APPENDIX 4-5

CONSTRUCTION AND ENVRVIRONMENTAL MANAGEMENT PLAN

Planning and Environmental Consultants

Construction and Environmental Management Plan

Gannow Renewable Energy Development, Co. Galway

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1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been prepared by MKO on behalf of the Applicant, Gannow Ltd. who intends to apply to Galway County Council (GCC) for planning permission to construct a renewable energy development comprising 8 no. wind turbines and associated infrastructure in the townlands of Gannow and adjacent townlands, near Athenry in Co. Galway, and a 38kV on-site substation and associated works, including underground 38kV cabling to connect to the national grid at Cashla 220kV substation, in the townland of Barrettspark, Co. Galway.

As detailed in Section 1.1.1 in Chapter 1, f or the purposes of this EIAR, the following references are used: 'Proposed Project', 'Proposed Wind Farm', 'proposed turbines', 'Proposed Grid Connection', 'Site' and 'Proposed Wind Farm site'. Please see Section 1.1.1 of this EIAR for further details. 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 NIS which 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 and operation. The Contractor, as appointed by the Project Developer, 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 to be prepared by the appointed contractor 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 Environmental Clerk of Works (ECoW)

1.1 Scope of the Construction and Environmental Management Plan

This CEMP is presented as a guidance document for the construction of the Proposed Development.

The Proposed Project is located within the EIAR Site Boundary or the 'Site' which measures approximately 884 hectares (ha). The Proposed Project layout is illustrated on Figure 2-3 below.

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

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

Section 3 sets out details of the environmental controls to be implemented on site. Site drainage principles, traffic management, dust control, invasive species management and a 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 three separate headings, 1) pre-commencement measures; 2) construction-phase measures and 3) operational-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 three separate headings, 1) pre-commencement measures; 2) construction-phase measures and 3) operational-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.

1.2 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:

- Using 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;
- Keeping 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 Site is kept in place at all times.

2. SITE AND PROPOSED PROJECT DETAILS

2.1 Site Location

The Proposed Wind Farm site is located within a rural, agricultural setting in eastern Galway, approximately 9.7km east of Athenry, Co. Galway and 13km north of Loughrea, Co. Galway. The village of Attymon, Co. Galway is located approximately 1km northwest of the nearest proposed turbine (T01) and the village of New Inn is located approximately 4.6km southeast of the nearest proposed turbine (T07).

The Proposed Grid Connection includes for 38kV underground cabling from the proposed onsite 38kV substation, in the townland of Attimonmore South, Co. Galway, to the existing Cashla 220kV substation in the townland of Barrettspark, Co. Galway. The Proposed Grid Connection measures approximately 21.8km in length and is located primarily within the curtilage of the public road corridor with three sections (approximately 0.2km, 0.6km and 1.5km) being located within private land.

The Site measures approximately 884ha and comprises a mix of agri-pastoral land and cutover bog. The L3115 Local Road runs in north-south orientation along the western boundary of the Proposed Wind Farm site and in an east-west orientation along the northern boundary of the Site. Existing access is via an existing agricultural entrance off the L3115 local road. The Site is also served by a number of existing agricultural roads and tracks. The Grid Reference co-ordinates for the approximate centre of the Proposed Wind Farm site are X 561556 Y 729624 (ITM).

Current land-use on the Proposed Wind Farm site is predominantly comprised of peat cutting activities, commercial forestry, and pastoral agriculture land. Current land-use along the Proposed Grid Connection comprises of public road corridor, public open space, private track, and private land principally used by agriculture. Land-use on the wider landscape comprises a mix of pastoral agriculture, peatlands, low-density residential, and small-scale commercial properties.

A full and detailed description of the Proposed Project (i.e. the Proposed Wind Farm and the Proposed Grid Connection) 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 of the EIAR.

The townlands in which the Proposed Project is located are listed in Table 1-1 in Chapter 1. All townlands are located in Co. Galway.

2.2 Description of the Proposed Project

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 2-1. The Proposed Grid Connection layout is illustrated on Figure 2-2. Figure 2-3 illustrates the overall layout of the Proposed Project (i.e. the Proposed Wind Farm and Proposed Grid Connection together). Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 to the EIAR.

1:2,000 Scale of Proposed Met Mast Location

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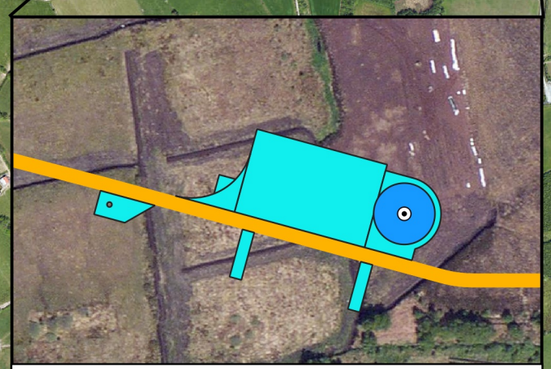
1:2,500 Scale of Proposed Turbine, Foundation and Hardstand



Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- Proposed Turbine Foundations
- Proposed Hardstands
- Proposed Met Mast
- Proposed Upgrades to Existing Roads
- Proposed New Roads
- Proposed Temporary Construction Compounds
- Proposed Onsite 38kV Substation
- Proposed Turbine Delivery Route

Drawing Title: Proposed Wind Farm Layout

Project Title: Gannow Renewable Energy Development

Drawn By	Checked By
CJ	EC
Project No.	Drawing No.
240323	Figure 2-1
Scale	Date
1:12,500	2025-09-15

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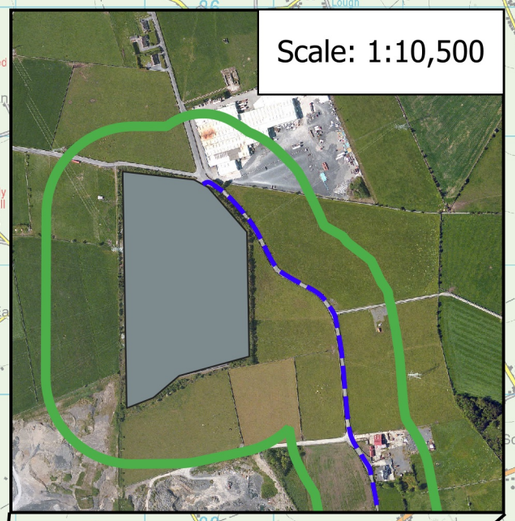

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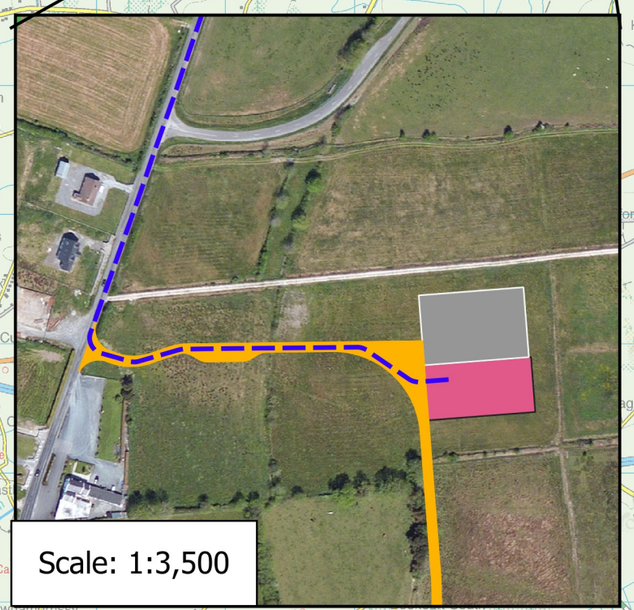

Scale: 1:3,500

Map Legend

- EIAR Site Boundary
- Proposed Grid Connection
- Cashla 220kV Substation
- Proposed Temporary Construction Compounds
- Proposed New Roads
- Proposed Onsite 38kV Substation

Drawing Title: Proposed Grid Connection Layout

Project Title: Gannow Renewable Energy Development

Drawn By	Checked By
CJ	EC
Project No.	Drawing No.
240323	Figure 2-2
Scale	Date
1:47,500	2025-09-18

