Manager will carry out the following:

1. *Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.*
2. *Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the Project Site. The Site Supervisor/Construction Manager must proceed to the assembly point if the emergency poses any significant threat to their welfare and if there are no injured personnel at the scene that require assistance. The Site Supervisor/Construction Manager will be required to use their own discretion at that point. In the case of fire, the emergency evacuation of the Project Site should proceed, without exception. The site evacuation procedure is outlined in Section 6.1.3.*
3. *Make safe the area if possible and ensure that there is no identifiable risk exists with regard to dealing with the situation e.g., if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.*
4. *Contact the required emergency services or delegate the task to someone. If delegating the task, ensure that the procedures for contacting the emergency services as set out in Section 6.3 is followed.*
5. *Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g., cordon off an area where an incident associated with electrical issues has occurred.*

6. *Contact any regulatory body or service provider as required, e.g., ESB Networks, the numbers for which are provided in Section 6.3.*
7. *Contact the next of kin of any injured personnel where appropriate.*

6.1.3 Site Evacuation/Fire Drill

A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:

1. *Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation.*
2. *An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.*
3. *A roll call will be carried out by the Site Security Officer to account for all personnel on site.*
4. *The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide the next course of action, which be determined by the situation that exists at that time and will advise all personnel accordingly.*

All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

6.1.4 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction phase of the Proposed Project. Oil/fuel spillages are one of the main environmental risks that will exist on the Project Site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. Spill kits will be available at all times; no fuel or chemicals stored on the bog and refuelling to take place away from the raised bog area in a designated refuelling area.

The mitigation measures that will be taken to avoid accidental leaks or spills of hydrocarbons are outlined in Section 3.2.8 above. In the case of an incident, the following procedure will be followed:

1. *Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.*
2. *If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.*
3. *Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.*
4. *If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.*
5. *If possible, clean up as much as possible using the spill control materials.*
6. *Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.*
7. *Notify the EnvCoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.*
8. *The EnvCoW will inspect the Project Site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.*
9. *The Construction Manager will notify the appropriate regulatory body such as Offaly County Council, Inland Fisheries Ireland (IFI), National Parks and Wildlife Service (NPWS), etc. if deemed necessary.*

The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

1. *The EnvCoW must be immediately notified.*
2. *If necessary, the Construction Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.*
3. *The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.*
4. *If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site (pSPA or cSAC), the EnvCoW will liaise with the Project Ecologist.*
5. *If the incident has impacted on a sensitive receptor such as an archaeological feature the EnvCoW will liaise with the Project Archaeologist.*

A record of all environmental incidents will be kept on file by the EnvCoW and the Project Contractor. These records will be made available to the relevant authorities such as Offaly County Council, Kildare County Council, IFI, NPWS, etc. if required. The EnvCoW will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

6.2 Contacting the Emergency Services

6.2.1 Emergency Communications Procedure

In the event of requiring the assistance of the emergency services the following steps will be taken:

- **Stay calm.** It is important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.
- **Know the location of the emergency and the number you are calling from.** This may be asked and answered a couple of times but do not get frustrated. Even though many emergency call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.
- **Wait for the call-taker to ask questions, then answer clearly and calmly.** If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.
- **If you reach a recording, listen to what it says.** If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.
- **Let the call-taker guide the conversation.** He or she is typing the information into a computer and may seem to be taking forever. There is a good chance, however, that emergency services are already being sent while you are still on the line.
- **Follow all directions.** In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you do not understand.
- **Keep your eyes open.** You may be asked to describe victims, suspects, vehicles, or other parts of the scene.
- **Do not hang up the call** until directed to do so by the call taker.

In the event of an emergency, it may be necessary to liaise with the emergency services to assist them in locating the Project Site if required. This may involve directing them to a designated meeting point that can be easily identified or accessed. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.

6.3 Contact Details

A list of emergency contacts is presented in Table 6-2. 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 6-2 Emergency Contacts

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardaí	999/112
Local Doctor – Edenderry (St Conleth's Road, Edenderry, Co. Offaly, R45 EF83)	046 973 1941
Hospital – Naas General Hospital, Naas	045 849 500
ESB Emergency Services	1850 372 999
Gas Networks Ireland Emergency	1800 20 50 50
Garda Síochána – Edenderry Garda Station	046 973 1290
Health and Safety Co-ordinator - Health & Safety Services	TBC
Health and Safety Authority	1890 289 389
Inland Fisheries Ireland (IFI)	1890 347 424
Project Supervisor Construction Stage (PSCS): TBC	TBC
Project Supervisor Design Stage (PSDS): TBC	TBC
Client: BnM	TBC

6.4 Procedure for Personnel Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming in an emergency situation where serious injury has occurred and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

6.5 Induction Checklist

Table 6-3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the Project Site. This will be updated throughout the various stages of the Proposed Project.

Table 6-3 Emergency Response Plan Items Applicable to the Site Induction Process

ERP Items to be included in Site Induction	Status
All personnel will be made aware of the evacuation procedure during site induction	
It may be necessary to liaise with and assist the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.	
All operatives on site without any exception will have undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.	

7. MITIGATION PROPOSALS

All mitigation measures relating to the pre-commencement and construction phases of the Proposed Project are set out in the various sections of the EIAR, NIS prepared as part of the planning application to ACP.

This section of the CEMP groups together all of the mitigation measures presented in the above documents. The Mitigation Measures are presented in the following pages and are also outlined within Chapter 19: Schedule of Mitigation and Monitoring Measures. Operational and Decommissioning Phase mitigation measures are not included in the table below, however, can be viewed in Chapter 19 of the EIAR and Appendix 4-7 (Decommissioning Plan).

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the Proposed Project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 7-1 Proposed Mitigation Measures

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Environmental Management	EIAR Chapter 4	› All proposed activities on the Project Site will be provided for in an environmental management plan. A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Project and is included in Appendix 4-4 of this EIAR. › The CEMP includes details of drainage, peat and spoil management, and resource and waste management, and clearly outlines the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR. In the event that planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned, and will be submitted to the Planning Authority for approval.		
MM2	Environmental Management	Appendix 4-4: CEMP Section 4	› The Project Developer will be required to engage an independently and suitably qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (EnvCoW) to oversee the construction works and audit the implementation of the CEMP. › The EnvCoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. › The EnvCoW will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. › The EnvCoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer.		

			› For the sake of expediency, the EnvCoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Proposed Contractor, having been nominated by the developer to fulfil the role. › The level, detail and frequency of reporting expected from the EnvCoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.		
MM3	Surface Water Quality	Appendix 4-6 EIAR Chapter 9	› Water quality field testing and laboratory analysis will be undertaken prior to commencement of clear-felled forestry, vegetation removal and construction at the Project Site. The monitoring programme will be subject to agreement with Offaly and Kildare County Council but will be based on the planning stage programme already outlined in the EIAR and CEMP and presented in this document. › Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 4-1 in the Surface Water Management Plan (Appendix 4-6). › Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low-flow and high-flow stream conditions. The high-flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell. › A network of existing bog drains already exist, and these will be integrated and enhanced as required and used within the Proposed Project drainage system. These existing drains will continue to function as it is during the pre-construction phase. › However, prior to commencement of works in sub-catchments across the Proposed Wind Farm site, drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. These inspections will be done on a catchment-by-catchment basis as the construction works develop across the Proposed Wind Farm site, as works in all areas will not commence simultaneously.		

MM4	Site Drainage Plan	EIAR Chapter 4 Appendix 4-4 Appendix 4-5 Appendix 4-6	› The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the site to set out and assist with micro-siting of proposed drainage controls as outlined in Section 4.7 in Chapter 4 of the EIAR. › Prior to commencement of construction works in sub-catchments across the Project Site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the Project Site, as works in all areas will not commence simultaneously. › The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses where possible. Within the Proposed Wind Farm site, there are a total of 15 no. watercourse crossing locations over natural watercourses (rivers and streams). There are 2 no. crossing locations over the Figile River that will have existing infrastructure removed and will be upgraded with a clear span bridge. › There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flow using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e., 50m. Buffer zones of 50m around the existing natural watercourses and 10m buffer around main drains have been used to inform the layout of the Proposed Project. › The drainage proposed within the Proposed Wind Farm site will not significantly alter the existing drainage regime within the Allen Bog Group. Moreover, the proposed drainage system will be fully integrated into the existing bog drainage systems. Existing field drains and main drains will be routed under/around access tracks using culverts as required.		
MM5	Preparative Site Drainage Management	Chapter 4 Appendix 4-4 Appendix 4-6	› A sufficient number of straw bales, clean drainage stone, terram, stakes, etc., will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures detailed in the above will be installed prior to, or at the same time as the works they are intended to drain.		

MM6	Drainage Inspection	Appendix 4-4 Appendix 4-6	› Prior to commencement of works in sub-catchments across the Project Site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.		
MM7	Watercourse Inspection	EIAR Chapter 4 Appendix 4-4	› Confirmatory inspections of the proposed watercourse crossing locations will be carried out by the Project Civil/Structural Engineer prior to the construction of the crossing.		
MM8	Drainage Maintenance	Chapter 4 Appendix 4-4 Appendix 4-6	› An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be carried out, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the EnvCoW. › If necessary, any excess sediment build up behind check dams will be removed. For this reason, check dams will be inspected and maintained weekly during the construction phase of the Proposed Project to insure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam. › Check dams will also be inspected following rainfall events to ensure the structure of the dam is still effective in controlling flow. Any scouring around the edges of the check dams or overtopping of the dam in normal flow conditions will be rectified by reinforcement of the check dam. › Drainage swales will be regularly inspected for evidence of erosion along the length of the swale. If any evidence of erosion is detected, additional check dams will be installed to limit the velocity of flow in the channel and reduce the likelihood of erosion occurring in the future.		

			› Peat ditch silt traps will be inspected weekly during the construction phase of the Proposed Project and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows. › A water level indicator such as a staff gauge or level marker will be installed in each temporary settlement pond with marks to identify when sediment is at 10% of the pond's capacity. Sediment will be cleaned out of the stilling pond when it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly during the construction phase of the project and following rainfall events. Inlet and outlets will be checked for sediment accumulation and impediments to flow. Any excess sediment build-up behind inlets and outlets will be removed.		
MM9	Earthworks	Appendix 4-6	› Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; › Avoid excavations within close proximity to surface watercourses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.		
MM10	Tree Felling/ Vegetation Removal	Chapter 4, 9 Appendix 4-4 Appendix 4-6	The following items will be carried out during pre-felling inspections and after: › Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions; › Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall; › Following tree felling all main drains will be inspected to ensure that they are functioning; › Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the Project Site, if impeded by silt or debris, will be unblocked; and,		

			› All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. Before the commencement of any vegetation removal works, an ECoW shall be appointed to oversee the works. The ECoW shall be experienced and competent, and shall have the following functions as proposed in the planning application: › Attend the site for the setup period when drainage protection works are being installed and be present on site during all vegetation removal works › Prior to the commencement of works, review and agree the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing, water crossings and onsite storage facilities for fuel, oil and chemicals; › Be responsible for preparing and delivering the environmental Toolbox Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works. › Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with the proposals outlined in Section 4.2 of the CEMP (Appendix 4-4); › Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures; ○ Collect water samples for analysis by a 3rd-party, accredited laboratory, adhering to the following requirements: ○ Sampling shall be taken from the stream/riverbank, with no in-stream access permitted; ○ The following minimum analytical suite shall be used: potential of Hydrogen (pH), Emulsifiable Concentrate (EC), Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), Total Phosphorus (Total P), Orthophosphate (Ortho-P), Total Nitrogen (Total N), and Ammonia; ○ Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions; ○ Prepare and maintain a contingency plan; ○ Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed; and		

			○ Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the EnvCoW.		
MM11	Traffic Management	EIAR Chapter 4, 15 Appendix 4-4 Appendix 15-2	› A detailed TMP has been prepared as part of the traffic impact assessment set out in Chapter 15 of this EIAR and is provided as Appendix 15-2. The deliveries of turbine components to the Proposed Wind Farm may be made in convoys of three to four vehicles at a time, and at night when roads are quietest. Convoys will be accompanied by escorts at the front and rear operating a "stop and go" system. Although the turbine delivery vehicles are large, they will not prevent other road users or emergency vehicles passing, should the need arise. The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users. › Prior to the TMP being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the TMP for agreement with the relevant authorities.		
MM12	Waste Management	EIAR Chapter 4 Appendix 4-4	› Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.		
Construction Phase					
MM13	Refuelling	EIAR Chapter 4, 8, 9 Appendix 4-4	› Refuelling and maintenance of construction vehicles and plant will, where practicable, be undertaken off-site at controlled, designated fuelling facilities. Where refuelling or maintenance is required on-site, it will be undertaken at designated areas in accordance with the CEMP and appropriate pollution prevention procedures; › On-site re-fuelling will be undertaken using a double skinned bowser or a refuelling truck with spill kits kept onboard;		

		Appendix 4-5 Appendix 4-6	› Only designated trained operatives will be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; › Fuel and oil stores including tanks and drums will be regularly inspected by the appointed EnvCoW for leaks and signs of damage; › The Proposed Onsite Substation and the Proposed Offsite Substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, › An emergency response plan for the construction phase to deal with accidental spillages is contained within the Section 6.1.4 of this CEMP.		
MM14	Concrete Based Products Deliveries and Management	EIAR Chapter 4, 9 Appendix 4-4	› No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; › Where possible pre-cast elements for culverts and concrete works will be used; › No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be isolated in temporary lined wash-out pits located near proposed site compounds. These temporary lined wash-out pits will be removed from the site at the end of the construction phase; › Any washing out of concrete pumping plant will also be into the temporary lined wash-out pits; › Will use weather forecasting to plan dry days for pouring concrete; and,		

			› Will ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.		
MM15	Concrete Pouring	EIAR Chapter 4, 9 Appendix 4-4 Appendix 4-5 Appendix 4-6	› Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. › Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete. › Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. › Ensuring that covers are available, and used, when necessary, for freshly placed concrete to avoid the surface washing away in heavy rain. › The small volume of water that will be generated from washing of the concrete truck's chute will be directed into a temporary, lined, impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. › Surplus concrete after completion of a pour will be taken off-site and disposed of at an appropriately authorised facility.		
MM16	Road Cleanliness	EIAR Chapter 4 Appendix 4-5	› Wheels or vehicle underbodies will be washed before leaving sites to prevent the build-up of mud on public (and site) roads. Internal site access roads will be constructed before other road-going trucks begin to make regular or frequent deliveries to the Project Site (e.g., with steel or concrete). The internal site access roads will comprise granular fill, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. › The contractor will be responsible for ensuring that all vehicles egressing the Project Site have used the wheel wash facilities. However, a road sweeper will be made available by the contractor for the cleaning of public roads in the event that they are dirtied by trucks associated with the Proposed Project.		
MM17	Proposed Internal Cabling Works	EIAR Chapter 4	› To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket.		