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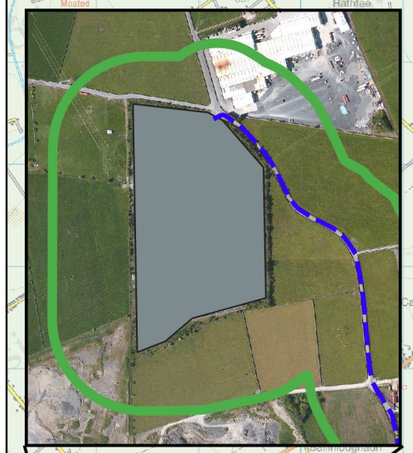

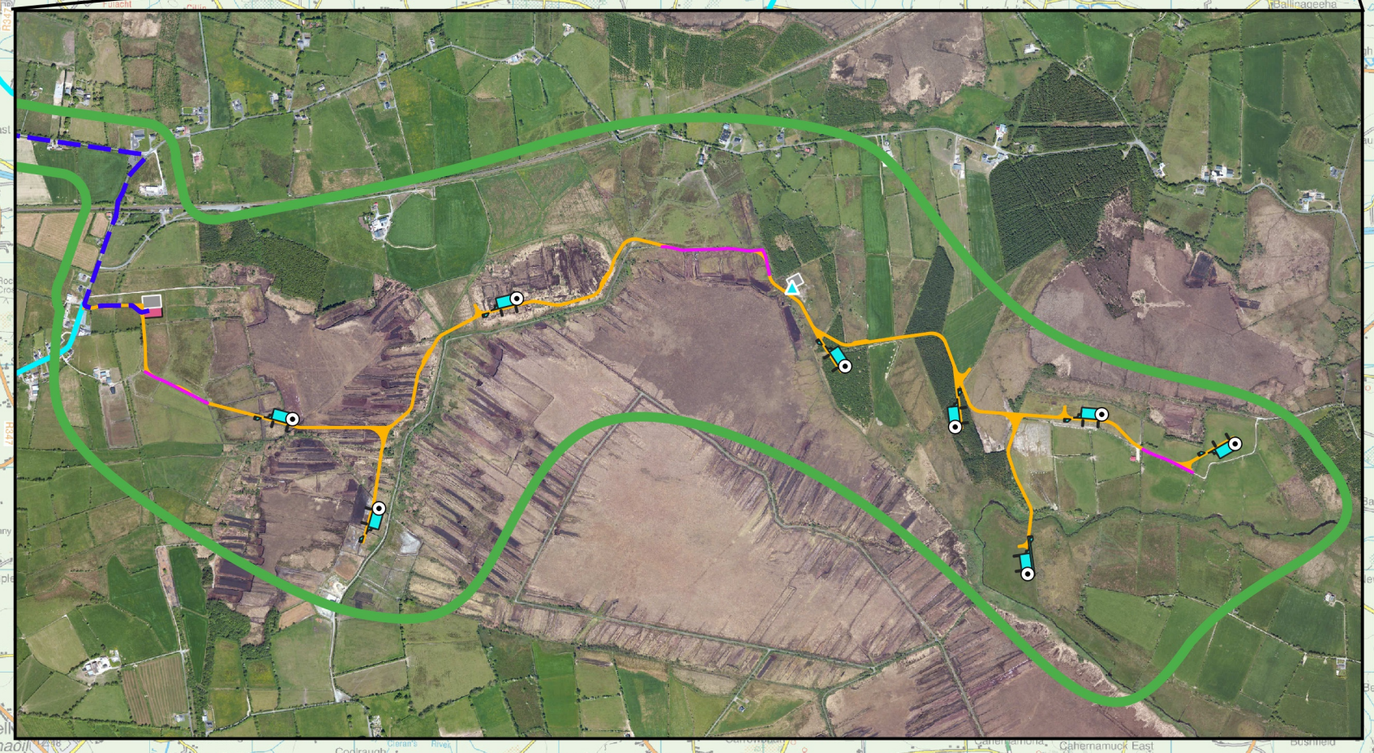

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Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- Proposed Turbine Foundations
- Proposed Hardstands
- Proposed Met Mast
- Proposed Upgrades to Existing Roads
- Proposed New Roads
- Proposed Temporary Construction Compounds
- Proposed Grid Connection
- Proposed Onsite 38kV Substation
- Cashla 220kV Substation
- Proposed Turbine Delivery Route

Drawing Title

Proposed Project Layout

Project Title

Gannow Renewable Energy Development

Drawn By	Checked By
CJ	EC
Project No.	Drawing No.
240323	Figure 2-3
Scale	Date
1:60,000	2025-09-08

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2.3 Construction Management Practices Overview

2.3.1 Introduction

An experienced main 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
- Turbine Hardstanding Areas;
- Meteorological Mast Foundation;
- Site Roads (New and Upgrade to existing tracks);
- Site Drainage System;
- Site Entrance Management;
- Watercourse/Culvert Crossings;
- Peat and Spoil Management Areas;
- Temporary Construction Compounds;
- Tree Felling and Replanting;
- Biodiversity Management and Enhancement Measures;
- Underground Electrical (20/33kV) and Communication Cabling;
- Onsite 38kV Electricity Substation and Control Buildings;

Proposed Grid Connection:

- Underground Electrical (38kV) and Communication Cabling;
- Existing Underground Services;
- Joint Bays;
- Underground Cabling Watercourse/Culvert/Service Crossings

2.3.3 Proposed Wind Farm

2.3.3.1 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final

turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbines foundations, ranging from circular to hexagonal and square, depending on the requirements of the final turbine supplier. The turbine foundation transmits any loads on the wind turbine into the ground. The maximum horizontal and vertical extent of the turbine foundation will be 25m and 3.5m respectively, which has been assessed in the EIAR.

After the foundation level of each turbine has been formed using piling methods or on competent strata (i.e. bedrock or subsoil of sufficient load bearing capacity), the "Anchor Cage" is levelled, and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to finished surface level following completion of the foundation.

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 site with excavated peat and spoil being transported to the identified peat and spoil management areas within the 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. *A layer of lean-mix blinding will be laid approximately 75mm thick directly on top of the newly exposed formation, tamped and finished with a screed board to leave a flat level surface. 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 management areas within the 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 management areas within the 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 form here.*

2.3.3.2 Turbine Hardstanding 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, 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 main body of the crane hardstands (i.e not including the blade fingers and turbine foundation) will be constructed in a similar manner to the excavated site roads. The main body of the crane hardstand area will measure approximately 35m x 55m.

The precise sizes, arrangement and positioning of hard standing areas are dictated by turbine suppliers. The proposed hard standing areas are illustrated in the detailed drawings included in Appendix 4-1 of the EIAR. The extent of the required areas at each turbine location may be optimised on-site depending on topography, position of the Site access road, the proposed turbine position and the turbine supplier's exact requirements.

2.3.3.3 Meteorological Mast Foundation

One meteorological (met) mast is proposed as part of the Proposed Wind Farm. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E561634, N730028 (ITM) as shown on the Proposed Wind Farm site layout drawing in Figure 4-1 of the EIAR and the detailed site layout drawings included as Appendix 4-1. The met mast will be a free-standing slender lattice structure 30m in height. It will be constructed on a hard-standing area

sufficiently large to accommodate the equipment that will be used to erect the mast. A standard detail of a meteorological mast is shown in Figure 4-12 of the EIAR.

The met mast foundation will be formed at a suitable level directed by the Geotechnical Engineer/Designer. 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 the Proposed Wind Farm site with excavated Peat and spoil being transported to the identified peat and spoil management areas within the 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 above in Section 2.3.3.1.

2.3.3.4 Site Roads

To facilitate travel within the Site and to connect the various project components together, existing onsite tracks will need to be upgraded and new access roads will need to be constructed. The Proposed Project makes use of the existing track network insofar as possible. The proposed site access roads will be constructed using the methodology summarised below.

Upgrade of Existing Access Roads or Tracks

Existing roads will require upgrading which will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary.

The general construction methodology for upgrading of existing sections of access roads or tracks is summarised below.

i. *Access road construction will be to the line and level requirements as per design*
ii. *For upgrading of existing excavated access roads the following guidelines will be implemented in full*
    a. *Excavation of the widened section of access road will take place to a competent stratum beneath the peat (as agreed with the designer) and backfilled with suitable granular fill.*
    b. *Benching of the excavation may be required between the existing section of access road and the widened section of access road where the depth of excavation required exceeds 500mm.*
    c. *The surface of the existing access road will be overlaid with up to 500mm of selected granular fill.*
    d. *Access roads will be finished with a layer of capping across the full width of the track.*

e. *A layer of geogrid/geotextile may be required at the surface of the existing access road and at the base of the widened section of access road (to be confirmed by the designer).*
f. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*

iii. *The finished road width will have a running width of 5m, with wider sections on bends and corners.*
iv. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road, where possible.*
v. *At transitions between new floating and existing excavated roads a length of about 10 to 20m will have all peat excavated and placed with suitable fill. The surface of this fill will be graded to accommodate wind turbine construction and delivery traffic*

Construction of New Roads

New road will comprise a roadway with a total running width of approximately five metres, with wider sections at corners and the laying of appropriate surface dressing on the new roadway where necessary. The proposed new road will comprise excavated road and floating road.

The construction methodology for the proposed new excavated roads and turbine hardstands is outlined as follows:

i. *Prior to commencing the construction of the excavated roads movement monitoring posts should be installed in areas where the peat depth is greater than 2.0m.*
ii. *Interceptor drains should be installed upslope of the access road alignment to divert any surface water away from the construction area.*
iii. *Excavation of roads shall be to the line and level given in the design requirements. Excavation should take place to a competent stratum beneath the peat (as agreed with the site designer).*
iv. *Road construction will be carried out in sections of up to 20m lengths i.e., no more than 20m of access road will be excavated without replacement with stone fill.*
v. *Excavation of materials with respect to control of peat stability:*
    a. *Where Acrotelm (to about 0.3 to 0.4m of peat) is required for landscaping, it will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
    b. *Where possible, 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, where possible, to the designated peat and spoil management areas.*
vi. *Once excavated, non-catotelm peat will be temporarily stored in localised areas adjacent to excavations for roads and hardstands before being placed into the permanent Peta and Spoil management Areas. All temporary peart and spoil management areas will be upslope of founded roads/hardstands and will be inspected by the Project geotechnical Engineer before material is stored in the area.*
vii. *Excavation side slopes in peat shall be not greater than 1 (v): 2 or 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 should be carried out as the excavation progresses.*
viii. *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
ix. *The excavated access road will be constructed with an average depth of 750mm of selected granular fill. Granular fill will be placed and compacted in layers in accordance with the TII Specification for Road Works.*

x. Access roads will be finished with a layer of capping across the full width of the road.
xi. *A layer of geogrid/geotextile may be required at the surface of the competent stratum where cohesive material is present to prevent mixing of the underlying material with the granular fill.*
xii. *At transitions between floating and excavated roads a length of road of about 10 to 20m shall have all peat excavated and replaced with suitable fill. The surface of this fill shall be graded so that the road surface transitions smoothly from floating to excavated road.*
xiii. *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.*
xiv. *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.*

The construction methodology for the proposed new floating roads is outlined as follows:

i. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m and will be placed at 10m intervals along these sections.*
ii. *Base geogrid will be laid directly onto the existing peat surface along the line of the road in accordance with geogrid provider's requirements.*
iii. *Construction of road will be in accordance with appropriate design from the designer.*
iv. *The make-up of the new floated access road is up to 1,000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator*
v. *Granular fill will be placed and compacted in layers in accordance with the designer's specifications.*
vi. *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.*
vii. *The finished road running width will be 5m, with wider sections on bends and corners.*
viii. *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.*
ix. *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.*
x. *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.*
xi. *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.*
xii. *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.*

2.3.3.5 Site Drainage System

The early establishment of the drainage system will manage the risk of impacts on watercourses on and adjacent to the Site during construction. In addition, construction operations will adopt best working practices, and the development of the Site will be phased accordingly.

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 ECoW. Surface water management and drainage design principles are outlined in Section 3.2.2 below and Section 4.6.3 of the EIAR.

2.3.3.6 Site Entrance Management

Construction and Operational Site Entrance

The Proposed Wind Farm site will have a new access point off the L3115 local road along the western boundary of the Proposed Wind Farm site in the townland of Attimonmore South, Co. Galway. This entrance will be used during both the construction and operational phase of the Proposed Project. Appropriate sightlines will be established at the proposed Site entrance for the safe egress of traffic during the construction phase. As part of the construction of the site entrance the existing field boundary will be removed, and temporary fencing will be put in place. Temporary overrun areas will be constructed to facilitate delivery of oversized loads during the construction phase. On completion of the construction phase, this Site entrance will be reduced in size and gated for security with the original roadside boundary reinstated either side of the gate, and will be used as the operational phase entrance.

2.3.3.7 Watercourse/ Culvert Crossings

The Site is extensively drained by a network of natural watercourses and manmade land drains. The following watercourses flow through the Proposed Wind Farm site:

- Raford River – flows within the southeast of the Proposed Wind Farm site (around T08) and is hydrologically connected to the Raford River Bog NHA
    - Raford River tributary flows through the western portion of the Proposed Wind Farm across proposed new roads near T03

To facilitate the construction of Proposed Wind Farm roads, it is required to cross 2 no. natural watercourses, the Raford River (access road to T08) and the Raford River tributary (to the west of T03). Both watercourse crossings will be via new clear span crossings. There are several field drains within the Proposed Wind Farm site which will be crossed by appropriately sized pipe crossing.

Clear-Span Watercourse Crossing

It is proposed to construct a clear-span watercourse crossing at the 2 no. locations where new watercourse crossings are required within the Proposed Wind Farm site. The locations of these crossings are shown on the layout drawings included in Appendix 4-1 and Figure 4-31 in the EIAR. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows:

- 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.
- All drainage measures along the proposed road will be installed in advance of the works.
- 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.
- 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.
- 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.
- Where the bottomless box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse,
- Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.
- Underground cabling ducting will be contained within the road make-up of the proposed crossing.

A standard design drawing of a pre-cast concrete, clear span crossing is shown in Figure 4-28 of the EIAR and included within the detailed planning drawings.

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. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.

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

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 have to 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 900m 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 4-29 of the EIAR for details.

2.3.3.8 Peat and Spoil Management Areas

It is proposed to manage any excess overburden generated through construction activities locally within the Proposed Wind Farm site, in peat and spoil management areas, as depicted in Figure 4-21 of Chapter 4.

Peat and spoil will be managed locally within the Proposed Wind Farm site, in dedicated peat and spoil management areas as shown on Figure 4-21 in the EIAR. The placement of peat and spoil within the peat and spoil management areas will be undertaken as follows:

1. *Excavated peat will be placed/spread across the designated areas within the Proposed Wind Farm site.*
2. *The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat will be placed in the centre of the peat management areas with firmer spoil /drier peat placed around the outside.*
3. *The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.*
4. *It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.*
5. *Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate.*
6. *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 and spoil within the peat and spoil management areas.*
7. *Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site.*
8. *Supervision by the Project Geotechnical Engineer will be carried out for the works.*
9. *An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.*

The total volume of peat requiring management onsite is estimated at 89,750m3 and the total volume of spoil requiring management onsite is estimated at 30,950m3. This material will be excavated and deposited in the peat and spoil management areas, with a total capacity volume of 130,500m3, around turbine foundations and hardstands within clear felled areas, sidecasting along access roads, and landscaping. As such, there is enough capacity in the peat and spoil management areas within the Proposed Wind Farm site, for the total volumes of peat and spoil requiring management for the Proposed Wind Farm as well as for associated drainage.

All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction.

2.3.3.9 Temporary Construction Compounds

There are 2 no. temporary construction compounds proposed as part of the Proposed Wind Farm. The primary construction compound will be located adjacent of the proposed onsite 38kV substation and measures approximately 2,400m^2 in area. The secondary construction compound will be located north of T04 and measures approximately 1,575m^2 in area. The compounds will be constructed in the same manner, as follows:

- The compound area will be marked out at the corners using ranging rods or timber posts. Drains and associated settlement ponds will be installed around the perimeter (refer to Section 3.2.4 below);

- The compound will be established using a similar technique as the construction of new roads as discussed below;
- Where required, a layer of geogrid will be installed, 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;
- Areas within the compound will be constructed as site roads and used as vehicle hard standings during deliveries and for parking;
- A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc.;
- A waste storage area will be provided within the compound;
- If necessary the compound will be fenced and secured with locked gates, although fencing would only be utilised where significant risk of danger to third parties or vandalism is envisaged;
- Upon completion of the construction phase of Proposed Project, the compound will be decommissioned and allowed to re-vegetate naturally, landscaping with topsoil as required;
- During the construction phase, a temporary toilet block unit will located within the temporary construction compound for use during the construction phase. Elsewhere on site, self-contained port-a-loo with an integrated waste holding tank will be used on site for toilet facilities. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by an appropriately consented waste collector to wastewater treatment plants, and;
- The water supply to the site will be from a temporary water storage tank which will be filled using a mobile water tank which will source water locally as required

2.3.3.10 Biodiversity Management and Enhancement Measures

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is included as Appendix 6-4 to the EIAR.