		Appendix 4-4 Appendix 4-6	› Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be backfilled into the existing trench.		
MM18	Water Discharge	EIAR Chapter 4 Appendix 4-4 Appendix 4-5 Appendix 4-6	› Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the Project Site where it might otherwise have come into contact with exposed surfaces and collected silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area. › There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses › All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e., 50m. › Dewatering silt bags are also used where water is pumped temporarily from excavations (e.g., turbine bases). Water is pumped into the silt bags, and then arising discharge is filtered through the silt bag fabric and flows into local collector drains. › Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas.		
MM19	Wastewater Management	EIAR Chapter 4	› All wastewater will be tankered off site by an appropriately licensed waste collector to wastewater treatment plants. It is not proposed to treat wastewater on site, and therefore the EPA's 2009 *'Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses'* (EPA, 2009) and the EPA's 1999 manual on *'Treatment Systems for Small Communities, Business, Leisure Centres and Hotels'* does not apply.		

			› Such a proposal for managing the wastewater arising on site has become standard practice on wind farm sites, which are often proposed in areas where finding the necessary percolation requirements for on-site treatment would be challenging and has been accepted by numerous Planning Authorities and ACP as an acceptable proposal. › The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Full details of the proposed tank alarm system will be submitted to the Planning Authority in advance of any works commencing on site.		
MM20	Collector Drains	EIAR Chapter 4 Appendix 4-4	› Collector drains will be installed downgradient of the main works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and collected silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Project Site and prevent it reaching natural watercourses. › Collector drains will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike.		
MM21	Interceptor Drains	EIAR Chapter 4, 9 Appendix 4-6	› Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the Project Site where it might otherwise have come into contact with exposed surfaces and collected silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. › Where required, interceptor drains will be installed in advance of any construction works commencing.		
MM22	Check Dams	EIAR Chapter 4 Appendix 4-5	› The velocity of flow in the interceptor drains and collector drains will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the drain is non-erosive. Check dams will also be installed in some existing artificial drainage channels present on the site under the IPC drainage network that will receive waters from works areas of the Project Site. › The check dams will be installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam is at the same level as the top elevation of the		

		Appendix 4-6	next down-gradient check dam in the drain. The centre of the check dam will be approximately 150mm lower than the edges to allow excess water to overtop the dam in flood conditions rather than cause upstream flooding or scouring around the dams. Check dams will not be used in any natural watercourses, only artificial drainage channels (field drains) and interceptor/collector drains. › Check dams will be inspected and maintained regularly to insure adequate performance during construction.		
MM23	Peat Ditch Silt Traps	EIAR Chapter 4 Appendix 4-6	› Silt traps will be installed in field drains downstream of drainage outfalls from works areas. › The peat ditch silt traps will be constructed using stacked timber logs, or marine plywood. These can also be covered in geotextile to enhance filtration.		
MM24	Vegetation Filters	EIAR Chapter 4 Appendix 4-6	› All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e. 50m.		
MM25	Temporary Construction Settlement Ponds	EIAR Chapter 4 Appendix 4-6	› Temporary construction settlement ponds will be used to attenuate runoff from main works areas (i.e., from turbine base/hardstand areas, construction compounds, and the substation) of the Project Site during the construction phase. › Settlement ponds will be located towards the end of collector drains, close to where the treated water will be discharged to existing IPC field drains/main drains. › During the construction phase, a water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond if it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and other issues that might interfere with flows.		
MM26	Silt Bags	EIAR Chapter 4	› Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method		

		Appendix 4-6	of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Project Site. › Dewatering silt bags are also used where water is pumped temporarily from excavations (e.g., turbine bases). Water is pumped into the silt bags, and then arising discharge is filtered through the silt bag fabric and flows into local collector drains. › Dewatering silt bags can also be used as an additional filtration measure downgradient of settlement ponds, wherever it is deemed appropriate, throughout the Project Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of peaty silt into any field drain/main drain.		
MM27	Over-The-Edge (OTE) Drainage	Chapter 4 Appendix 4-6	› Over-the-edge (OTE) drainage allows runoff from access tracks to flow into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations). › Silt traps and check dams will be installed in field drains downstream of OTE drainage areas, and these measures will provide attenuation and treatment of any arising dirty water.		
MM28	Clear Span Watercourse Crossings	EIAR Chapter 4 Appendix 4-4 Appendix 4-6	There are existing clear-span bridges present at 2 no. location (Proposed Wind Farm Crossing 4 and Proposed Wind Farm Crossing 7 as per Section 4.4.1.11 of Chapter 4 of the EIAR) that will be demolished prior to the construction of the new proposed clear-span crossings. The standard construction methodology for the installation of a clear-span bridge watercourse crossing is as follows: 1. *The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing.*		

			2. *All drainage measures along the proposed road will be installed in advance of the works.* 3. *A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along a 1m setback from the stream bank with no instream works required.* 4. *Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.* 5. *Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.* 6. *Where the bottomless box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse,* 7. *Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.* 8. *Underground cabling ducting will be contained within the road make-up of the proposed crossing.* 9. *Temporary works, bunds, and containment systems will be removed once approved by the ECoW.* 10. *Post-construction inspections will be carried out to confirm no sedimentation or pollution has occurred.* 11. *A final compliance report will be prepared and submitted as required by the regulatory authorities and the new bridge structure will be inspected annually by a competent civil engineer*		
MM29	Culvert Crossing	EIAR Chapter 4, 9.	› All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters must be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by		

		Appendix 4-4	the depth of the track or road sub-base but will have a minimum 900mm diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert. › Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary. › All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
MM30	Silt Fences	EIAR Chapter 4 Appendix 4-4	› Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50m buffer zone of a stream. Installation locations will be confirmed during the finalisation of detailed drainage design following a pre-construction survey. › Silt fences will be installed as single, double or a series of triple-silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects' published by CIRIA (No. C648, 1996). › Silt fence material will comprise Terrastop™ Premium material, and silt fences will be installed per the manufacturer's guidelines. Silt fences will be inspected on a regular basis to ensure that they are operating effectively.		
MM31	Proposed Grid Connection – existing services, joint bays and watercourse crossings	EIAR Chapter 4 Appendix 4-4	› Cable trenches are proposed to be constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences. This operation normally occurs over a period of 2-4 hours.		

			› To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. › Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be backfilled into the existing trench › Any underground services encountered along the Proposed Grid Connection underground electrical cabling route will be surveyed for level and the ducting will pass over the service provided adequate cover is available. › A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the Proposed Grid Connection ducting and bottom of the service will be achieved. In deeper excavations an additional layer of marker tape will be installed between the ducting and top-level yellow marker tape. › If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle where appropriate.		
MM32	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 Appendix 4-4	› The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter; › Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished turbine; › No material will be removed from the Proposed Wind Farm with excavated peat and spoil being transported to the identified peat and spoil areas within the site. › All groundwater and surface water arising from turbine base excavation will be pumped to the dirty water system prior to discharge from the works area;		

			› Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light; › The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the turbine foundation.		
MM33	Peat and Spoil Management	Appendix 4-3 Appendix 4-4 Appendix 8-1	› An interceptor drain will be installed upslope of the designated peat deposition areas to divert any surface water away from these areas. This will reduce the likelihood of debris run-off. › The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area. › The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to create the drain will be compacted on the downslope edge of the drain to form a diversion dike. As identified in the Peat and Spoil Management Plan (Appendix 4-3), the following recommendations/best practice guidelines for the placement of peat alongside the proposed infrastructure elements should be considered and taken into account during construction: › All excavated peat will be placed/spread alongside the proposed infrastructure elements on site, where possible. › The peat/spoil placed adjacent to the proposed infrastructure elements should be restricted to a maximum height of 1.5m over a 20m wide corridor on both sides of the proposed access roads, or up to a 50m wide area around hardstands. It should be noted that the designer should define/confirm the maximum restricted height for the placed peat/spoil. › The placement of excavated peat and spoil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat/spoil within the peat and spoil areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works. › Where there is any doubt as to the stability of the peat surface then no material will be placed on to the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface.		

			› The surface of the placed peat/spoil will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat and spoil areas will be carried out as placement of peat/spoil within the peat and spoil area progresses. This will reduce the likelihood of debris run- off and ensure stability of the placed peat/spoil. › Finished/shaped side slopes in the placed peat/spoil will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat and spoil are encountered then slacker slopes will be required. › Where present, the acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat/spoil within the placement areas. › Movement monitoring instrumentation may be required adjacent to the access road where peat/spoil has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on Project Site. › An interceptor drain will be installed upslope of the designated peat and spoil areas to divert any surface water away from these areas. This will help ensure stability of the placed peat/spoil and reduce the likelihood of debris run-off. › All the above-mentioned commitments will be undertaken by the Contractor during construction.		
MM34	Temporary Construction Compound	EIAR Chapter 4 Appendix 4-4	› Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by an appropriately permitted waste collector to wastewater treatment plants. › The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs, and associated settlement ponds will be installed around the perimeter; › A limited amount of fuel will have to be stored on the Project Site and for the grid connection in appropriately bunded containers, a bunded area for oil storage will be constructed within the compound. › The proposed 10 no. temporary construction compounds will consist of: bunded refuelling and containment area for the storage of lubricants, oils, and site generators, etc., temporary site offices, staff facilities, and car-parking areas for staff and visitors. › If necessary, the compound will be fenced and secured with locked gates.		

EIAR Chapter 5: Population and Human Health					
Pre-construction Phase					
MM35	Human Health	EIAR Chapter 5	› Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
MM36	Traffic and Transport	EIAR Chapter 5	A TMP has been developed in order to minimise any potential effect on the local population during the construction phase of the Proposed Project due to traffic.		
Construction Phase					
MM37	Human Health	EIAR Chapter 5 Appendix 4-4	The Proposed Project will be constructed in accordance with all relevant Health and Safety Legislation, including: › Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); › Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016); › S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and › Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2023. The following mitigation measures are detailed below: › A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage. › All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor		

			will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. SafePass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer and owners engineer are required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting site access during construction. Fencing will be erected in areas of the site where uncontrolled access is not permitted. › Appropriate warning signs will be posted, directing all visitors to the site manager. Appropriate warning measures including 'goalposts' will be used as appropriate to prevent contact with any overheads lines that traverse the site. › Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Project. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running over the site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the site are made aware of the location of lines before they come on to site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and onsite. › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2013 to 2021"' This will		

			encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) be appointed in accordance with the provisions of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'. The PSDP appointed for the construction stage shall be required to perform their duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; › Where possible, eliminate the hazards or reduce the risks; › Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; › Ensure that the work of designers is coordinated to ensure safety; › Organise co-operation between designers; › Prepare a written Safety and Health Plan; › Prepare a safety file for the completed structure and give it to the client; and › Notify the Authority and the client of non-compliance with any written directions issued. The PSCS appointed for the construction stage will be required to perform their duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Development of the Safety and Health Plan for the construction stage, with updating where required as work progresses; › Compile and develop safety file information. › Reporting of accidents / incidents; › Weekly Site meeting with PSCS;		

			› Coordinate arrangements for checking the implementation of safe working procedures. › Ensure that the following are being carried out: › Induction of all site staff including any new staff enlisted for the project from time to time; › Toolbox talks as necessary; › Maintenance of a file which lists personnel on site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; › Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; › Monitor the compliance of contractors and others and take corrective action where necessary; and › Notify the Authority and the client of non-compliance with any written directions issued.		
MM38	Air Quality: Dust Emissions	EIAR Chapter 5, 10 Appendix 4-4	› Truck wheels will be washed to remove mud and dirt before leaving the Project Site. All plant and materials vehicles will be stored in the compound area or other dedicated areas. Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. Construction traffic will be restricted to defined routes, and a speed limit will be implemented. › The active construction area along the Proposed Grid Connection underground electrical cabling route will be small, ranging from 100m to 150m in length at any one time. Should separate crews be used during the construction phase they will generally be separated by 1-2km. All construction machinery will be maintained in good operational order while on-site, minimising any emissions that are likely to arise. Aggregate materials for the construction of the cabling route will be sourced locally to reduce the amount of emissions associated with vehicle movements. › A wheel wash facility will be installed at all proposed construction site entrances and will be used by vehicles before leaving the Project Site. › Dust suppression measures, including water spraying of exposed surfaces and trafficked areas, will be implemented as required during dry weather conditions. In periods of extended dry weather, dust suppression will be necessary along Proposed Construction Haul Routes, site roads, grid route, road widening sections, substation, and construction compounds to ensure dust does not cause a nuisance.		

			○ If necessary, such as during periods of dry weather, de-silted water will be taken from stilling ponds via the existing drainage system within the Allen Bog Group, which encompasses part of the Proposed Project, and will be pumped into a bowser or water spreader to dampen down internal access roads, turbine bases and site compounds to prevent the generation of dust where required. ○ Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff as outlined in the CEMP. › Turbines components, construction materials and grid connection infrastructure will be transported to the Project Site via Proposed Construction Haul Routes, as agreed with the local authority. ○ The Proposed Construction Haul Routes adjacent to the Project Site will be regularly inspected for cleanliness and cleaned as deemed necessary by the construction Site Supervisor/Site Manager. › Waste material will be transferred to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. ○ The MRF facility will be local to the site to reduce dust emissions associated with vehicle movements. The nearest licensed waste facility located are: • Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the nearest Proposed Turbine (T32). • Drehid Landfill, located approximately 6.5 km northeast of the nearest Proposed Turbine (T30). • Chem Regen, located approximately 25.5 km southwest of the nearest Proposed Turbine (T14). • Cleary Compost & Shredding Ltd. located approximately 24.9 km south of the nearest Proposed Turbine (T14). • Soltec (Ireland) Ltd, located approximately 31.5 km northwest of the nearest Proposed Turbine (T32). • Allied Recycling, located approximately 9.2km south of the Proposed Offsite Substation.		

			› Temporary Construction Compounds are spread out throughout the Project Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further dust emissions. › All HGVs transporting construction materials to and from the Project Site will be covered with suitably secured tarpaulin sheeting to prevent dust emission during transit along Proposed Construction Haul Routes. › Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Project Site, particularly during extended dry periods › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › The ECoW will perform daily visual site inspections of dust occurrence within the Project Site during construction, particularly during periods of dry weather and windy conditions. This will be noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site. ○ The ECoW will have power to halt construction works if required. › The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m2/day (for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Project Site. Where dust levels are measured to be above this, mitigation measures will be reviewed.		
MM39	Air Quality: Exhaust Emissions	EIAR Chapter 5, 10	› All construction vehicles and plant used during construction will be maintained in good operational order while onsite. If any vehicle requires repair, this work will be carried out, thereby minimising any emissions that arise. › Turbines components and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. › All machinery will be switched off when not in use. › Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.		