High value habitats were identified during initial habitat surveys of the Proposed Wind Farm site and include Annex 1 areas active raise bog, wet heath, and Molina meadow mosaic. The Proposed Project has been designed to avoid these areas and where they are located adjacent to proposed works areas, fencing will be implemented with appropriate signage prohibiting entrance to the areas.

2.3.3.10.1 *Habitat Creation*

Hedgerow Planting

It is proposed to plant 3,521m of hedgerow habitat within the Proposed Wind Farm site. The hedgerow planting areas are depicted on Figure 3-1 in Appendix 6-4 of the EIAR and have been strategically chosen to link up existing areas of bat activity.

When planting new hedgerows, plants will be closely spaced (a maximum of 50cm apart) and planted in a staggered row. The new hedgerow will need to be protected from poaching by livestock, through the erection of new stockproof fencing where required, which should be at least 1m away from the hedge, and on each side if required. The below listed species, which were identified as being locally present during the detailed habitat surveys undertaken or identified as being suitable native species found within the wider local area, will be used in the species composition.

Riparian Tree Planting

Riparian planting will be carried out along the Raford River in the east of the Proposed Wind Farm site; all saplings will be planted by hand to reduce to potential for bare soil exposure and sediment runoff. Strictly no fertilisers are to be used in the riparian zone.

Species to be planted include:

- Hawthorn (Crataegus monogyna)
  - Proportion of hedgerow mix: 75%
  - Age class to be planted: combination of whips and advanced nursery stock (10cm – 12 cm girth trees) to increase structure diversity.
- Hazel (*Corylus avellana*)
- Blackthorn (*Prunus spinosa*)
- Rowan (*Sorbus aucuparia)*
- Elder (*Sambucus nigra)*
- Goat Willow (*Salix caprea*)
- Grey willow (*Salix cinerea)*

Hedgerow Management

Management measures for hedgerow post planting include:

- Hedgerows to be trimmed on a 2- or 3-year rotation to maximise structural diversity and to prevent over-trimming,
- Hedgerows to reach approx. 2.5m height with an 'A' shape,
- Cut hedgerows between November and January. This will avoid the bird nesting season (March 1st to August 31st) and will avoid impacts on foraging pollinators,
- It is expected that ivy will self-colonise, and this will be retained where possible,
- Grassy margins will be retained to preserve flowering ground flora,
- Avoid the use of fertilisers, slurry, herbicides and pesticides.

Peatland Enhancement

There will be a loss of approx. 4ha of cutover bog habitat as a result of the Proposed Wind Farm. In order to offset this loss, it is proposed to enhance an area measuring 5.3ha which currently consists of cutover, drained peatland on the margin of Article 17-mapped Active Raised Bog. This area is depicted as Block D in Figure 3-1 of Appendix 6-4 of the EIAR. Excavated peat generated as a result of construction in peat areas will be used for enhancement purposes here and will be strictly restricted to peat. It is anticipated that blocking the existing drains within this area, as well as ceasing further turbary activity will allow subsurface water levels to rise, making the area wetter and allowing for colonisation of wetland plants. This will in turn be of hydrological benefit to the adjacent Article 17 mapped raised bog area. It is important when blocking drains to consider the hydrology of the Proposed Wind Farm site in order to maximise the benefits to the onsite water table. This can be assessed by field or GIS surveys, which highlight slope and drainage to inform decisions on where to place dams. A map of the existing drains within Block D is shown in Figure 3-2 of Appendix 6-4. Locations of drain blocking and peat profiling will be confirmed by the Project Ecologist and Hydrologist in advance of commencement of works in this area. The key management objectives to be carried out within this area are as follows:

- Cease any further peat cutting activity
- Block existing drains using plastic corrugate or excavated peat sods at strategically chosen points according to existing drainage depicted on Figure 3-2 of Appendix 6-4.
- Plug planting of Sphagnum on bare peat areas
- Removal of Gorse outside of bird nesting season

Re-profiling of sheer face banks to create a soft slope to be revegetated via recolonisation as well as plug planting with Sphagnum and devils bit scabious

Marsh Fritillary Breeding Habitat

The Proposed Project has been designed such that existing areas of breeding marsh fritillary habitat have been avoided and retained, as discussed in Section 3.1 of Appendix 6-4 to the EIAR. It is further proposed to create additional areas of potential breeding habitat for the populations of marsh fritillary within the Proposed Wind Farm site, and 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.

It is proposed to convert 4.5ha of existing conifer forestry to grasslands comprising devils bit scabious (*Succisa pratensis),* the larval foodplant of the species, within the Proposed Wind Farm site. This will be achieved as follows (please see Blocks F and H, Figure 3-1 of Appendix 6-4):

- Forestry to be felled and removed.
- Coniferous forestry stumps will be left in-situ.
- The areas will be spread with a layer of peat excavated during ground works for the Proposed Project.
- The underlying soils will be treated organically, and no herbicides or fertilisers will be added.
- The soils will be plug planted with devils bit scabious with plants from a certified native source.
- It is also proposed to plant local willow species along the southwest boundary of the proposed grassland around Block F (outside of the bat buffer) to provide shelter and increase suitability for marsh fritillary.
- Habitat maintenance of the newly established areas which are adjacent to existing forestry will involve the eradication of self-seeding conifers.

It is also proposed to create suitable marsh fritillary habitat adjacent to existing breeding areas near proposed turbine T03, i.e within cutover peatland, by planting the proposed peat management area with devils bit scabious; this area measures 3.5ha (Block C).

Planting of Native Woodland

It is proposed to plant 1.9ha of native woodland within the Proposed Wind Farm site (Blocks M and O in Figure 3-1 of Appendix 6-4). Trees will be locally sourced, will be of native origin and will be of advanced nursery stock where possible. The following species which are common to the locality will be used:

- Pedunculate oak (*Quercus robur)*
- Sessile oak (*Quercus petraea)*
- Hazel (*Corylus avellana)*
- Alder (*Alnus glutinosa)*
- Birch (*Betula pubescens)*
- Rowan (*Sorbus aucuparia)*
- Willows (*Salix cinerea, Salix caprea)*
- Hawthorn (*Crataegus monogyna)*

The following measures should be followed when planting trees:

- Mark out the area for planting so it is clear exactly where planting will be established.
- Use thin stakes or sticks to mark the rows or areas of trees to be planted.
- It is recommended that there are 2m spacings between trees. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row.

- Newly planted trees will need to be protected from poaching by livestock, through the installation of new stockproof fencing which should be at least 2m away from the treeline, and on each side if required. Where new trees are being planted along existing conifer plantation fencing on both sides will likely not be possible. In this case, tall tube tree guards may also be required to protect newly planted trees from wild animals such as deer

Native Woodland Management

In order to facilitate the successful establishment of the new trees to be planted within the Proposed Wind Farm site, the following measures are proposed:

- 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/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. 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.
- Newly planted hedgerows and 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 an Annual Monitoring Report.

2.3.3.11 Tree Felling and Vegetation Removal

Tree felling will be required within and around the Proposed Wind Farm infrastructure footprint to allow for the construction of the proposed turbines, access roads underground cabling, and the other ancillary infrastructure.

Approximately 7.5ha conifer plantation (WD4) and 0.1ha of native woodland/bog woodland (WN2/WN7)) will be felled to accommodate the Proposed Wind Farm infrastructure inclusive of proposed turbines and associated infrastructure and as part of the proposed enhancement as identified in Section 4.3.1.7 of the EIAR. Please note, there will also be a loss of 1.6ha of scrub (WS1) required to facilitate the Proposed Wind Farm.