			› Aggregate materials for the construction of the internal access road network and all associated infrastructure will all be locally sourced where possible, which will further reduce potential emissions. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Project Site. Therefore, all waste streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF will be local to the Project Site to reduce the amount of exhaust emissions associated with vehicle movements. ○ Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the nearest Proposed Turbine (T32). ○ Drehid Landfill, located approximately 6.5km northeast of the nearest Proposed Turbine (T30). ○ Chem Regen, located approximately 25.5km southwest of the nearest Proposed Turbine (T14). ○ Cleary Compost & Shredding Ltd. located approximately 24.9km south of the nearest Proposed Turbine (T14). ○ Soltec (Ireland) Ltd, located approximately 31.5km northwest of the nearest Proposed Turbine (T32). ○ Allied Recycling, located approximately 9.2km south of the Proposed Offsite Substation. › Temporary Construction Compounds are spread out throughout the Project Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further exhaust emissions.		
MM40	Climate	Chapter 5, 11	› Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.		

			› When stationary, delivery and on-site vehicles will be required to turn off engines. › Turbines and construction materials will be transported to the Project Site along the Proposed Construction Haul Routes and Proposed Turbine Delivery Route only unless otherwise agreed with the Planning Authority. Please see Section 15.1.X of Chapter 15 Material Assets for details. › Aggregate materials for the construction of the internal access road network and all associated infrastructure will all be locally sourced where possible, which will further reduce potential emissions. › A CEMP (Appendix 4-5) will be in place throughout the construction phase. › The CEMP (Appendix 4-5) includes a RWMP which outlines the best practice procedures that will occur during the construction phase relating to waste material. › The RWMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. › Section 4.6.9 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor. › The MRF facility will be local to the Project Site to reduce the number of emissions associated with vehicle movements. ○ Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the Proposed Turbine (T32). ○ Drehid Landfill located approximately 6.5km northeast of the Proposed Turbine (T30). ○ Chem Regen located approximately 25.5km southwest of the Proposed Turbine (T14). ○ Cleary Compost & Shredding Ltd. located approximately 24.9km south of the Proposed Turbine (T14). ○ Soltec (Ireland) Ltd, located approximately 31.5km northwest of the Proposed Turbine (T32). ○ Allied Recycling located approximately 9.2 km southeast of the Proposed Offsite Substation.		

			› Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
MM41	Noise and Vibration	Chapter 5, 12 Appendix 4-4	› 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'*. › The assessment of potential impacts presented in Section 12.7.1 of Chapter 12 has demonstrated that the Proposed Project is expected to comply with the noise and vibration criteria during the construction phase and therefore no specific mitigation measures are required. › 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.		
MM42	Major Accidents and Natural Disasters	EIAR Chapter 5, 8, 9, 16 Appendix 4-4	› The Proposed Project is designed and will be constructed in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission '*Guidance on the preparation of Environmental Impact Assessment Reports'* 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures. › Potential effects associated with contamination during construction are addressed fully in Chapter 8: Land, Soils and Geology and Chapter 9: Water of the EIAR. Potential effects associated with bog fires during construction are addressed within Chapter 17: Major Accidents and Natural Disasters, Additionally, potential effects associated with peat instability is detailed in Chapter 8: Land, Soils and Geology. The mitigation measures outlined therein to protect environmental receptors as well as the procedures and measures described in the CEMP will ensure that the risk from these sources is low. › A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of the EIAR. Upon a grant of planning permission for the Proposed Project, the CEMP will		

			be updated prior to the commencement of the development. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided, and mitigated, as necessary. Refer to Appendix 4-4 for the CEMP that sets out the minimum standards to be employed by the contractor. › Appropriate fire prevention and response measures will be implemented in accordance with best practice and relevant guidance, including: ○ The safe storage and handling of fuels and flammable materials; ○ Provision of firefighting equipment onsite; ○ Implementation of emergency response procedures; and ○ Staff training and awareness. › Any use of tall structures including cranes above 45m such are subject to notification to the IAA 30 days prior to erection. As per Table 4-28 in Chapter 4 of the EIAR, it is proposed that Proposed Turbine erection will take 21 months to be completed. › Flight within the airspace above the Aviation Study Area would be conducted via IFR or VFR, both require following the regulation applicable to IFR or VFR Flight.		
EIAR Chapter 6 Biodiversity					
Pre-construction					

MM43	Flora and Fauna	EIAR Chapter 6	**Otter** No otter holts were recorded within 150m of any Proposed Project infrastructure during any of the surveys undertaken. However, it is noted that this is a mobile species and otter could potentially migrate within the Project Site. As such, prior to the commencement of construction works associated with the installation of watercourse crossings, a pre-commencement otter survey will be undertaken to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2008b). This will be undertaken by a suitably qualified ecologist in accordance with standard best practice guidance. **Badger** Due to the time that may elapse between the surveys undertaken to inform this assessment and the commencement of construction works, a pre-construction badger survey of the Proposed Project footprint and adjacent areas will be carried out by a qualified ecologist to determine whether any setts have been established in the intervening period. This will include a 50m buffer of all infrastructure, a 150m buffer of any areas where piling works are proposed, such as Proposed Turbine bases, as well as areas where felling is proposed (i.e. within the Proposed Enhancement Areas). All setts identified within this Biodiversity Chapter will also be re-surveyed in order to establish their status prior to the commencement of construction works, and to identify any additional sett entrances which may have been excavated in the intervening period.		
Construction Phase					
MM44	Surface Watercourses and Sensitive Aquatic Faunal Species	EIAR Chapter 6, 9	A drainage design for the Proposed Project is provided in Section 4.7 of Chapter 4 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Project. In addition to this, specific mitigation is provided in relation to protection of surface water quality is provided in Chapter 9: Water of this EIAR, see Section 9.5. These mitigations relate to earthworks, vegetation removal, potential release of hydrocarbons during construction and storage, contamination from wastewater disposal, groundwater impacts, flooding impacts, and release of cement-based products.		

MM45	Bats	EIAR Chapter 6 Appendix 6-2 Appendix 6-5	**Bats** The below describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations. <u>Noise Restriction</u> › During the construction phase, all plant and equipment will be operated in accordance with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended). Plant machinery will be switched off when not in use, and works will be managed to minimise unnecessary noise generation. › Methodology and mitigation outlined in Chapter 12: Noise and Vibration will be followed to minimise noise and vibration during construction. › A minimum 10m buffer will be maintained between the Proposed Onsite Substation and Proposed Offsite Substation fence lines and the nearest retained linear habitat features. The treelines and hedgerows surrounding the Proposed Onsite Substation and Proposed Offsite Substation will be retained as bat commuting and foraging habitat. <u>Lighting Restriction</u> › During the construction phase, lighting requirements will be temporary and limited to areas where required for health, safety and security purposes, including temporary compounds and works associated with the Proposed Onsite Substation and Proposed Offsite Substation. Where works are required during hours of darkness, lighting will be directed away from retained woodland, treelines, hedgerows, and bat commuting or foraging habitats. Directional accessories, including baffles, hoods, cowls and louvres, will be used where appropriate to reduce light spill and focus illumination only where required. The same restrictions will apply during decommissioning. › All permanent lighting will utilise warm-spectrum LED sources with a correlated colour temperature of 3000K or less. Lighting will be designed and operated to maintain dark		

			commuting corridors along retained habitat features and avoid fragmentation of bat commuting routes. › A buffer of dark, unlit habitat will be maintained between the Proposed Onsite Substation and Proposed Offsite Substation fence line and the nearest retained treeline or hedgerow › The lighting measures will also follow Dark Sky Ireland principles by ensuring that lighting is used only where necessary, appropriately directed and maintained at the minimum intensity required for operational and safety purposes. <u>Biodiversity Management Plan</u> › The Project Site is predominantly located within cutover bog, with smaller areas of scrub, Calluna-dominated communities on Cutover bog, bog woodland, and sparse linear features such as hedgerows and treelines. These areas of hedgerows and treelines have been largely retained or avoided. However, there will be a requirement to remove 44.3ha of bog woodland habitat, 131.7ha of scrub and 60.7 ha of conifer plantation to facilitate the Proposed Wind Farm. While the Proposed Offsite Substation and the Proposed Turbine Delivery Route accommodation areas will require the removal of approximately 38m of Treeline habitat. These treelines will be replanted once works are completed. › As part of the BMP, it is proposed to plant a total of 45.3ha of native trees which over time will develop into native scrub and woodland habitat. All planting will consist of species indigenous to the local area. The BMP also proposes to create 246ha of scrub mosaic habitats, which combined with native tree planting will result in a net gain of these habitats. As well as habitat creation the BMP proposes the instalment of artificial roosting features which will be incorporated within the Proposed Wind Farm site to enhance roost availability and strengthen the ecological functionality of the landscape for bats. The enhancement measures will comprise a minimum of 15 no. bat boxes. Bat boxes will not be placed within the Proposed Turbine risk area to avoid encouraging bats to roost or forage within rotor-swept zones. All placements will be at the edges of the Proposed Wind Farm, near existing linear features leading away from turbines or within Killina Bog Offsetting Area and Lodge Bog Enhancement area. › Overall, the proposed planting of native trees along with the creation of scrub mosaic habitats, will result in a net gain of scrub and woodland habitats within the Project Site.		

			Alongside the instalment of artificial roosting features these measures will enhance both the roosting potential and the foraging and commuting opportunities for bats that use the area. **Collision Risk Mitigation Measures** <u>Bat Felling Buffers</u> In accordance with NatureScot (2021), Northern Ireland Environment Agency (NIEA) (2021) and Bat Conservation Ireland (BCI) (2026), a minimum 50m buffer is applied between turbine blade tips and habitat features used by bats (e.g. hedgerows, treelines and woodland edges), to reduce the risk of bat activity occurring within the rotor-swept zone. A 50m buffer between turbine blade tip and the nearest habitat feature will be implemented, based on the turbine specification for the two proposed turbine models (tip height: 200m and 220m; rotor diameter: 170m; hub height: 115m and 135m). These buffers were calculated using the Natural England formula (Plate 6-1) and have been incorporated into the Proposed Turbine layout. The application of these buffers forms a key embedded mitigation measure to reduce collision risk, particularly for high-risk species such as Leisler's bat and pipistrelle species, which utilise linear landscape features for commuting but also forage more widely in open habitats. Maintaining separation from these features reduces the likelihood of bats moving through the rotor-swept zone during commuting movements. To facilitate these buffers, areas of scrub, woodland, conifer plantation and other vegetation will be removed or managed within the Proposed Wind Farm in tandem with the golden plover offsetting areas. These areas will be maintained as vegetation-free (i.e. less than 2m in height) by hand or other mechanical means as appropriate throughout the operational life of the Proposed Wind Farm. This ensures that no new edge habitats or linear features develop within the buffer zone that could attract bat activity towards turbine locations. Should it prove impracticable to maintain the required buffer condition in any location, alternative mitigation measures, including turbine curtailment and/or other measures informed by updated bat activity data, carcass searches and best practice guidance, will be developed and implemented to maintain an equivalent level of protection for bats.		

			Blade Feathering NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below 3m/s, the cut-in speed of the Proposed Turbines. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). Blade feathering below the turbine cut-in speed is expected to be implemented automatically through the turbine control system. Feathering will be limited to periods and locations as follows: › Seasonal Application: Feathering will be applied at all Proposed Turbine locations during the main bat activity season (typically April–October) between dusk and dawn only when wind speeds are below the below the cut in speed and there is less than 0.5mm/hr of rain fall. This is when bats are active and at potential increased risk of collision for the duration of the operational life of the wind farm. Blade feathering will not be applied during winter months (November - March) when bats are largely inactive. › Spatial Targeting: Feathering will be implemented only at Proposed Turbines located in areas of high bat activity, as identified through baseline surveys. Proposed Turbines positioned in habitats unsuitable for bats (e.g., extensive bare peat, exposed upland areas with no foraging or commuting value) will not require feathering at low wind speeds. Section 5.1.2 of Appendix 6-2 outlines areas which recorded high bat activity for high collision risk bat species.		

			Should any variations in activity, significant fatalities be recorded or risk levels be identified during post-construction monitoring, turbine specific adjustments will be implemented which could include increasing the cut-in speed i.e. curtailment. In the event that blade feathering is not available for the selected turbine model, an equivalent operational measure will be implemented to ensure that the Proposed Turbines do not rotate at low wind speeds when electricity generation is not occurring. This may include operational controls such as manual stop or stop-on-demand procedures during periods when the Proposed Turbines would otherwise idle below cut-in speed.		
MM46	Habitats	EIAR Chapter 6, 9 Appendix 6-5	**Aquatic Habitats** The following mitigation measures will be strictly adhered to during the works within the Proposed Wind Farm site: › Clear-span bridge crossings will be designed to span the watercourse without disturbance to the watercourse bed and with abutments located outside the channel where practicable; › Where bottomless culverts are proposed, the natural watercourse bed will be retained through the crossing where practicable. Construction will be undertaken from outside the channel. › Where box culverts or pipes are proposed, the crossing will be suitably sized for the expected peak flows and designed to maintain hydraulic conveyance. Any works required within or immediately adjacent to the watercourse will be undertaken in accordance with the relevant OPW and IFI requirements. › Existing crossings requiring upgrading or replacement will be constructed in a manner that minimises disturbance to the existing watercourse and its banks. Where existing structures are to be removed, works will be undertaken in accordance with the approved construction methodology. › All guidance / mitigation measures required by the OPW and/or the IFI is incorporated into the design of the proposed crossings. › All drainage measures will be installed in advance of the works. › Plant and equipment will not be permitted to track across the watercourse.		

			› Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge. › As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document '*Guidelines on protection of fisheries during construction works in and adjacent to waters*[8]', i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI). › All in-stream works will be undertaken in line with IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters and OPW (2019) Environmental Guidance: Drainage Maintenance and Construction[9]. › All in-stream works will be supervised by an ECoW, who will have the power to halt works if non-compliance is observed. › All operatives will be trained in how to address the environmental risks and best practice measures. › In accordance with OPW (2019), in order to accommodate lamprey spawning and berried, white-clawed crayfish (i.e. carrying eggs), no works may be carried out from end March to mid-July. › In order to minimise causing direct physical damage and mortality of species living in the riverbed, the temporary dam will be constructed using sandbags and these will be placed at an extremely slow pace, such that any animals within the vicinity of the footprint will have a chance to leave for alternative suitable areas before potentially harmful effects. › Prior to the commencement of works, Section 14 Authorisation from the Inland Fisheries Division of the Department of Environment, Climate and Communications will be obtained. Prior to the pumping out of water from the enclosure, electrofishing will be carried out within the dammed area, and any recovered aquatic individuals will be relocated by the ECoW to suitable similar river habitat downstream of the works location, under licence.		