Figure 4-15 of the EIAR shows the extent of commercial forestry, native woodland, as well as scrub loss and linear habitat loss to be permanently felled/removed as part of the Proposed Wind Farm.

The 7.6ha of conifer plantation/native woodland to be felled as part of the Proposed Wind Farm 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 policy requires that a copy of the planning permission for the Proposed Wind Farm be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Wind Farm.

Approximately 466m of hedgerows and tree lines require removal to facilitate the construction of the Proposed Wind Farm infrastructure, and to achieve the required Bat foraging buffers from the proposed turbines.

2.3.3.12 Tree and Vegetation Planting

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of forestry for access roads, and any other wind farm-related uses will have to be replaced by planting at an alternative site or sites. The Forest Service policy requires replacement or replanting on a hectare for hectare basis for the felling carried out as part of the Proposed Wind Farm.

The identified 7.5ha of conifer plantation that will be permanently felled for the Proposed Wind Farm will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Wind Farm site felling. 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 felled forestry as part of the Proposed Wind Farm may occur on any lands, outside of the hydrological catchment in which the Proposed Project is located, within the State benefitting from Forest Service Technical Approval[1] for afforestation, should the Proposed Project receive planning consent. 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, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Appropriate Assessment purposes).

The Applicant commits to replanting the 7.5ha of conifer plantation, outside the hydrological catchments within which the Site is located. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 7.5ha of conifer plantation. Therefore, the forestry replanting is not considered further in the impact assessment chapters of the EIAR. In addition, the Applicant commits to not commencing the Proposed Project until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority. The 0.1ha of native woodland to be felled as part of the Proposed Wind Farm will be replanted within the Proposed Wind Farm site. Please see Section 4.3.1.6.1 of the EIAR and Appendix 6-4 BMEP for details on native woodland replanting.

As identified in Section 2.3.3.10 above, approximately 3,521m of linear habitat will be planted as part of the Proposed Project. The 1.6ha loss of scrub habitat will be offset by the proposed native woodland replanting identified in Section 2.3.3.10 above; please see Appendix 6-2 Bat Survey Report and Appendix 6-4 BMEP for further information.

2.3.3.13 Underground Electrical (33kV) and Communication Cabling

The transformer in each turbine and the met mast will be connected to the on-site substation through a network of underground electrical and communication cabling. The ground is trenched using a mechanical excavator. The top layer of soil (or road surface) is removed and saved so that it is replaced on completion. The cable ducting will be bedded with suitable material. The cabling will be laid at a depth of approximately 1.2m below ground level; a suitable marker tape is installed between the cabling and the surface (see Plate 2-1 below illustrating an example of a single 33kV cable trench and Plate 2-2 below illustrates an example of a trefoil 33kV cable trench). On completion, the ground will be reinstated. The route of the underground electrical and communication cabling will follow the access tracks as illustrated on the Proposed Wind Farm layout drawings included as Appendix 4-1 of

[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.*

the EIAR. The cabling may be placed on either side of the road footprint, on both sides of the road and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

Plate 2-1 Typical Single Cable Trench View

Plate 2-2 Typical Trefoil Cable Trench View

2.3.3.14 Onsite 38kV Electricity Substation and Control Buildings

A detailed drawing of the proposed onsite 38kV substation is shown in Appendix 4-1. The proposed onsite 38kV substation will be constructed by constructed by the following methodology:

- The area of the on-site substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in

landscaping. Any excess material will be sent to one of the designated peat and spoil management areas.
- A stoned out hardstand area will then be established using locally sourced materials.
- The dimensions of the onsite substation area have been designed to meet the requirements of the ESBN and the necessary equipment to safely and efficiently operate the Proposed Wind Farm;
- The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- The block work walls will be built up from the footings to DPC level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors.
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation.
- The roof slabs will be lifted into position using an adequately sized mobile crane.
- The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on-site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- The transformer, electrical equipment, and storage container plinths will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed.
- The electrical equipment will be installed and commissioned.
- Perimeter fencing will be erected.
- The construction and components of the substation will be built to ESBN specifications.

1 no. control building will be built within the on-site substation compound.

The 2 no. storage containers located adjacent to eastern boundary of the proposed onsite 38kV substation compound will be constructed in a similar manner as the temporary construction compound methodology identified below in Section 4.8.1.8 of Chapter 4.

2.3.4 Proposed Grid Connection

2.3.4.1 Underground Electrical (38kV) and Communication Cabling

The underground cabling works will consist of the installation of ducting in an excavated trench to accommodate electrical and fibre communications cabling to facilitate a connection between the proposed onsite 38kV substation and the existing 220kV Cashla Substation. Please see Appendix 4-1 for details.

The underground cabling will be laid underground using the following methodology:

- Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified. All relevant bodies i.e., ESBN, Galway County Council etc. will be contacted and all up to date information for all existing services sought.
- When the underground cabling is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.

- A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of 1.2m, within which the ducting will be laid.
- The cable ducting will be concrete surrounded where they pass under the public road and under drains or culverts.
- Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse.
- Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required.
- The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up from the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.
- As the works progress, the as-built location of the ducting will be recorded using a total station or GPS.
- As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting.
- Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- The remainder of the trench will be backfilled in two compacted layers with approved engineer's specified material.
- Yellow marker warning tape will be installed across the width of the trench, at 300mm depth,
- The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Project.
- Marker posts will then be placed at regular intervals (generally at joint bays and any change in direction) to denote the location of the underground cabling.

2.3.4.2 Existing Underground Services

Any underground services encountered along the Proposed Grid Connection 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.

Where the Proposed Grid Connection interacts with existing underground services, e.g. the GNI network, the service crossings will be constructed in accordance with best practice information from the relevant entities supplemented by detailed engineering design. The Applicant will hold consultation with the relevant entities prior to the commencement of works along the Proposed Grid Connection.

2.3.4.3 Joint Bays

Joint bays are typically 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 typically 2.03m x 4.5m 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 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. 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 onsite 38kV substation and the existing Cashla 220kV substation. Earth Sheath Link Chambers are also required approximately every second joint bay along the Proposed Grid Connection. Communication Chambers will typically be pre-cast concrete structures with an access cover at finished surface level. The locations of the joint bays and chambers are shown in Appendix 4-1.

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

2.3.4.4 Underground Cabling Watercourse/Culvert/Service Crossings

A total of 10 no. existing watercourse crossings will be traversed along the Proposed Grid Connection route. The locations of the watercourse crossings are shown on the detailed layout drawings in Appendix 4-1 and details of each crossing location are presented in Table 4-5 in Chapter 4 of the EIAR. The watercourse crossing methodologies at these locations is set out in Figure 4-31 in Chapter 4 of the EIAR, with proposed crossing methodology illustrated on Figure 4-32 to Figure 4-35 in Chapter 4, with the most appropriated option being selected for each crossing. Instream works are not required at any watercourse crossing along the Proposed Grid Connection.

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

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

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 4-32 in Chapter 4 for further details.

2.3.4.4.2 *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 4-33 in Chapter 4 for further details.

2.3.4.4.3 *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 4-34 in Chapter 4 for further details.

2.3.4.4.4 *Horizontal Directional Drilling – Type D*

The HDD method of duct installation is carried out using Vermeer D36 x 50 Directional Drill (approximately 22 tonnes), or similar plant. The launch and reception pits will be approximately 2.5mm wide, 2.5m long and 2.0m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator will commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore will continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring, as listed below, will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits.

- The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;
- One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids shall be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush

Please see an illustration of the HDD methodology in Figure 4-35 in Chapter 4 for further details.

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, Natura Impact Statement (NIS) and all other relevant planning documents. The following sections give an overview of the drainage design principles, dust and noise control measures and a waste management plan for the 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 Chapter 4, Section 4.6 of the EIAR in addition to the drainage design and management for the Proposed Project. The protection of the watercourses within and surrounding the Site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the Site. No routes of any natural drainage features will be altered as part of the Proposed Project. The Proposed Project has where possible, been kept a minimum of 50 metres from natural watercourses. There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from watercourses.

Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.