[8] IFI (2016) Guidelines on the Protection of Fisheries During Construction Works and Adjacent to Waters. Inland Fisheries Ireland.
9 Brew, T., Gilligan, N., 2019, Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section, Office of Public Works, Trim, Co. Meath, Ireland.

			› Only after electrofishing is complete and any fish species are removed, if present, may the water from within the dammed area begin to be pumped out from within this temporary works area. › Machinery, construction equipment and construction materials will not enter the water; the works will only occur after the dry working area is created. › All machinery, PPE and equipment used within the watercourse will be thoroughly cleaned and disinfected using a broad-spectrum cleaner (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) prior to entering the watercourse and after removal from the watercourse to ensure biosecurity is upheld and limit the spread of invasive species and infectious waterborne diseases. This will occur within a designated wash-down area, which will be underlain by a washable membrane or hard surface. **Raised Bog** The Proposed Project has been deliberately designed to minimise the loss of uncut raised bog within the Project Site, with only the proposed amenity boardwalk in the southernmost area of Ballydermot South Bog located within this habitat. While no significant effects are anticipated as a result of this boardwalk, it will be installed using sensitive methodologies in order to ensure that no accidental loss of or excessive disturbance to this habitat will occur. The boardwalk will be installed above the raised bog which will be supported on timber piles driven into position by hand or using lightweight/low pressure mechanical means to reduce ground disturbance. **Cutover Bog and Associated Secondary Habitats** A BMP has been prepared for the Proposed Project which provides for the ecological enhancement of an area of approximately 263.8ha of cutover bog through drain blocking and rewetting measures. This will help to raise the water table and promote the development of wetland vegetation. The areas proposed for enhancement measures are located in four blocks (labelled A-D, see Figure 6-5-2 of the BMP, Appendix 6-5) located in Ballydermot North, Codd 1, Codd 2 and Ticknevin Bogs, sensitively designed around the peripheries of the Project Site in order to prevent ornithological conflicts with the Proposed Wind Farm during operation. The areas proposed for peatland enhancement have been heavily drained through the insertion of parallel drains and extensively cutover during the peat extraction phase of the Allen Bog Group and are currently largely dominated by bare peat.		

			Additionally, the BMP prescribes the management and enhancement of approximately 339ha of Lodge Bog. This will involve a range of measures, including scrub removal and management, the creation of permanent waterbodies as well as the creation of permanent reed beds. These measures are primarily proposed to serve breeding and wintering bird populations within the Project Site, as described in Chapter 7 Birds of the EIAR, however these measures will also result in the creation of additional areas of reed and large sedge swamp and poor fen communities where water levels and vegetation are to be managed. Furthermore, an area of approximately 58ha of conifer plantation within Killina Bog will be cleared in order to create open habitat suitable for golden plover. This will involve the permanent removal of the existing forestry, and the area will be allowed to revert to peatland habitat, which will be aided by the blocking of forestry drainage channels where appropriate.		
MM47	Flora and Fauna	EIAR Chapter 6	**Flora** The following mitigations will be applied during the construction phase of the Proposed Project in order to ensure that there are no significant effects on populations of these species: › Pre-commencement surveys for basil thyme and round-leaved wintergreen will be undertaken at the optimal time of year (i.e. July to August for basil thyme and June to July for round-leaved wintergreen) by a suitably qualified ecologist in advance of construction and any felling measures. The surveys will focus on the footprint of the Proposed Project (inclusive of the enhancement areas in Killina Bog) within the part of the Project Site located within part of the Allen Bog Group where the species have previously been recorded. Due to the time that may elapse between surveys undertaken to inform this assessment and the commencement of construction works, as well as the annual life cycle of basil thyme, other areas of suitable habitat within the Proposed Project construction footprint, in proximity to previously mapped populations, will also be surveyed for newly colonised plants. › If these species are found within the construction footprint, plants will be mapped.		

			› Where the species are identified within the Proposed Project footprint, the ecologist will also identify suitable translocation areas for each species outside of the construction footprint and beyond the Zone of Influence (ZoI) of the Proposed Project. <u>Basil thyme:</u> › Existing plants identified within the Proposed Project infrastructure footprint will be carefully excavated by hand by the ECoW with a shovel ensuring that the root system and surrounding rooting substrate remain intact. These plants will be moved to a prepared area outside the construction footprint with suitable substrate and habitat conditions for the calcicole species, as identified by the ECoW during the pre-commencement survey. › As this is an annual species, subsoil with the seedbank will also be translocated out of the Proposed Project footprint. Following the removal of the plants, the gravel/subsoil from these areas within the Proposed Project infrastructure footprint will be stripped and reinstated at proposed new suitable locations. The locations of the reinstatement areas will be identified by a suitably qualified ecologist in advance of reinstatement works. During reinstatement a thin layer of the stripped gravel/subsoil, containing the residual floral seed bank, shall then be spread evenly over gravel substrate. These works will be supervised by the ECoW. › These areas shall then be temporarily fenced off and allowed to regenerate naturally. <u>Round-leaved wintergreen</u> › As round-leaved wintergreen is a perennial species, large turves containing the plants identified and mapped during the pre-commencement surveys which overlap the construction footprint will be translocated as follows: › Translocation will be planned during a metabolically less active time of year for round-leaved wintergreen (winter months). › These turves will be relocated to other suitable habitat nearby with appropriate levels of shading, an appropriate hydrological regime and appropriate substrate for the species. › The receptor site will be appropriately prepared for receiving the turves by removing no more than 10cm of topsoil from the receptor areas.		

			Otter No otter holts were recorded within 150m of any Proposed Project infrastructure during any of the surveys undertaken. However, it is noted that this is a mobile species and otter could potentially migrate within the Project Site. As such, prior to the commencement of construction works associated with the installation of watercourse crossings, a pre-commencement otter survey will be undertaken to ensure that no otter holts'/breeding sites have been established since the original surveys undertaken (TII, 2008b). This will be undertaken by a suitably qualified ecologist in accordance with standard best practice guidance. In the unlikely event that an otter holt is identified within the ZoI of the Proposed Project infrastructure, or within Lodge Bog, consultation will be undertaken with the NPWS and a derogation licence applied for, in line with TII (2008b) *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*. › All conditions of a derogation licence will be implemented in full. › No works will be undertaken within 150m of any holts at which breeding females or cubs are present. › No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence › All of the above works will be undertaken or supervised by an appropriately qualified ecologist. **Badger** › To protect individual badgers during the construction phase of the Proposed Project, all open excavations on site will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night and any deep excavations left open will have appropriate egress ramps in place to allow mammals to safely exit excavations should they fall in.		

			› Due to the time that may elapse between the surveys undertaken to inform this assessment and the commencement of construction works, a pre-construction badger survey of the Proposed Project footprint and adjacent areas will be carried out by a qualified ecologist to determine whether any setts have been established in the intervening period. This will include a 50m buffer of all infrastructure, a 150m buffer of any areas where piling works are proposed, such as Proposed Turbine bases, as well as areas where felling is proposed (i.e. within the Proposed Enhancement Areas). All setts identified within this Biodiversity Chapter will also be re-surveyed in order to establish their status prior to the commencement of construction works, and to identify any additional sett entrances which may have been excavated in the intervening period. › All badger setts will be afforded protection in line with the requirements set out in TII (2006) *Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes*. An exclusion zone around all identified setts will be maintained for the duration of the construction works. No works will be undertaken within 30m of any badger setts at any time, and during the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts or pile driving within 150m of active setts. If such works are required, exclusion measures will be put in place prior to construction in line with TII (2006) to ensure that the sett is evacuated. Should a badger sett require exclusion, the following steps will be undertaken to ensure that no badgers are present within the sett during construction works, in line with TII (2006): › Early consultation with the NPWS will be undertaken in advance of any works. › The closure and subsequent destruction of a sett may only be carried out following successful evacuation and must be undertaken under the supervision of suitably qualified and experienced personnel. › Exclusion from an active sett should only be undertaken during the period July to November (inclusive), in order to avoid the badger breeding season. › Standard exclusion methodology involves the installation of one-way gates at all active entrances, followed by a minimum monitoring period of 21 days (commencing after an initial settling period of approximately three days), to confirm that no badgers remain		

			within the sett. An ecologist will monitor the gates every 3 to 5 days during t 21-day period to ensure badgers do not succeed in re-entering the sett. › Immediately following this and subject to successful exclusion, the sett may then be closed under supervision. › If badgers succeed in re-entering during the 21-day period, the exclusion process and 21-day period must start again. › A post-works report detailing the exclusion methodology, monitoring results, sett excavation and closure, and any other relevant observations will be submitted to the NPWS. **Other Non-volant Mammals** Due to the time that can elapse between the original surveys, any future planning consent and construction, a pre-commencement survey for non-volant mammals will be carried out in areas of suitable habitat within the Proposed Project infrastructure footprint, and all suitable habitat within 50m of the construction footprint and within woodland and forestry felling areas associated with bat felling buffers and proposed enhancement areas. Surveys will be undertaken by suitably qualified ecologists and in line with NatureScot and TII (2008a) guidelines. **Marsh Fritillary** The Proposed Project has been designed, through an iterative design process, to avoid suitable marsh fritillary habitat where possible, based on surveys carried out in 2024 and 2025. The Proposed Project layout was thereby altered where possible to avoid loss of high-quality habitats and key breeding habitat for marsh fritillary. Consequently, all aspects of the Proposed Project are located over 150m from Lullybeg Nature Reserve and over 60m from the nearest key supporting habitat outside the reserve. Construction and felling/scrub clearance works will occur in areas overlapping as well as in proximity to identified marsh fritillary-populations on the Project Site. The following mitigations will be applied during the construction phase:		

			› A pre-commencement survey for marsh fritillary larval webs will be undertaken at the optimal time of year in advance of construction (in line with 2008a) within all areas of marsh fritillary suitable habitat within and adjacent to the footprint of the Proposed Project. › If active larval webs are recorded within the construction or felling footprint, these webs will be translocated by the ECoW to adjacent suitable existing foraging habitat outside of the construction footprint and the ZoI of the Proposed Project. This will be achieved by translocating a sod of earth with entire, intact devils' bit scabious plants upon which the larvae are feeding. › Larval webs and associated food plants will only be translocated by the ECoW to existing breeding areas as shown in Confidential Appendix 6-5. › ECoW supervision will be required for construction of components near existing breeding areas. › Where suitable marsh fritillary habitat occurs in close proximity to Proposed Project infrastructure, side casting of material will be to the opposite side of the Proposed Project infrastructure to where the suitable habitat occurs. All of the above works will be undertaken or supervised by an appropriately qualified ecologist.		
MM48	Invasive Species	EIAR Chapter 6 Appendix 4-4	The following best practice biosecurity measures will be in place during construction of the Proposed Project to avoid the introduction of invasive species to the Project Site: › Good construction site hygiene will be employed to prevent introduction of problematic invasive alien plant species (e.g., Japanese knotweed, Rhododendron, Giant Rhubarb, etc.) to the site by thoroughly washing vehicles at designated off-site wheel-wash facilities prior to entering the Project Site. › Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.		

EIAR Chapter 7 Ornithology					
Pre-Construction/Construction Phase					
MM49	Design of the Proposed Project	EIAR Chapter 7 Appendix 7-6	› Hard standing areas have been designed to the minimum size necessary to accommodate the turbine model that is selected. › The Proposed Grid Connection routes have been selected to utilise built infrastructure for the majority of its length (i.e. cables to be laid within public roads). Cables will be laid underground to avoid effects on roadside hedgerows and disturbance to nesting birds. › Following best practice, the 0.12km of OHL will include line markers to increase their visibility to bird in flight. › An initial assessment of the possibility of removing turbines from the Proposed Wind Farm was considered to avoid significant collision risk impacts on golden plover. However, given that flight activity of golden plover is throughout the Core Ornithology Survey Area, no specific turbine/turbines are the cause of the significant effect. The significant effect is largely related to the scale of the Proposed Wind Farm and the presence of suitable roosting habitat for golden plover throughout the Core Ornithology Study Area. Therefore, avoiding the cause of the significant collision risk through project design and turbine layout was not a feasible option (see details in Appendix 7-6). Mitigation and offsetting measures are therefore proposed within the Biodiversity Management Plan. › The Proposed Onsite Substation was sited outside the disturbance distance of 800m (830m separation distance) from the historic curlew nest adjacent to the Core Ornithology Study Area.		
MM50	Construction and Environmental Management Plan	EIAR Chapter 7, 9, 12 Appendix 7-7	› Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Any requirement for construction works to run into the breeding seasons following commencement will be informed by pre-construction bird surveys. › The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.		

			› During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. Please see Section 12.7 of Chapter 12 for more detail associated with noise during the construction phase. › Water protection measures will be implemented during the construction phase as outlined in Section 9.5.2 of Chapter 9, to protect downstream watercourses. › A pre-construction bird survey at the Proposed Wind Farm will be organised to ensure that any sensitive roost or nest sites in the works area are identified and disturbance to these are avoided. Further details are provided in Appendix 7-7. › An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: ○ Organise the undertaking of pre-construction and construction phase confirmatory bird surveys to avoid impacts on birds. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Project Site. ○ Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise. ○ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. ○ Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary. › If winter roosting or breeding activity of birds of high conservation concern are identified, the roost or nest site will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		
MM51	Birds	EIAR Chapter 7 Appendix 6-5	**Golden Plover** › Collision risk: to mitigate significant collision risk effects it is proposed to make the habitat near the Proposed Turbines unsuitable, attract golden plover to low risk areas away from the Proposed Turbines and monitor collision risk. If collision rates exceed a set threshold,		

			curtailment would apply. Please see Appendix 6-5 for full details of how this mitigation will be implemented. › Curtailment: Carcass monitoring and vantage point monitoring surveys will inform curtailment requirements. In the event that golden plover mortality caused by the Proposed Turbines exceeds ten birds per winter season, the turbines determined most likely to have caused these fatalities will curtailed for the remainder of the winter season. Monitoring will be repeated every winter with the results of each winter informing curtailment for that season. The threshold of ten birds was determined to be sufficient to reduce the collision risk on the local population to Not Significant. › Habitat loss: to offset the significant habitat loss effect, habitat restoration and creation is proposed. This enhancement is proposed at Lodge Bog, and the creation of habitat is proposed at Killina Bog. Please see Appendix 6-5 for full details of how this will be implemented. **Hen Harrier** › Displacement: to offset significant displacement effects from the Proposed Turbines, habitat restoration and creation is proposed at Lodge Bog. Please see Appendix 6-5 for full details of how this will be implemented. **Whooper Swan** › Habitat loss: to offset the significant habitat loss effect habitat restoration and creation is proposed. This enhancement is proposed at Lodge Bog. Please see Appendix 6-5 for full details of how this will be implemented. › Disturbance and displacement: to offset significant disturbance effects during the construction phase and displacement during the operational phase, habitat restoration and creation is proposed to attract whooper swan away from the source of disturbance or displacement. This enhancement is proposed at Lodge Bog. Please see Appendix 6-5 for full details of how this will be implemented.		