Existing artificial drains in the vicinity of existing Proposed Wind Farm roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

A detailed drainage design for the Proposed Project will be prepared prior to the commencement of construction to by the Project Hydrologist 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

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 farm 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:

- Forestry Commission (2011): Forests and Water UK Forestry Standard Guidelines, Fifth Edition. Publ. Forestry Commission, Edinburgh;
- 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 (EPA, 2022);
- 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 Guidelines (DoEHLG, 2006)) and the Draft Revised Wind Energy Development Guidelines (the Draft Guidelines (DoEHLG, 2019);
- 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);
- 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 Plan 2018-2021 (DAFM, 2018).

3.2.4 Site Drainage Design and Management

The proposed site drainage features for this Site are outlined in Section 4.6 of the EIAR. As this CEMP is a working document and is presented as an Appendix to the EIAR, the drainage measures are not included in this document. When the final CEMP report is prepared, and presented as a standalone document, all drainage measures will be included in that document. These drainage proposals will be developed further prior to the commencement of construction as part of the detailed drainage design.

The following sections give an outline of drainage management arrangements in terms of pre-construction, construction, operational and decommissioning phases of the Proposed Project.

3.2.4.1 Pre-Construction Drainage

Prior to commencement of works in sub-catchments across the Site, main drain inspections will be competed 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.

Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.

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. There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from watercourses. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings.

Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.

Existing artificial drains in the vicinity of existing Proposed Wind Farm roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

3.2.4.2 Construction Phase Drainage

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 as diffuse overland flow or for rewetting of land.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land.
- No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses.
- Where possible, maintain 50-metre watercourse buffer zones for the wind turbines.
- No alteration of natural watercourses.
- Maintain the existing hydrology of the Site.
- Blocking of existing manmade drainage as appropriate.
- Daily inspection and recording of surface water management system by on-site Environmental Clerk of Works 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.
- Use of siltbuster or equivalent system if required.

Runoff control and drainage management are key elements in terms of mitigation against impacts on surface water bodies. Two distinct methods will be employed to manage drainage water within the Site. The first method involves 'keeping clean water clean' by avoiding 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. The second method involves collecting any drainage waters from works areas within the Site that might carry silt or sediment, and nutrients, to route them towards new proposed silt traps and settlement ponds (or stilling ponds) prior to controlled diffuse release into the existing drainage network. There will be no direct discharges to the existing hydrological features (forestry and agricultural drains or natural watercourses).

The Proposed Drainage Design is included as Appendix 4-3 of the EIAR.

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 4.6 of the EIAR. The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be excavated, and settlement ponds constructed to eliminate any suspended solids within surface water running off the Site.

Drainage infrastructure within the Proposed Wind Farm site will include:

- Source controls:
  - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.
  - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas.
- In-Line controls:
  - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems:
  - Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems.

It should be noted that within the Proposed Wind Farm site, an extensive network of forestry, peat and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

The main elements of interaction with existing drains will be as follows:

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm site drainage into the existing site drainage network. This will

reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;

- Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;
- Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces;
- Buffered outfalls which will be numerous over the Proposed Wind Farm site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site; and,
- Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.

The majority of the Proposed Grid Connection is >50m from any nearby watercourse, sections within 50m of the Proposed Grid Connection are confined to existing watercourse crossings at bridges and culverts. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils.

There is a total of 10 no. watercourse crossings (4 no. crossings over EPA mapped watercourses and 6 no. additional crossings over watercourses which are not included in the EPA database) along the Proposed Grid Connection. All the crossings are existing bridges and culverts along the public road.

Setbacks 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 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;

All of the Proposed Project works will be supervised by the Environmental Clerk of Works (ECoW) supported by the Project Hydrologist.

Best practice and practical experience on other similar projects suggests that in addition to the drainage plans that are included in the EIAR, there are additional site-based decisions and plans that can only be made in the field through interaction between the Site Construction Manager, the Project Hydrologist and the Project Geotechnical Engineers. Further details on Roles and Responsibilities are outlined within Section 4.1 of this CEMP.

In relation to decisions that are made on site it is important to stress that these will be implemented in line with the associated drainage controls and mitigation measures outlined in Section 7 of this CEMP, and to ensure protection of all watercourses.

The Project Hydrologist/Design Engineer will complete a site drainage 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 Chapter 4, Section 4.6 of the EIAR. The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be

excavated, and stilling ponds constructed to eliminate any suspended solids within surface water running off the Site.

3.2.4.3 Operational Phase Drainage

The Project Hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. This operational phase drainage system will have been installed during the construction phase in conjunction with the road and hardstanding construction work as described in Section 2.3.3.2 and Section 2.3.3.4 above and in Section 4.6 of the EIAR.

The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.

The drainage system will not be altered upon decommissioning. Measures which will be implemented to ensure no impacts upon the drainage system during decommissioning will be outlined within the Decommissioning Plan (Appendix 4-6 to the EIAR) and fully agreed with the local authority prior to any decommissioning works.

3.2.4.4 Preparative Site Drainage Management

The detailed drainage design will specify all materials and equipment necessary to implement the drainage measures effectively, which will be brought on site in advance of any works commencing.

An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.

3.2.4.5 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. 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.

3.2.4.6 Reactive Site Drainage Management

In line with the requirements of the EIAR, 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 or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the 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 or supervising hydrologist 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.

3.2.4.7 Cable Trench Drainage

Cable trenches are typically 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.

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 transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site. Along sections of the Proposed Grid Connection underground cabling route that are further removed from the Proposed Wind Farm site it may be more practical to transport excess excavated material to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Section 4.6.4.12 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.

3.2.4.8 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 Attymon, Co. Galway.

https://www.yr.no/en/forecast/daily-table/2-2966832/Ireland/Connacht/County%20Galway/Attymon

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 site, ideally via an automated rain gauge 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.

3.2.5 Refuelling, Fuel and Hazardous Materials Storage

Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use.

All refuelling will be carried out outside designated watercourse buffer zones. Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

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

- Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles.
- All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site.
- On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site.
- Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis.
- Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use
- Only designated trained operatives will be authorised to refuel plant on-site;
- Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones;
- Fuels stored on the Proposed Wind Farm site will be minimised;
- Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and,
- An emergency plan for the construction phase to deal with accidental spillages will be contained within Section 6.1.4 below. Spill kits will be available to deal with accidental spillages

3.2.6 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.

The following mitigation measures are proposed to avoid release of cement leachate from the Site:

- No batching of wet-concrete 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;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. 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 undertaken at lined concrete washout ponds;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and,
- At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. 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 will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. 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 below in Plate 3-1.

Plate 3-1 Typical concrete wash out areas

3.2.7 Tree Felling Drainage Measures

As discussed in Section 2.3.3.11 above, tree felling will be required within and around Proposed Project footprint to allow for the construction of the proposed turbines, access roads, underground cabling, and the other ancillary infrastructure. The felling will not be undertaken simultaneously with construction groundworks. Keyhole felling to facilitate construction works will take place prior to groundworks commencing. A Harvest Management Plan is included as Appendix 4-4.

During tree felling 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, however mitigation is provided in Chapter 9 Water with regard surface water quality protection for this activity which is summarised below. Also, prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:

- All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;
- Clean water interceptor drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the keyhole and extraction works. The ECoW shall be experienced and competent, and shall have the following functions and operate their record using a Schedule of Works Operation Record (SOWOR), as proposed in the planning application:

- Attend the Site for the setup period when drainage protection works are being installed and be present onsite during the remainder of the forestry keyhole felling works.
- Prior to the commencement of works, review and agreement of 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 Tool Box 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 Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements.
- 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:
- Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations.
- Sampling shall be taken from the stream / riverbank, with no in-stream access permitted.
- The following minimum analytical suite shall be used: pH, EC, TSS, BOD, Total P, Ortho-P, 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.
- Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.

To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities.

- All relevant measures, best practice methods and requirements set out in Chapter 9 of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines.
- 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 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 they 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 spoil repository 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 onsite 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;
- All refuelling will be completed outside of the designated 50m hydrological buffer zones. 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.

Table 3-1 Minimum Buffer Zone Widths (Forest Service, 2000)

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

3.3 Archaeological Management

This section of the CEMP provides an outline of the mitigation measures outlined in Chapter 14 Archaeological, Architectural and Cultural Heritage of the EIAR for the construction phase of the Proposed Project.

There are no UNESCO World Heritage Sites or National Monuments located within or along the proposed footprint of the Proposed Project.

Three National Monuments in State Care are located within 10km of the proposed turbines. The closest is the Turoe Stone (GA097-152; NM No. 327), situated c. 6.5km to the south of the proposed turbines (T08). However, this monument has been removed from its recorded position and is currently held by the Office of Public Works. A settlement cluster (GA084-086; NM No. 642) is located c. 7.5km to the west of the proposed turbines (T01), and Athenry Castle (GA084-001006; NM No. 406) is located c. 9.7km west-southwest of the proposed turbines (T01).

There are two recorded Archaeological Heritage sites (AH sites) within the Proposed Wind Farm. These are both ringforts (RMP no. GA085-045 i.e., AH97 as per Table 1-1 in Appendix 14-2; and RMP no. GA085-047, i.e., AH98 as per Table 1-1 in Appendix 14-2), located 365m to the south of the nearest proposed turbine (T07) and 266m to the northeast of the nearest proposed turbine (T08), respectively. There are a further 121 no. archaeological sites, or groups of sites, within the 5km study area (of the proposed turbines), 7 no. of which include redundant records.

There are 28 no. recorded structures of architectural merit within the 5km study area of the proposed turbines, including 22 no. protected structures. Additionally, 28 no. previously unrecorded sites of cultural heritage significance have been identified within the 2km study area of the proposed turbines as part of this assessment.

Of the identified archaeological sites, or groups of sites, 4 no. are located within 50m of the Proposed Grid Connection, along with 5 no. built heritage sites and 15 no. previously unidentified sites of cultural heritage significance.

Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the accessible locations of proposed turbine hardstands, temporary construction compounds, onsite substation and along the access roads and greenfield section of the Proposed Grid Connection. Archaeological test trenching will be carried out under licence to the National Monuments Service of the DoHPLG, and will permit the identification of previously unknown sub-surface archaeological features. This may be followed by further mitigation, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHPLG. These mitigation measures will ensure that previously unrecorded archaeological features are appropriately recorded and/or preserved in advance of construction commencing, mitigating the potential effects of the Proposed Project.

A large portion of the Proposed Wind Farm is dominated by peat and forestry, which is not suitable for archaeological test trenching. Archaeological monitoring of topsoil stripping will be carried out at these locations, including lands adjacent to watercourses. This work will be carried out under licence to the National Monuments Service of the DoHPLG. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHPLG.

Where direct effects have been identified to townland boundaries as part of the construction of the Proposed Project, works will be subject to archaeological monitoring, to include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DoHPLG.

All excavations as part of the Proposed Grid Connection within the Zone of Notification of AH15 (Record of Monuments and Places (RMP) No.'s.: GA084-043001; GA084-043002; GA084-043003) will be monitored under licence. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH.

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 Traffic Management Plan 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 Wind Farm

The Port of Galway has been selected and assessed to facilitate turbine delivery to the Proposed Wind Farm site. It is proposed that large wind turbine components will be delivered to the Proposed Wind Farm site, from Galway Port, north through Galway city via the L5048 Lough Atalia Road. After approximately 1.6km on the L5048 Lough Atalia Road, the turbine delivery vehicles will turn right onto the R338 Dublin Road and travel approximately 1.8km southeast before turning north onto the R865 Ballybane Road. After travelling north for 1.3km on the R865 Ballybane Road, the turbines will turn right onto the N6 National Road and travelling east 6.6km before merging onto the M6 Motorway. The turbine delivery vehicles will travel east on the M6 for approximately 11.2km before exiting at Junction 17 to Athenry/Craughwell. After exiting the M6 the turbines will travel north for 1.3km along the R348 regional road before turning south and traveling in a southeastern direction for 9.2km along the R348

regional road. The turbine delivery vehicles will then turn left onto the L3115 local road and travel north for approximately 5.2km to the proposed new site entrance which will facilitate abnormal load delivery (further detailed in Chapter 4, Section 4.5).

General construction deliveries and staff will access the Proposed Wind Farm site via the proposed new construction and operational entrance on the L-3115 at the west of the Proposed Wind Farm site as described in Section 4.5.1 of the EIAR. As set out in Chapter 15, Section 15.1.2.3, based on the location of potential suppliers of concrete and crushed stone, there are 3 additional routes (the R347 which links into Athenry from the west, the R348 which connects into Athenry from the north, and the R349 that joins the TDR from the south) that may be used for the delivery of these materials. Transportation of large turbine components will be carried out at night when traffic is at its lightest and in consultation with the relevant Roads Authorities and An Garda Síochána with deliveries accompanied by Garda escort.

3.4.1.2 Proposed Grid Connection

It is proposed to connect the onsite 38kV substation to the existing 220kV Cashla substation in the townland of Barrettspark, Co Galway via 38kV underground electrical cabling. The underground electrical cabling route is illustrated in Figure 2-2 above in Section 2.2, is approximately 21.8km in length and located primarily within the public road corridor, with three subsections (approximately 0.2km, 0.6km and 1.5km respectively) located in private land/existing track.

The underground electrical cabling route will originate at the proposed onsite 38kV substation and travel 0.2m out the Proposed Wind Farm site via the proposed site entrance. It will turn right out of the proposed site entrance and travel north on the L3115 for approximately 0.5km before turning left onto the L7152 south of the Attymon National School. The underground electrical cabling route will travel west on the L7152 for approximately 7km before turning left and travelling west on the L3111 for 1.6km where it turns right and travels north on the L3107 for 0.1km and then turns left and travels west on the L7126 for approximately 2.4km. The underground electrical cabling route will then turn right onto the R347 for approximately 1.4km. The underground cabling route will then turn left off the R347 onto the L7122 and travel for approximately 1.3km before entering private land. The underground electrical cabling will travel through private land for 0.6km before exiting onto the L31030 and travelling in a southwest direction for 1.5km. the route will then turn left onto the L3103 for 0.1km and then turn right onto the L7108. On the L7108, the route will stay to the left when the road splits after 0.2km and travel for 2km to the second section of private land. After 1.5km the underground electrical cabling route will exit private land and turn left onto the L7109 and travel north for 1.5km before entering the existing Cashla 220kV substation.

The underground electrical cabling route is illustrated in Figure 2-2 above in Section 2.2. The cross section of the 38kV underground cabling trench is shown in Figure 4-20 in Chapter 4. The construction methodology for the Proposed Grid Connection is outlined in Section 2.3.4.1 above.

Deliveries of materials for the construction of the Proposed Grid Connection infrastructure and underground cabling route will be via the public road network along the identified route. The proposed works will be rolling in nature; approximately 100-150m will be constructed along the road network at any one time.

With respect to the traffic volumes that will be generated during the construction of the Proposed Grid Connection, it is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 8 return trips made by a car to transport construction staff, to and from the Site.

The construction methodology of providing a Proposed Grid Connection underground cabling route under and along local road networks is well established and accepted nationwide. There are in excess of 300 wind farms currently operational in Ireland and the majority of these are connected to the national grid via underground cabling connections predominantly along the public road networks.

Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified, as detailed in Section 4.8.2.4 of the EIAR. All relevant bodies i.e., ESBN, Galway County Council, GNI etc. will be contacted and all up to date information for all existing services sought. Structural bridge surveys will be carried out and the current proposals will be subject to detailed design prior to construction. HDD launch and reception pits at locations along the Proposed Grid Connection underground cabling route will be determined following site investigations.

When the Proposed Grid Connection underground cabling route is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.

3.4.2 Traffic Mitigation Measures During the Construction Stage

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.

A detailed Traffic Management Plan (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 roads 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 development, 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 Galway County Council in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities, TII and MMaRC and 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 Site.
- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or 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 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 can 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.
- **Diversion routes during grid construction –** The identification and agreement with suitable diversion routes during the construction of the Proposed Grid Connection.
- **Liaison with the relevant local authority** - Liaison with Galway 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 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 15.1.9. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable.
- **Identification of delivery routes** – These routes will be agreed with Galway County Council and adhered to by all contractors.
- **Delivery times of large turbine components** - The TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.
- **Travel plan for construction workers –** While the assessment above has assumed the worst case in that construction workers will drive to the 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 an area for parking.
- **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4-5.
- **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 haul route.