			Lapwing (Breeding) › Habitat loss: to offset the significant habitat loss effect, habitat restoration and creation is proposed. This enhancement is proposed at Lodge Bog, and the creation of habitat is proposed at Killina Bog. Please see Appendix 6-5 for full details of how this will be implemented. › Disturbance and displacement: to offset significant disturbance effects during the construction phase and displacement during the operational phase, habitat restoration and creation is proposed. This enhancement is proposed at Lodge Bog, and the creation of habitat is proposed at Killina Bog. Please see Appendix 6-5 for full details of how this will be implemented. **Snipe** › Disturbance and displacement: to offset significant disturbance effects during the construction phase and displacement during the operational phase, breeding habitat restoration and creation is proposed. This enhancement is proposed at Lodge Bog, and the creation of habitat is proposed at Killina Bog. Please see Appendix 6-5 for full details of how this will be implemented. **Proposed Actions** › 0-50m surrounding all turbines: to be planted with rush mosaic and rush mosaic promoted through side casting excavated soils to discourage waders (golden plover, lapwing, snipe) from flying among and around turbines with the intention of utilising open areas for foraging/roosting. The planting of rush in this buffer will reduce open areas to below 10ha while not encouraging bats to the area around the base of turbines. › 50-250m surrounding all turbines: to be planted with scrub mosaic habitat to discourage waders (golden plover, lapwing, snipe) from flying among and around turbines with the intention of utilising open areas for foraging/roosting. The planting of scrub in smaller patches (0.1-5ha) within larger open areas to fragment these open areas to below 10ha. › Lodge Bog Enhancement Area: to offset the habitats lost to the mitigation measures within 250m of all turbines, open areas will be enhanced/created through scrub removal and		

			management, permanent waterbody creation for whooper swan, creation of breeding wader areas and installation of predator proof fencing. › Killina Offsetting Area: to offset the habitats lost to the mitigation measures within 250m of all turbines, forestry will be removed and vegetation sward will be kept at the optimal height for waders, including golden plover. Golden plover decoys will be placed in the newly created open area to draw circling flocks which look for other birds on the ground. › Monitoring of offsetting areas for alignment with objectives will be put in place and measures will be adapted as required to ensure the efficacy of mitigation for the lifetime of the project. Further detail on these actions are outlined in Appendix 6-5.		
EIAR Chapter 8 Land, Soils & Geology					
Construction Phase					
MM52	Peat and Subsoil Excavation	EIAR Chapter 4, 8	› Placement of Proposed Turbines and associated infrastructure in areas with shallower peat where constraints allow; › Use of floating roads (approximately 56.6km), where appropriate, to reduce peat excavation volumes; › The peat and spoil which will be removed during the construction phase will be transported immediately on excavation to designated peat and spoil areas alongside the hardstands and access roads or used for landscaping; › The Proposed Project has been designed to avoid sensitive habitats; › A minimal volume of peat and subsoil will be removed to allow for infrastructural work to take place in comparison to the total volume present due to optimisation of the layout by mitigation by design; › Excavated peat and spoil will only be moved short distances from the point of excavation and will be used locally for landscaping; › Excavated peat and spoil that is not used locally for landscaping will be stored in the designated peat and spoil areas; and, › Construction of settlement ponds will be volume neutral, and all excess material will be used locally to form pond bunds and surrounding landscaping.		

MM53	Leakages and Spillages	EIAR Chapter 4, 8 Appendix 4-4 Appendix 4-5	› Refuelling and maintenance of construction vehicles and plant will, where practicable, be undertaken off-site at controlled, designated fuelling facilities. Where refuelling or maintenance is required on-site, it will be undertaken at designated areas in accordance with the Construction Environmental Management Plan (CEMP) and appropriate pollution prevention procedures; › On-site re-fuelling will be undertaken using a double skinned bowser or a refuelling truck with spill kits kept onboard; › Only designated trained operatives will be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; › Fuel and oil stores including tanks and drums will be regularly inspected by the appointed EnvCoW for leaks and signs of damage; › The Proposed Onsite Substation and the Proposed Offsite Substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, › An emergency response plan for the construction phase to deal with accidental spillages is contained within Section 6.14 of this CEMP.		
MM54	Erosion of Exposed Subsoils and Peat	Chapter 8 Appendix 4-3	› All works will be completed in accordance with the Peat and Spoil Management Plan (FTC, 2026); › All excavated peat and spoil will be transported immediately on excavation to designated peat and spoil areas along the access roads and will be used on site for landscaping close to the extraction area;		

			› Peat and spoil will not be transported further than the minimum distance required to facilitate their appropriate placement within the designated peat and spoil areas, in accordance with the Peat and Spoil Management Plan (FTC, 2026b); › Upon excavation, the upper vegetative layer (where still present) will be stored with the vegetation part of the sod facing the right way up to keep the plants and vegetation alive to aid construction reinstatement of disturbed ground; and › Re-seeding and spreading/planting will also be carried out in areas where ground will be disturbed.		
MM55	Peat Instability and Failure	EIAR Chapter 8 Appendix 8-1	The following general control measures incorporated into the construction phase of the Proposed Project will assist in the management of the risks: › Appointment of experienced and competent contractors; › Works will be supervised by experienced and qualified personnel; › Allocate sufficient time for the construction of the Proposed Project (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); › Prevent undercutting of slopes and unsupported excavations; › Maintain a manage a robust drainage system; › Prevent placement of loads/overburden on marginal ground; › Set up, maintain and report findings from monitoring systems (as outlined in the GPSRA); › Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and, › Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.		
MM56	Proposed Onsite Substation and	EIAR Chapter 8	› Mitigation measures in respect of peat and subsoil excavation are detailed in Line-Item MM52 above		

	Proposed Offsite Substation		› Mitigation measures to prevent soil / subsoil contamination (leaks / spills) are dealt with in in Line-Item MM53 above; and, › Mitigation measures dealing with soil erosion are dealt with in Line-Item MM54 above No additional specific mitigation measures are required.		
MM57	Proposed Amenity Track	EIAR Chapter 4, 8	› Mitigation measures in respect of peat and subsoil excavation are detailed in Line-Item MM52 above › Mitigation measures to prevent soil / subsoil contamination (leaks / spills) are dealt with in in Line-Item MM53 above; and, › Mitigation measures dealing with soil erosion are dealt with in in Line-Item MM54 above No additional specific mitigation measures are required.		
MM58	Proposed Turbine Delivery Route Accommodation Works	EIAR Chapter 15, 8	› Mitigation measures in respect of peat and subsoil excavation are detailed in Line-Item MM52 above › Mitigation measures to prevent soil / subsoil contamination (leaks / spills) are dealt with in in Line-Item MM53 above; and, › Mitigation measures dealing with soil erosion are dealt with in in Line-Item MM54 above		
MM59	Proposed Enhancement Areas	EIAR Chapter 6, 8 Appendix 6-5	› Mitigation measures in respect of peat and subsoil excavation are detailed in Line-Item MM52 above › Mitigation measures to prevent soil / subsoil contamination (leaks / spills) are dealt with in in Line-Item MM53 above; and › Mitigation measures dealing with soil erosion are dealt with in in Line-Item MM54 above		
MM60	Proposed Grid Connection OHL Loop in Connection	EIAR Chapter 8	› Mitigation measures in respect of peat and subsoil excavation are detailed in Line Item MM52 above › Mitigation measures to prevent soil / subsoil contamination (leaks / spills) are dealt with in in Line Item MM53 above; and, › Mitigation measures dealing with soil erosion are dealt with in in Line Item MM54 above No additional specific mitigation measures are required.		

EIAR Chapter 9 Water					
Pre-Construction Phase					
MM61	Temporary Drainage Works	EIAR Chapter 4, 9 Appendix 4-4	› All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. › All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
Construction Phase					
MM62	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	EIAR Chapter 4, 9 Appendix 4-3 Appendix 4-4 Appendix 4-5	**Proposed Mitigation by Avoidance** The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to main drains). The majority of the Proposed Project development areas are located away from the delineated 50m watercourse buffer zones with the exception of the upgrading of the existing watercourse crossing, new drain crossing and upgrades to existing site access tracks and the small hydrological feature to the southwest of the Proposed Offsite Substation. Works within the hydrological buffer zones comprise of new and proposed watercourse crossings, sections of access roads to the south of T37 (930m of access road) and in the south of Lodge Bog (130m access road) and crane hardstands associated with T36 and T38. Additional mitigation measures are prescribed for these areas. The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures to be properly installed and operate effectively. The proposed buffer zone will: › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment;		

			› Avoid excavations within close proximity to surface watercourses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. In addition, and as outlined above, the drainage systems for the Proposed Wind Farm and Proposed Onsite Substation will connect into the existing bog drainage network. Runoff will be conveyed through the existing field drains and main drains to the existing large IPC licenced settlement ponds, where it will undergo further settlement and attenuation prior to discharge from the bog. The nearest IPC licenced settlement pond is located ~160m from the nearest turbine. As such, there is significant distance for wind farm related surface water to travel before it actually reaches the edge of the bogs and joins any receiving waters outside of the overall bog boundaries. **Proposed Mitigation by Design** There is an extensive network of drains already existing at the Proposed Wind Farm site. The existing drainage infrastructure is operating in accordance with IPC licence requirements, with environmental monitoring and silt control measures being implemented. The existing drainage system at the bogs will be maintained and expanded locally as required for use within the Proposed Project drainage system. The key elements are the upgrading and improvements to water treatment elements, such as in-line controls and treatment systems, including wind farm related silt traps and settlement ponds. The elements of interaction with existing drains will be as follows: › Interceptor drains will convey clean runoff water around works areas to the existing downstream drainage system (field drains and main drains). Where required, interceptor drains will be installed in advance of any construction works commencing. This will ensure that clean water is kept clear by diverting surface water flow around excavations, construction areas and temporary storage areas. Where possible (depending on orientation), existing field drains can be used as interceptors drains;		

			› Collector drains will be used to intercept and collect runoff from construction areas (from turbine base/hardstand areas, construction compounds, and the substation). During the construction phase temporary settlement ponds will be used to attenuate and treat runoff from the construction areas (from turbine base/hardstand areas, construction compounds, and the Proposed Onsite Substation) and treated water will then discharge into existing field drains and main drains. Temporary settlement ponds will be removed at the end of the construction phase (end of high-risk period), and operating wind farm runoff will discharge into existing field drains and main drains; › During the construction phase, temporary silt traps (silt fences) will be used as an additional water protection measure around the existing bog drainage network, particularly where works are proposed within 50m of a natural watercourse. The silt fences will be placed in the existing drains downstream of construction works, and the associated construction area run-off water will be diverted into proposed interceptor drains, or culverted under/across the works area; › During the construction phase, dewatering silt bags will also be used as required. They can be used downgradient of Proposed Turbine bases, where temporary pumping is required. Discharge from dewatering silt bags will flow into settlement ponds and treated water from settlement ponds will outfall to existing field drains and main drains; › With regards to the proposed floating roads, and depending on intermediate topography, a collector drain (dirty water system as described above) may be used during construction stage, or over the edge (OTE) drainage will occur. OTE drainage allows runoff from access tracks to flow into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, and it is only proposed in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations. Silt traps and check dams will be installed in field drains downstream of OTE drainage areas, and these will provide attenuation and treatment of dirty water; and, › Culverts will be required where site roads and proposed hardstands cross the main bog drainage networks. These will be installed with a minimum gradient to reduce the entrainment of suspended solids. All culverts will be inspected regularly and maintained where appropriate. Culverts will remain in-situ during the operational phase of the Proposed Project.		

			Water Treatment Drain: If the discharge water from construction areas fails to be of a high quality, then a filtration treatment system (such as a 'Siltbuster®' or similar equivalent treatment train (sequence of water treatment processes)) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the existing drainage network of sand and gravel-sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin and entrained in surface water runoff. Regular inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. **Silt Bags:** Silt bags will be used where small to medium volumes of water need to be pumped from excavations (e.g. the proposed underpass locations). As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. **Pre-emptive Site Drainage Management:** The works programme for the construction stage of the development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of peat/subsoil or peat stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily/weekly basis, as required, to allow site staff to direct proposed and planned construction activities:		

			› General Forecasts: Available on a national, regional and county level from the Met Éireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; › Rainfall Radar Images: Images covering the entire country are freely available from the Met Éireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow planned works to be safely executed (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Earthworks will be suspended if forecasting suggests any of the following is likely to occur: › >10 mm/hr (i.e. high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. Prior to earthworks being suspended the following control measures will be completed: › Secure all open peat/spoil excavations; › Provide temporary or emergency drainage to prevent back-up of surface runoff; and,		

			› Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. **Management of Runoff from Peat and Spoil Areas:** All excavated peat and overburden will be placed/spread alongside the excavations for the infrastructure elements. Excavated peat and spoil will be transported immediately on excavation to designated peat and spoil areas alongside the hardstands and access roads or used for landscaping. During the initial placement of peat and spoil, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from the storage areas as required. Interceptor and collector drains will be used at storage areas. 'Siltbuster' or similar equivalent treatment trains will be employed if previous treatment is not to a high quality. **Timing of Site Construction Works:** Construction of the onsite drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works. **Proposed Drainage and Water Quality Monitoring** An inspection and maintenance plan for the onsite drainage system will be prepared in advance of commencement of any works and will be included in the CEMP (Construction and Environmental Management Plan) (Appendix 4-4). Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Any excess build-up of silt levels at dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature will be removed.		

			During the construction phase field testing (visual, supplemented with pH, electrical conductivity, temperature, dissolved oxygen and turbidity monitoring), sampling and laboratory analysis of a range of parameters[10] with relevant regulatory limits and EQSs will be undertaken for each primary watercourse, and specifically following heavy rainfall events (i.e. weekly, monthly and event-based). The data will be processed and analysed, and works will cease if elevated turbidity concentrations are recorded. In this event, all upstream silt traps and drainage routes will be inspected to identify the cause of the elevated turbidity levels. Works will not recommence until any issues have been resolved and the turbidity concentrations have returned to background concentrations. **Works within Buffer Zones** The following additional mitigation measures will also be implemented: › Double or triple silt fences will be placed downgradient of all work locations within the hydrological buffer zones; › All works will be completed during the dry weather periods and works will be postponed in the event of rainfall; and, › The hedgerow separating the small hydrological feature to the southwest of the Proposed Offsite Substation will be retained. This feature is not shown on the EPA databases but was recorded during site surveys. The features was described as being heavily vegetated and with a low flow. Retaining the hedgerow will acts as an additional protection measure to this features.		
MM63	Surface Water Quality from Excavation Dewatering	EIAR Chapter 9	Management of excavation seepages and subsequent treatment prior to discharge into the drainage network will be undertaken for excavation works across the Project Site, as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place;		

[10] example suite: pH (field measured), Electrical Conductivity (field measured), temperature (field measured), Dissolved Oxygen (field measured), Turbidity (NTU) (sonde measured), Flow (m/s), Total Suspended Solids (mg/L), Ammonia, Nitrite (NO_2) (mg/L), Ortho-Phosphate (P) (mg/L), Nitrate (NO_3) (mg/L), Phosphorus (unfiltered) (mg/L), Chloride (mg/L), and BOD (mg/L).

			› If required, pumping of excavation inflows will prevent the build-up of groundwater in the excavation; › The interceptor drainage will be discharged to the existing drainage system or onto natural vegetated surfaces within the Project Site and not directly to any natural watercourse; › The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a "Siltbuster®" unit; › There will be no direct discharge to the existing drainage network and therefore no risk of hydraulic loading or contamination will occur; and, › Daily monitoring of excavations and the water treatment system by a suitably qualified person (EnvCoW) will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped, and a geotechnical assessment will be undertaken. Proven and effective measures to minimise the levels of sediment from the Project Site have been proposed above and will maximise the drainage pathway length between the potential sources and the receptor.		
MM64	Leakages or Spillages of Hydrocarbons	EIAR Chapter 9	› Refuelling and maintenance of construction vehicles and plant will, where practicable, be undertaken off-site at controlled, designated fuelling facilities. Where refuelling or maintenance is required on-site, it will be undertaken at designated areas in accordance with the CEMP and appropriate pollution prevention procedures; › On-site re-fuelling will be undertaken using a double skinned bowser or a refuelling truck with spill kits kept onboard; › Only designated trained operatives will be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;		

			› Fuel and oil stores including tanks and drums will be regularly inspected by the appointed EnvCoW for leaks and signs of damage; › The Proposed Onsite Substation and the Proposed Offsite Substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within Section 6.1.4 of this CEMP. Spill kits will be available to deal with accidental spillages		
MM65	Release of Cement Based Products	EIAR Chapter 4, 9 Appendix 4-4	› No batching of wet-cement products will occur on-site. Ready-mixed concrete will be delivered to site, and where possible, pre-cast elements will be used; › Where possible pre-cast elements for culverts and concrete works will be used; › No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on-site, only the chute will be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be isolated in temporary lined wash-out pits located near proposed site compounds. These temporary lined wash-out pits will be removed from the site at the end of the construction phase; › Any washing out of concrete pumping plant will also be into the temporary lined wash-out pits; › The appointed contractor will ensure to use weather forecasting to plan dry days for pouring concrete; and, › The appointed contractor will ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.		

MM66	Wastewater Disposal	EIAR Chapter 9	› There are a total of 10 no. proposed construction compounds associated with the Proposed Project (the locations of the compounds are detailed in Table 4-2 of Chapter 4); › During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works; › Water supply for the site office and other sanitation will be brought to the Project Site and removed after use from the site to be discharged at a suitable off-site treatment location; › No water or wastewater will be sourced on the Project Site, nor discharged to the Project Site.		
MM67	Piled Foundations	EIAR Chapter 9	The proposed mitigation measures designed for the protection of downstream surface water quality and groundwater quality within the Proposed Wind Farm will be implemented at all construction work areas. › Mitigation measures for sediment control are detailed in Line-Item MM62 above. › Mitigation measures for the control of hydrocarbons during construction works are detailed in Line-Item MM64 above. › Mitigation measures for the control of cement-based products during construction works are detailed in Line-Item MM65 above. › Mitigation measures in relation to wastewater are detailed in Line-Item MM66 above. Proposed mitigation measures relative to piling works will comprise: › Where driven piles are used, they will have a cross section without re-entrant angles; › Strict QA/QC procedures for piling works will be followed; › Piles will be kept vertical during piling works; › Where required a bentonite seal to prevent upward/downward movement of surface water/groundwater.		
MM68	Morphological Changes to	EIAR Chapter 9	› Clear-span bridge crossings will be designed to span the watercourse without disturbance to the watercourse bed and with abutments located outside the channel where practicable.		

	Watercourses at the Proposed Wind Farm		› Where bottomless culverts are proposed, the natural watercourse bed will be retained through the crossing where practicable. Construction will be undertaken from outside the watercourse channel and appropriate measures will be implemented to prevent the mobilisation of sediment into the watercourse; › Where box culverts or pipes are proposed, the crossing will be suitably sized for the expected peak flows and designed to maintain hydraulic conveyance. Any works required within or immediately adjacent to the watercourse will be undertaken in accordance with the relevant OPW and IFI requirements and appropriate sediment and pollution control measures will be implemented; › Existing crossings requiring upgrading or replacement will be constructed in a manner that minimises disturbance to the existing watercourse and its banks. Where existing structures are to be removed, works will be undertaken in accordance with the approved construction methodology and appropriate measures will be implemented to prevent sediment mobilisation; › All proposed new and upgraded crossings will be designed to maintain existing watercourse flow conveyance and to avoid creating a restriction to flow or increasing flood risk upstream or downstream of the crossing; › All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI)11 is incorporated into the design of the proposed crossings; › All drainage measures will be installed in advance of the works; › Plant and equipment will not be permitted to track across the watercourse. Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge; › As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "Guidelines on protection of fisheries during construction works in and adjacent to waters", i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);		

[11] *Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*

			› Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase; › All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent; › Existing crossings requiring upgrading or replacement will be constructed in a manner that minimises disturbance to the existing watercourse and its banks. Where existing structures are to be removed, works will be undertaken in accordance with the approved construction methodology and appropriate measures will be implemented to prevent sediment mobilisation; and, › All proposed new and upgraded crossings will be designed to maintain existing watercourse flow conveyance and to avoid creating a restriction to flow or increasing flood risk upstream or downstream of the crossing.		
MM69	Morphological Changes to Watercourses along the Proposed Grid Connection	EIAR Chapter 9	Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed: › A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside the watercourse 50m buffer zone; › The following mitigation measures are proposed for the Proposed Grid Connection crossing works: ○ No stockpiling of construction materials will take place along the grid route; ○ No refuelling of machinery or overnight parking of machinery is permitted in this area; ○ No concrete truck chute cleaning is permitted in this area; ○ Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; ○ Local road drainage, culverts and manholes will be temporarily blocked during the works; ○ Machinery deliveries will be arranged using existing structures along the public road;		

			○ All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur; ○ Any excess construction material will be immediately removed from the area and sent to a licenced waste facility; ○ Spill kits will be available in each item of plant required to complete the works; and, ○ Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. › Mitigation measures for HDD are detailed Line-item MM70.		
MM70	Horizontal Directional Drilling along the Proposed Grid Connection Underground Cabling Route	EIAR Chapter 9	› Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions; › The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance; › There will be no storage of material / equipment or overnight parking of machinery inside the hydrological buffer zone; › Before any ground works are undertaken, double silt fencing will be placed upslope of the Grand Canal; › Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions / channels that slope towards the watercourse; › Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered; › The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages and prevent the migration of drilling fluids from the works area; › Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; › Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before being taken off-site;		

			▸ If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works); ▸ This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed settlement pond area at least 50m from the Grand Canal; ▸ The discharge of water onto vegetated ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing; ▸ Any sediment laden water from the works area will not be discharged directly to the Grand Canal or drain; ▸ Works will not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted; ▸ Daily monitoring of the compound works area; the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the Grand Canal; ▸ If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; ▸ On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion; ▸ The silt fencing upslope of the Grand Canal will be left in place and maintained until the disturbed ground has re-vegetated; ▸ There will be no batching of cement along the Proposed Grid Connection underground electrical cabling route; ▸ There will be no refuelling allowed within 100m of the Grand Canal crossing; and, ▸ All plant will be checked for purpose of use prior to mobilisation at the canal crossing. Fracture Blow-out (Frac-out) Prevention and Contingency Plan:		

			› The drilling fluid will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used); › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage; › One or more lines of silt fencing will be placed between the works area and the adjacent river; › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; › Adequately sized skips will be used where temporary storage of arisings are required; › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur, then drilling will be immediately stopped; › Any frac-out material will be contained and removed off-site; › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.		
MM71	Use Of Siltbuster	EIAR Chapter 9	Measures employed to prevent overdosing and potential chemical carryover: › The Siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, and this minimises the risk of overdosing; › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated, suitably qualified staff, means the correct amount of chemical is added by the dosing system; › Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; › Final effluent not meeting the discharge criteria will be recycled and retreated, which has a secondary positive effect of reducing carryover; and, › The use of biodegradable chemical agents will be implemented at very sensitive sites (i.e. adjacent to SACs).		

			With the implementation of the dosing technology and the continual monitoring of pre and post treatment water, the appropriate volume of chemical agent can be added to ensure that chemical carryover concentrations are present only in tiny trace amounts which will not cause any effects to receiving waters or associated aquatic ecology.		
MM72	Hydrologically Connected Designated Sites	EIAR Chapter 9	Mitigation measures in relation to the protection of surface water drainage regimes and surface water quality within the Project Site detailed in the preceding sections as follows: › Mitigation measures for suspended solids are detailed in Line-Items MM62 and MM63 above. › Mitigation measures for the control of hydrocarbons during construction works are detailed in Line-Item MM64 above. › Mitigation measures for the control of cement-based products during construction works are detailed in Line-Item MM65 above. › Mitigation measures in relation to wastewater are detailed in Line-Item MM66 above.		
MM73	Groundwater Abstractions (Public and Private)	EIAR Chapter 9	› Mitigation measures for the control of hydrocarbons during construction works are detailed in Line-Item MM64 above. › Mitigation measures for the control of cement-based products during construction works are detailed in Line-Item MM65 above. › Mitigation measures in relation to wastewater are detailed in Line-Item MM66 above. › Mitigation measures in relation to piling works are detailed in Line-Item MM67 above.		
MM74	Surface Water Drinking Supplies	EIAR Chapter 9	› Mitigation measures for sediment control are detailed in Line-Items MM62 and MM63 above. › Mitigation measures for the control of hydrocarbons during construction works are detailed in Line-Item MM64 above. › Mitigation measures for the control of cement-based products during construction works are detailed in Line-Item MM65 above.		

MM75	WFD Status and Objectives	EIAR Chapter 9 Appendix 9-4	› Mitigation measures for sediment control are detailed in Line-Items MM62 and MM63 above. › Mitigation measures for the control of hydrocarbons during construction works are detailed in Line-Item MM64 above. › Mitigation measures for the control of cement-based products during construction works are detailed in Line-Item MM65 above. › Mitigation measures in relation to wastewater are detailed in Line-Item MM66 above. Mitigation measures in relation to piling works are detailed in Line-Item MM67 above.		
MM76	Biodiversity Management Plan	EIAR Chapter 9 Appendix 6-5	Slow-release fertilisers will be used to reduce nutrient losses through leaching and surface runoff by releasing nutrients gradually in line with vegetation requirements. There will be no application of fertilizers within the hydrological buffer zones.		
MM77	Amenity Track	EIAR Chapter 9	Detailed mitigation measures for sediment control are outlined in Line-Items MM62 and MM63 above and detailed mitigation measures for control of hydrocarbons during construction works are outlined in Line-Item MM864 above.		
MM78	Proposed Turbine Delivery Route Accommodation Works	EIAR Chapter 9, 15	**Mitigation by Avoidance:** A constraint/buffer zone will be maintained for all upgrade works locations where possible. In addition, measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse. The purpose of the constraint zone is to: › Avoid physical damage to surface water channels; › Provide a buffer against hydraulic loading by additional surface water run-off;		

			› Avoid the entry of suspended sediment and associated nutrients into surface waters from excavation and earthworks; › Provide a buffer against direct pollution of surface waters by pollutants such as hydrocarbons; and, › Provide a buffer against construction plant and materials entering any watercourse. General Best Practice Pollution Prevention Measures will also include: › No stock-piling of construction materials will take place within the constraints zone. No refuelling of machinery or overnight parking of machinery is permitted in this area; › No concrete truck chute cleaning is permitted in this area; › Works shall not take place at periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast; › Plant will travel slowly across bare ground at a maximum of 5km/hr. › Machinery deliveries shall be arranged using existing structures along the public road; › All machinery operations shall take place away from the stream and ditch banks, although no instream works are proposed or will occur; › Any excess construction material shall be immediately removed from the area and taken to a licensed waste facility or the on-site spoil management areas; › No stockpiling of materials will be permitted in the constraint zones; › Spill kits shall be available in each item of plant required; and, › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. Mitigation Measures relating to the use and storage of fuels and chemicals in terms of groundwater protection: › No maintenance of construction vehicles or plant will take place along the temporary junction works areas; › The plant used will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillage.		

MM79	Clear-Felled Forestry and Vegetation Removal	EIAR Chapter 9	Mitigation by Avoidance There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures to be properly installed and operate effectively. The buffer/setback zone will: › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; › Avoid soil disturbance and compaction within close proximity to surface watercourses; › Avoid the entry of suspended sediment from works into watercourses; and, › Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during felling works: Mitigation by Design: Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release into surface watercourses comprise best practice methods which are set out as follows: › Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; › All machinery will be operated by suitably qualified personnel; › Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road		

			infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; › Machines will traverse the Project Site along specified off-road routes (referred to as racks); › The location of racks will be chosen to avoid wet and potentially sensitive areas; › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when mats become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat and spoil areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on Site during construction; › Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; › Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; › Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites; › Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; › Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,		

			› Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. **Silt Traps**: Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner. **Timing of Proposed Project Felling Works:** Felling will only be carried out during periods of no or low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. **Drain Inspection and Maintenance**: The following items will be carried out during pre-felling inspections and after: › Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions; › Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall; › Following tree felling all main drains will be inspected to ensure that they are functioning; › Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the Site, if impeded by silt or debris, will be unblocked; and, › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.		

			Surface Water Quality Monitoring: Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown). Criteria for the selection of water sampling points include the following: › Avoid man-made ditches and drains, or watercourses that do not have year-round flows, i.e. avoid ephemeral ditches, drains or watercourses; › Select sampling points upstream and downstream of the forestry activities; › It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; › Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, › The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near a watercourse (to be completed by the EnvCoW). These will be kept on site for record and inspection.		
EIAR Chapter 10 Air Quality					
Construction Phase					

MM80	Exhaust Emissions	EIAR Chapter 10 Appendix 4-4	› All construction vehicles and plant used during construction will be maintained in good operational order while onsite. If any vehicle requires repair, this work will be carried out, thereby minimising any emissions that arise. › Turbines components and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. › All machinery will be switched off when not in use. › Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › Aggregate materials for the construction of the internal access road network and all associated infrastructure will all be locally sourced where possible, which will further reduce potential emissions. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Project Site. Therefore, all waste streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF will be local to the Project Site to reduce the amount of exhaust emissions associated with vehicle movements. ○ Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the nearest Proposed Turbine (T32). ○ Drehid Landfill, located approximately 6.5km northeast of the nearest Proposed Turbine (T30). ○ Chem Regen, located approximately 25.5km southwest of the nearest Proposed Turbine (T14). ○ Cleary Compost & Shredding Ltd. located approximately 24.9km south of the nearest Proposed Turbine (T14). ○ Soltec (Ireland) Ltd, located approximately 31.5km northwest of the nearest Proposed Turbine (T32). ○ Allied Recycling, located approximately 9.2km south of the Proposed Offsite Substation.		

			› A CEMP will be in place throughout the construction. The CEMP includes measures to reduce exhaust emissions. › Temporary Construction Compounds are spread out throughout the Project Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further exhaust emissions.		
MM81	Dust Emissions	EIAR Chapter 10 Appendix 4-4	› A wheel wash facility will be installed at all proposed construction site entrances and will be used by vehicles before leaving the Project Site. › Dust suppression measures, including water spraying of exposed surfaces and trafficked areas, will be implemented as required during dry weather conditions. In periods of extended dry weather, dust suppression will be necessary along Proposed Construction Haul Routes, site roads, grid route, road widening sections, substation, and construction compounds to ensure dust does not cause a nuisance. ○ If necessary, such as during periods of dry weather, de-silted water will be taken from stilling ponds via the existing drainage system within the Allen Bog Group, which encompasses part of the Proposed Project, and will be pumped into a bowser or water spreader to dampen down internal access roads, turbine bases and site compounds to prevent the generation of dust where required. ○ Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff as outlined in the CEMP. › Turbines components, construction materials and grid connection infrastructure will be transported to the Project Site via Proposed Construction Haul Routes, as agreed with the local authority. ○ The Proposed Construction Haul Routes adjacent to the Project Site will be regularly inspected for cleanliness and cleaned as deemed necessary by the construction Site Supervisor/Site Manager. › Waste material will be transferred to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. ○ The MRF facility will be local to the site to reduce dust emissions associated with vehicle movements. The nearest licensed waste facility located are: ○ Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the nearest Proposed Turbine (T32).		

			○ Drehid Landfill, located approximately 6.5 km northeast of the nearest Proposed Turbine (T30). ○ Chem Regen, located approximately 25.5 km southwest of the nearest Proposed Turbine (T14). ○ Cleary Compost & Shredding Ltd. located approximately 24.9 km south of the nearest Proposed Turbine (T14). ○ Soltec (Ireland) Ltd, located approximately 31.5 km northwest of the nearest Proposed Turbine (T32). ○ Allied Recycling, located approximately 9.2km south of the Proposed Offsite Substation. › A CEMP will be in place throughout the construction phase. The CEMP includes dust suppression measures. › Temporary Construction Compounds are spread out throughout the Project Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further dust emissions. › All HGVs transporting construction materials to and from the Project Site will be covered with suitably secured tarpaulin sheeting to prevent dust emission during transit along Proposed Construction Haul Routes. › Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Project Site, particularly during extended dry periods › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › The ECoW will perform daily visual site inspections of dust occurrence within the Project Site during construction, particularly during periods of dry weather and windy conditions. This will be noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site. ○ The ECoW will have power to halt construction works if required. ○ The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m2/day (for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Project Site. Where dust levels are measured to be above this, mitigation measures will be reviewed		

EIAR Chapter 11 Climate					
Construction Phase					
MM82	Greenhouse Gas Emissions	EIAR Chapter 11	› Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Turbines and construction materials will be transported to the Project Site along the Proposed Construction Haul Routes and Proposed Turbine Delivery Route only unless otherwise agreed with the Planning Authority. Please see Section 15.1.10 of Chapter 15 Material Assets for details. › Aggregate materials for the construction of the internal access road network and all associated infrastructure will all be locally sourced where possible, which will further reduce potential emissions. › A CEMP (Appendix 4-4) will be in place throughout the construction phase. › The CEMP (Appendix 4-4) includes a Resource Waste Management Plan (RWMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. ○ The RWMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. ○ Section 4.6.9 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted MRF by a fully licensed waste contractor. ○ The MRF facility will be local to the Project Site to reduce the number of emissions associated with vehicle movements.		

			• Edenderry Recycling Centre is the closest waste facility to the Project Site and is approximately 3.5km north of the Proposed Turbine (T32). • Drehid Landfill located approximately 6.5km northeast of the Proposed Turbine (T30). • Chem Regen located approximately 25.5km southwest of the Proposed Turbine (T14). • Cleary Compost & Shredding Ltd. located approximately 24.9km south of the Proposed Turbine (T14). • Soltec (Ireland) Ltd, located approximately 31.5km northwest of the Proposed Turbine (T32). • Allied Recycling located approximately 9.2 km southeast of the Proposed Offsite Substation. › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
EIAR Chapter 12 Noise					
Construction Phase					
MM83	Noise Control	EIAR Chapter 12 Appendix 4-4	The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the Project Site. 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'* The assessment of potential impacts presented in Section 12.6.2 of Chapter 12 of the EIAR has demonstrated that the Proposed Project is expected to comply with the noise and vibration		

			criteria during the construction phase and therefore no specific mitigation measures are required. 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 and BS 5228-2:2009+A1:2014. 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.		
EIAR Chapter 13 Landscape and Visual					
Construction Phase					
MM84	Visual Effects	EIAR Chapter 13 Appendix 4-4	All construction activities will follow best practice methods to reduce impacts upon the environment and landscape of the Proposed Project. Further details are presented in the *Construction and Environmental Management Plan* (CEMP) contained in *Appendix 4-4* of this EIAR. The following mitigation measures and existing mitigating factors have been taken into account in determining the residual construction-phase visual effects: › General housekeeping measures, necessary for Health and Safety requirements, will ensure that the active construction areas will be kept tidy, further mitigating localised visual impacts during the construction phase. › Many residential receptors, as well as the roads themselves, are surrounded by treelines and hedgerows that will provide visual screening towards the proposed substations.		
MM85	Landscape Effects	EIAR Chapter 13 Appendix 4-4	All construction activities will follow best practice methods to reduce impacts upon the environment and landscape of the Proposed Project. Further details are presented in the *Construction and Environmental Management Plan* (CEMP) contained in *Appendix 4-4* of this EIAR. The following measures will be implemented to mitigate landscape effects during the construction phase of the Proposed Project:		

			› In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. Any areas of bare soil remaining after the landscaping phase will be seeded as soon as possible with a grass-seed mix to minimise sediment run-off.		
EIAR Chapter 14 Cultural Heritage					
Pre-Construction/ Construction Phase					
MM86	Recorded Monuments (Direct Effects)	EIAR Chapter 14	› Archaeological monitoring of ground works associated with the proposed new amenity track extending from T46 interacts with the location of recorded monument KD012-002001- will be undertaken. Archaeological monitoring of any ground works proposed within the Proposed Enhancement Areas within Lodge Bog in the immediate vicinity of the recorded location of recorded monuments KD012-019— Platform – peatland and KD012-018— Structure – peatland and within a c. 20m radius of same. The monitoring will be carried out under licence from the National Monuments Service (NMS). A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority/Body. Should archaeological finds, features or deposits be uncovered during the monitoring further mitigation such as preservation in situ or preservation by record (excavation) may be required and will be carried out in consultation with the NMS. › Archaeological monitoring of ground works associated with the Proposed Grid Connection where it extends through the ZoN for KD013-017— Ringfort – rath will be undertaken. The monitoring will be carried out under licence from the National Monuments Service (NMS). A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority/Body. Should archaeological finds, features or deposits be uncovered during the monitoring further mitigation such as preservation in situ or preservation by record (excavation) may be required and will be carried out in consultation with the NMS.		
MM87	Sub-Surface Archaeological Potential	EIAR Chapter 14	› Archaeological monitoring under licence from the NMS of any further geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.		

			› Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. Peat depth data and local ground conditions may dictate the number and location of test trenches to be excavated. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented, where relevant, following consultation with the NMS. › Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS will be carried out by a suitably qualified archaeologist. Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.		
EIAR Chapter 15 Material Assets					
Material Assets - Traffic					
Construction Phase					
MM88	Traffic Management of Large Deliveries	Chapter 15	The following are the main points to note for these deliveries which will take place after peak evening traffic:		

			› The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. › The deliveries will be made in consultation with the Local Authority and An Garda Síochána. › These nights will be spread out over an approximate period of 25 weeks and will be agreed in advance with the relevant authorities, › In order to manage each of the travelling convoys, for each there will be two Garda escort vehicles that will stop traffic when required at the front and rear of the convoy of 3 vehicles. › There will also be two escort vehicles provided by the haulage company for each convoy.		
MM89	Other Traffic Management Measures	EIAR Chapter 15 Appendix 15-2 Appendix 4-4	A detailed TMP (Appendix 15-2) will be provided specifying details relating to traffic management and included in the CEMP (Appendix 4-4) prior to the commencement of the construction phase of the Proposed Project. The TMP will be agreed with the local authority and An Garda Síochána prior to construction works commencing onsite. The detailed TMP will include the following: › **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator will be appointed for the duration of the development, and this person will be the main point of contact for all matters relating to traffic management. Based on the scale of the Proposed Project it is envisaged that more than one person will be required for this role. › **Delivery Programme** – a programme of deliveries will be submitted to Kildare and Offaly County Councils in advance of deliveries of turbine components to the Proposed Wind Farm. Liaison with the relevant local authorities, TII and MMaRC will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the Project Site. › **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. the delivery of turbine components at night via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who		

			will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number for the Traffic Management Co-Ordinator will also be provided. › **A Pre and Post Construction Condition Survey** – Where required by Kildare and Offaly County Councils Road Sections, a pre-condition survey of roads associated with the Proposed Project will be carried out immediately prior to construction commencement to record an accurate condition of the road network at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. The timing of these surveys will be agreed with the local authorities. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. › **Liaison with the relevant local authority** - Liaison with Kildare and Offaly County Councils and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Road Sections of Kildare and Offaly County Council will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager. › Implementation of temporary alterations to road network at critical junctions – at locations highlighted in Section 15.1.6.1 in Chapter 15. › **Identification of delivery routes** – The optimal delivery routes for general construction traffic have been identified as part of the detailed link capacity assessment set out in Section 15.1.6.1 and are adopted for the traffic impact assessment presented in this EIAR. Prior to construction these routes will be agreed with Kildare and Offaly County Councils and adhered to by all contractors. › **Time restriction and locations** on routes - Construction traffic on the R402 through Edenderry will avoid the two peak hours between 08:00 – 09:00 and 17:00 – 18:00. Construction traffic on the R415 through Kilmeage will avoid the PM peak hour of 17:00 – 18:00. Grid construction on the R402 / R414 and L6002 should avoid school term time. › **Delivery times of large turbine components** – The large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.		

			› **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at Access Junctions 5 on the R414 to facilitate the crossing of general construction traffic between Site Entrances I and J. All measures will be in accordance with the *"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"* (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S). Construction staff (flagman) will be present at this location during peak delivery times. › Implementation of Stop & Go traffic management, and/or implementation of temporary diversion routes (Precautionary Option) during the construction of the Proposed Grid Connection underground electrical cabling route – As set out in Section 15.1.6.4.1 of this EIAR, in accordance with *"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"* (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S). › Consultation with residents / business owners on Proposed Grid Connection underground electrical cabling route – To ensure access maybe retained at all times. › **Travel plan for construction workers –** While the assessment above has assumed the precautionary scenario in that construction workers will drive to the Project Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the Site and identification of area for parking on site. › **Wheel washing / Road cleaning measures** – These additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network. › **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
Material Assets - Other					
Pre-Construction/Construction Phase					

MM90	Electricity	EIAR Chapter 4, 5, 15 Appendix 4-4	› Goal posts will be established under the overhead line for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks ○ Prior to construction, the Applicant will engage with ESB via the 'Dial Before You Dig' procedure online. ESB will be contacted via dig@esb.ie **before** excavating near any overhead lines. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running the site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites will be made aware of the location of lines before they come on to site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g. component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment will take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site. › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan. › All health and safety measures as detailed in the Construction Environment Management Plan and Chapter 5 Population and Human Health of the EIAR will be adhered to during the construction, operation and decommissioning phases.		

MM91	Water	EIAR Chapter 9, 15	› Prior to construction, the Applicant will engage with Uisce Éireann in advance of finalising the detailed design in the vicinity of the identified watermain. The Applicant will identify the presence and likely alignment of the watermain through desk-based review of available Uisce Éireann network mapping, supplemented by site investigation. Where the watermain is confirmed to be located within or adjacent to the Proposed Grid Connection underground electrical cabling route, a 'Building Over or Near an Uisce Éireann Asset' application will be submitted to Uisce Éireann in advance of works. All proposed works along the Proposed Grid Connection underground electrical cabling route in the vicinity of the watermain will be undertaken in accordance with Uisce Éireann's Standard Details and Codes of Practice , and the Health and Safety Authority's 'Code of Practice for Avoiding Danger from Underground Services'.		
MM92	Waterways	EIAR Chapter 15, 9, 12 Appendix 4-4	Chapter 9: Water identifies the mitigation measures identified to protect surface water quality at the HDD crossing of the Grand Canal: › Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions; › The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance; › There will be no storage of material / equipment or overnight parking of machinery inside the hydrological buffer zone; › Before any ground works are undertaken, double silt fencing will be placed upslope of the Grand Canal; › Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions / channels that slope towards the watercourse; › Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;		

			• The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages and prevent the migration of drilling fluids from the works area; • Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; • Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before being taken off-site; • If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works); • This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed settlement pond area at least 50m from the Grand Canal; • The discharge of water onto vegetated ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing; • Any sediment laden water from the works area will not be discharged directly to the Grand Canal or drain; • Works will not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted; • Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the Grand Canal; • If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; • On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion;		

			› The silt fencing upslope of the Grand Canal will be left in place and maintained until the disturbed ground has re-vegetated; › There will be no batching of cement along the Proposed Grid Connection underground electrical cabling route; › There will be no refuelling allowed within 100m of the Grand Canal crossing; and, › All plant will be checked for purpose of use prior to mobilisation at the canal crossing. Chapter 12: Noise and Vibration which identifies the noise and vibration construction phase mitigation measures. › 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'*. › The assessment of potential impacts presented in Section 12.6.2 has demonstrated that the Proposed Project is expected to comply with the noise and vibration criteria during the construction phase and therefore no specific mitigation measures are required. 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 and BS 5228-2:2009+A1:2014. 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. These are outlined in the CEMP that has been prepared for the Proposed Project included in Appendix 4-4.		

MM93	Waste Management	EIAR Chapter 15 Appendix 4-4	› All waste generated on site during the construction phase will be contained in waste skip at a waste storage area within the Project Site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the Project Site. Therefore, all waste streams generated on site will be deposited into a single waste skip. The waste material will be transferred to a MRF by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal. › Site personnel will be instructed at induction that under no circumstances can personal waste be brought on site for disposal in the onsite waste skip. It will also be made clear that the burning of waste material on site is forbidden. › Further details on waste management are presented in Section 3.8 of this CEMP.		
MM94	Gas	EIAR Chapter 15	Prior to construction, the Applicant will engage with GNI via the 'Dial Before You Dig' procedure online. GNI will be contacted on 1800 42 77 47 before excavating near the identified medium-pressure pipeline. Furthermore, the '*Safety advice for working in the vicinity of natural gas pipelines'* guidance document and the GNI '*Code of Practice*' standards will be adhered to during all proposed works along the Proposed Grid Connection in vicinity of the medium-pressure pipeline and the telecommunication lines.		

8. MONITORING PROPOSALS

All monitoring proposals relating to the pre-commencement and construction phases of the Proposed Project are set out in various sections of the EIAR, NIS and BMP prepared as part of the planning application to ACP.

This section of the CEMP groups together all of the monitoring proposals presented in the EIAR. The monitoring proposals are presented in the following pages. The monitoring proposals are also outlined within Chapter 19: Schedule of Mitigation and Monitoring Measures. Operational and Decommissioning Phase monitoring measures are not included in the table below, however, can be viewed in Chapter 19 of this EIAR and Appendix 4-7 (Decommissioning Plan).

By presenting the monitoring proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the Proposed Project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 8-1 Proposed Monitoring Measures

Ref No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Chapter 4, 9 Appendix 4-4	An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be carried out, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW. Please see Section 9.4.1 of Chapter 9 Water and Section 3.2 of the CEMP for further information.	On going	Monthly	ECoW
MX2	Invasive Species	EIAR Chapter 6 Appendix 4-4	A pre-commencement invasive species survey of the construction footprint will be undertaken by a qualified ecologist to determine if any invasive species have established on the site since the undertaking of the previous surveys. The treatment and control of invasive alien species if recorded will follow guidelines issued by the National Roads Authority – The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020).	Once	As required	Project Ecologist
MX3	Birds	EIAR Chapter 7 Appendix 7-7	› It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Works are defined as the clearing of woody vegetation, any building or engineering works. Pre-commencement surveys will be undertaken within one month prior to the initiation of works. The purpose of these surveys is to identify sensitive roosting sites. › If works run into the subsequent breeding season(s) (April-September), surveys will be conducted to identify sensitive nesting sites. Breeding season surveys will be conducted once per month from April to July inclusive when	Once	As required	Project Ornithologist

			works are taking place. If works run into the subsequent winter season(s) (October to March), surveys will be repeated to identify sensitive roost sites. These surveys will be conducted at the beginning of each winter season (e.g., October) and continue if evidence of roosting of birds of conservation concern is observed. › Surveys will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the Proposed Project footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. Aerial surveys using a drone may be used to confirm the presence or absence of roosting/nesting birds, where conditions are suitable. › All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked to alert all personnel on site to the suspension of works within that area.			
Construction Phase						
MX4	Health and Safety	EIAR Chapter 4, 5 Appendix 4-5	The Project Supervisor Construction Stage (PSCS) appointed for the construction stage will be required to perform their duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; › Compile and develop safety file information.	Daily	Daily	PSCS

			▸ Reporting of accidents / incidents; ▸ Weekly site meeting with PSCS; ▸ Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ▸ Induction of all site staff including any new staff enlisted for the project from time to time; ▸ Toolbox talks as necessary; ▸ Maintenance of a file which lists personnel on site, their name, nationality, current SafePass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ▸ Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ▸ Monitor the compliance of contractors and others and take corrective action where necessary; and ○ Notify the Authority and the client of non-compliance with any written directions issued. ▸ Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: ○ Six-month service – three-week visit ○ Annual service – six-week visit ○ Weekly visits as required.			
MX5	Reactive Site Drainage Management	EIAR Chapter 4, 9	The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the EnvCoW on-site. The EnvCoW will respond to changing weather, ground or drainage conditions on the ground as the Proposed Project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever	As required	As Necessary	EnvCoW

			combinations are deemed to be most appropriate to situation on the ground as a particular time. In the event that works are giving rise to siltation of watercourses, the EnvCoW will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.			
MX6	Water Quality and Monitoring	EIAR Chapter 9	Daily monitoring of excavations and the water treatment system by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped, and a geotechnical assessment will be undertaken. Daily inspection and recording of surface water management system by on-site EnvCoW and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the site. The following periodic inspection regime will be implemented: › Daily general visual inspections of site operations and inspections of all drainage infrastructure within the site and in the surrounding area by the EnvCoW or a suitably qualified and competent person as delegated by the EnvCoW; › Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; › Event based inspections by the EnvCoW as follows: ○ >10 mm/hr (i.e. high intensity localised rainfall event);	Daily	As Necessary	EnvCoW / Project Hydrologist

			○ >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, ○ Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). › Monthly site inspections by the Project Hydrologist/ EnvCoW during construction phase; › Quarterly site inspections by the Project Hydrologist/ EnvCoW after construction for a period of one year following the construction phase; and, › A written record will be maintained or available on-site within this CEMP which will be maintained on-site during the construction phase. › Daily inspection and recording of surface water management system by on-sit EnvCoW and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the site. Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control in support of the EnvCoW in monitoring the effectiveness of the drainage design as it is implemented on-site.			
MX7	Water Discharge	EIAR Chapter 4 Appendix 4-4 Appendix 4-5	› There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses › Dewatering silt bags are also used where water is pumped temporarily from excavations (e.g., turbine bases). Water is pumped into the silt bags, and then arising discharge is filtered through the silt bag fabric and flows into local collector drains. › Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas.	As Required	As Necessary	EnvCoW / Project Hydrologist

MX8	Surface Water Quality	EIAR Chapter 9	› During the construction phase field testing (visual, supplemented with pH, electrical conductivity, temperature, dissolved oxygen and turbidity monitoring), sampling and laboratory analysis of a range of parameters[12] with relevant regulatory limits and EQSs will be undertaken for each primary watercourse, and specifically following heavy rainfall events (i.e. weekly, monthly and event-based). › The data will be processed and analysed and works will cease if elevated turbidity concentrations are recorded. In this event, all upstream silt traps and drainage routes will be inspected to identify the cause of the elevated turbidity levels. Works will not recommence until any issues have been resolved and the turbidity concentrations have returned to background concentrations.	As Required	Monthly	EnvCoW
MX9	Plant and Equipment Inspections	EIAR Chapter 9	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	EnvCoW
MX10	Traffic and Transport	Appendix 4-4	The Proposed Construction Haul Routes adjacent to the Project Site will be regularly inspected for cleanliness and cleaned as deemed necessary by the construction Site Supervisor/Site Manager.	As required	Monthly	EnvCoW
MX11	Biodiversity	Appendix 4-4	The Project Ecologist will be available to support the EnvCoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the Proposed Project. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required. The responsibilities and duties of the Project Ecologist/Ornithologist will include the following:	As required	As required	Project Ecologist

[12] *example suite: pH (field measured), Electrical Conductivity (field measured), temperature (field measured), Dissolved Oxygen (field measured), Turbidity (NTU) (sonde measured), Flow (m/s), Total Suspended Solids (mg/l), Ammonia, Nitrite (NO_2) (mg/l), Ortho-Phosphate (P) (mg/l), Nitrate (NO_3) (mg/l), Phosphorus (unfiltered) (mg/l), Chloride (mg/l), and BOD (mg/l).*

			› Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. › Inform and educate on-site personnel of the ornithological and ecological sensitivities within the site. › Oversee management of ornithological and ecological issues during the construction period and advise on ornithological and ecological issues as they arise. › Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.			
MX12	Birds	EIAR Chapter 7	A CEMP has been prepared (see Appendix 4-4) and will be in place prior to the start of the construction phase. Best practice measures which form part of the design of the project are included in Chapter 4 of the EIAR. Note that these measures are proposed as industry best practice rather than to mitigate any identified significant effect and will be updated as required to address any conditions of a permission or findings of any pre-construction survey results.	As Required	As required	Project Ornithologist
MX13	Peat and Spoil Management / Instability	Appendix 4-3 Appendix 8-1	To monitor possible peat movements, it is proposed to install sighting posts upslope and downslope of the access roads and turbine hardstands at staggered intervals at locations where the peat depth is greater than 2.5m. Additional monitoring locations will be required at infrastructure locations with deeper peat deposits, as determined by the Designer or Project Geotechnical Engineer. Details of sighting posts are given below. › A line of sighting posts will comprise: ○ A line of wooden stakes (typically 1 to 1.5m long) placed vertically into the peat to form a straight line. ○ The sighting line will comprise 6 no. posts at 5m centres that is a line some 25m long.	As required	Every 6 Months	Geotechnical Engineer

			○ A string line will be attached to the first and last posts and all intervening posts will be adjusted so they are just touching the string line. › Lines of sighting posts will be placed across the existing slope about 5m away from the area to be worked. It is recommended that the posts are located along the road at 10m intervals in areas of deep peat (greater than 2.5m). Where there are relatively steeper slopes or softer ground a sighting line will be placed down the slope, or at any location where monitoring is deemed necessary by the Designer or the Project Geotechnical Engineer. › Each line of sighting posts will be uniquely referenced with each post in the line given a reference. The post reference will be marked on each post (e.g. reference 1-1, 1-2, 1-3, 1-4, 1-5, 1-6 for posts in line 1). › The sighting lines will be monitored at the beginning of each working day, and during the day where considered appropriate (e.g. when working activity is concentrated at a specific location). › Monitoring of the posts will comprise sighting along the line and recording any relative movement of posts from the string line. › Where increased movements are recorded the frequency of monitoring will be increased. › A monitoring record will be kept of the date, time and relative movement of each post, if any. This record will be updated and stored as a spreadsheet.			
MX14	Archaeological Monitoring	EIAR Chapter 14	Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS will be carried out by a suitably qualified archaeologist. Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as	As Required	As Required	Project Archaeologist

			referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.			
MX15	Traffic Management	EIAR Chapter 15	It is proposed that speeds will be monitored by means of a one-off 7-day traffic count at Site Entrance B, C and E during the construction phase of the Proposed Project.	As Needed	As Needed	Traffic Consultant

9. PROGRAMME OF WORKS

9.1 Construction Schedule

It is estimated that the construction phase will take approximately 30 to 36 months from the commencement of works to the commissioning of the wind farm. The commencement of construction works where the removal of woody vegetation is required, or where works take place in sensitive breeding habitats (such as birch scrub and emergent wetland vegetation), will be scheduled to occur outside the bird nesting season (1st of March to 31st of August) to avoid any potentially significant effects on currently nesting birds. Construction may commence at any stage from September onwards to March, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season; please note, certain construction activities such as forestry felling, immature woodland removal and scrub clearance will not be carried out during the bird breeding season. However, it is envisioned that these works will take place at the beginning of the construction phase and therefore no overlap with the breeding bird season is envisioned.

Construction activities will be carried out during normal daytime working hours (i.e., weekdays 0700 – 1900hrs and Saturdays 0700 – 1400hrs). However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out-of-hours working will be agreed in advance with the Local Authorities.

The phasing and scheduling main construction task items are outlined in Table 9-1 below.

Table 9-1 Indicative Construction Schedule

ID	Task Name	Task Description	2030				2031				2032			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety													
2	Grid Connection	Construct Proposed Grid Connection to Maynooth-Dunstown 220kV overhead line												
3	Site Compounds	Site compounds, site access, fencing, gates												
5	Site Roads	Construction/upgrade of roads, install drainage measures, install water protection measures												
6	Turbine Hardstands	Excavate/pile for turbine bases where required												
7	Turbine Foundations	Fix reinforcing steel and anchorage systems, erect shuttering, concrete pour												
8	Substation and Electrical Works	Construct Proposed Onsite Substation and Proposed Offsite Substation, and underground cabling between turbines												
9	Backfilling and Landscaping													
10	Turbine Delivery and Erection													

11	Substation Commissioning									
12	Turbine Commissioning									

10. COMPLIANCE AND REVIEW

10.1 Site Inspections and Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the EnvCoW and the Site Supervisor/Construction Manager to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP and all other planning application documents. Only suitably trained staff will undertake environmental site inspections.

10.2 Auditing

An Environmental audit will first be carried out prior to the construction phase of the Proposed Project to ensure the implementation of pre-construction mitigation measures, completion of baseline studies and implementation of any pre-construction felling mitigation measures. Further environmental audits will be carried on a monthly basis during the construction phase of the Proposed Project and again after the commissioning of the wind turbines and substation.

In contrast to monitoring and inspection activities, audits are designed to shed light on the underlying causes of non-compliance and not merely detect the non-compliance itself. In addition, audits are the main means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the EnvCoW on behalf of the Project Developer, in an objective manner. Environmental audits will be conducted at planned intervals to determine whether the CEMP is being properly implemented and maintained. The results of environmental audits will be provided to the Project Developer and Project Contractor.

An audit of compliance with the pre-commencement mitigation measures will be completed by the EnvCoW prior to the commencement of the construction phase of the Proposed Project. An audit of compliance with the construction phase mitigation measures will be completed monthly during the construction phase. The findings of each audit will be documented by the EnvCoW within the EMP for the Project Site. The findings of each audit will be made available to ACP on request.

Once the Proposed Project is operational and turbines have been commissioned, a report of compliance with operational phase mitigation measures will be prepared.

10.3 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during construction of the wind farm:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme (EMP)) has been exceeded.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the EMP.

10.4 Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Site Supervisor/Construction Manager, as advised by the Site EnvCoW. Corrective actions may be required as a result of the following:

- Environmental Audits;
- Environmental Inspections and Reviews;
- Environmental Monitoring;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention, direct communications between the Site Supervisor/Construction Manager and the EnvCoW will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

10.5 Construction Phase Review

The Project Contractor's CEMP will be the subject of review by the EnvCoW on behalf of the Project Developer whenever a revised version of the CEMP is presented for approval.

References

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