In periods of extended dry weather, dust suppression may be necessary within the Proposed Wind Farm site, along haul roads and along the public road corridor, proposed new roads in private agricultural land, and proposed upgrades to existing private track associated with the Proposed Grid Connection underground cabling route to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Site's drainage system and will be pumped into a bowser or water spreader to dampen down the relevant areas to prevent the generation of dust. Silty or oily water will not be used for dust suppression, as this would 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.

Proposed measures to control dust include:

- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff.
- All plant and materials vehicles shall be stored in dedicated areas within the Site.
- Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas.

- Turbines and construction traffic will be transported to the Site on specified haul routes only.
- The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.
- The roads adjacent to the Proposed Wind Farm site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary.
- The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary.
- If necessary, excavated material will be dampened prior to transport to the spoil management areas.
- Approximately 5 dust monitoring gauges will be deployed across the Proposed Wind Farm site to detect any exceedances of acceptable dust levels.
- 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 Proposed Project to reduce the amount of emissions associated with vehicle movement.
- A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures.
- Groundworks (i.e., works with potential to create dust) associated with proposed turbines T01, T03, and T08 will be fully supervised by an ECoW.
- Groundworks (works with potential to produce dust) at proposed turbines T01, T03, and T08 will be restricted to the marsh fritillary hibernation season (October to January inclusive) as larvae will be under vegetation and within hibernation webs which will act as a natural shield.
- The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with all proposed mitigation as set out in above.
- If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work.
- The ECoW will have power to halt construction works if required as outlined above.

When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic 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 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.

Section 8 of BS5228-1:2009+A1:2014 as outlined in Chapter 12 (Noise & Vibration) of the EIAR, 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.
- During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 12-1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. 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.

An assessment of the operation noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section 12.3.2.2.1 of the EIAR. The findings of the assessment confirmed that the predicted operational noise levels will be within the relevant best practice noise criteria curves for wind farms at all locations.

In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Proposed Project, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) *Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise* (9 August 2016) (IOA AMWG) or subsequent revisions. Please see Section 12.6.2.1.1 of the EIAR for further details.

3.7 Invasive Species Management

A baseline invasive species survey was carried out at the 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) by a suitably qualified ecologist. As outlined in Chapter 6 of the EIAR, one record of *Rhododendron ponticum* was found within wet grassland within the east of the EIAR site boundary at ITM 562076 729531, however this is completely avoided by the Proposed Project.

In the event that the presence of such species is found at or adjacent to the Proposed Project development footprint during pre-commencement surveys, particularly in areas where its excavation may be required, an Invasive Species Management Plan will be prepared for the Site to prevent the introduction or spread of any invasive species within the footprint of the works. An Invasive Species Management Plan, if required, will set out best practice control methods as summarised in the following sections. The Invasive Species Management Plan would be updated during construction.

3.7.1 Site Management

Careful preparation and planning of the works is crucial to successful treatment of invasive species. The following list of guidelines, 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 Site must be amended by an appropriately qualified person to mitigate against the risk.

3.7.2 Establish Good Site Hygiene

The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works:

- A risk assessment and method statement will be provided by the Contractor prior to commencing works.
- Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.
- Stockpile areas will be chosen to minimise movement of contaminated soil.
- Stockpiles will be marked and isolated.
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.
- An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans.

Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.
- Decontamination will only occur within designated wash-down areas.
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches.
- All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.

3.8 Waste Management

This section of the CEMP provides a waste management plan (WMP) which outlines the best practice procedures during the excavation and construction phases of the project. The WMP 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 Site to ensure that all contractors hired to remove waste from the 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 Department of the Environment provides a document entitled, *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'* (2021). It is important to emphasise that no demolition will take place at this Site, however, this document was referred to throughout the process of completing this WMP.

3.8.2 Waste Management Hierarchy

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

Prevention and Minimisation:

The primary aim of the WMP 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 WMP, 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 turbines and meteorological mast will be manufactured off-site and delivered to the Proposed Wind Farm site where on site erection will occur.

The turbine and meteorological mast 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 from local quarries. The onsite electrical 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 (Proposed Grid Connection and Proposed Wind Farm) 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 the Proposed Grid Connection underground cabling route	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 the 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 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 a single waste skip. This waste material will be transferred to a 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 waste generated from the 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 site 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 skip. 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 site 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 development 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 have to be disposed of:

- Concrete can be reused as aggregate for roads or 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 the on-site skip 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 waste management plan. 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 WMP 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 WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the Site will be required to provide documented records for all waste dispatches leaving the 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 Waste Management Plan Conclusion

The WMP 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 WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP 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 Environmental Clerk of Works (ECoW) 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 ECoW 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 ECoW 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 ECoW 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 ECoW will also have to call upon the Project Ecologist, Project Hydrologist, 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.

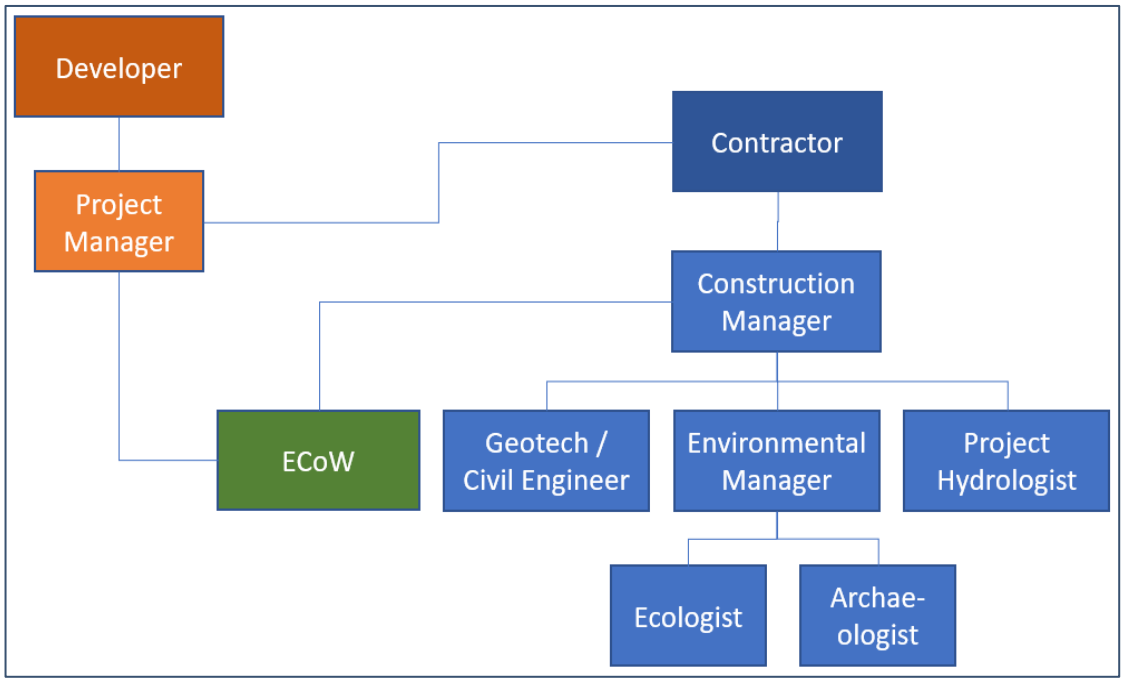

Figure 4-1 Proposed Project Organogram

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 a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW 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 ECoW 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 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 ECoW 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 ECoW.

The level, detail and frequency of reporting expected from the ECoW 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 Ecologies/Ornithologist

The Project Ecologist/ Ornithologist will be available to support the ECoW 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:

- 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 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 ECoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design by the Project Contractor. The Project Hydrologist will not be full time on site 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 ECoW 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 ECoW 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/ECoW and is responsible for archaeological monitoring of the 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.

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 full time on site 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

Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site.

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 9-6 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.

4.2.2 Construction Phase Monitoring

4.2.2.1 Daily Visual Inspections

An inspection and maintenance plan for the on-site construction 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 and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs should be undertaken for each primary watercourse along the Proposed Grid Connection underground cabling route 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.

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 ECoW or a suitably qualified and competent person as delegated by the ECoW;
- 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 ECoW 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/ ECoW during construction phase;
- Quarterly site inspections by the Project Hydrologist/ ECoW 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 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 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 renewable energy development site with further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs should be undertaken for each primary watercourse along the Proposed Grid Connection underground cabling route and specifically following heavy rainfall events (i.e. weekly, monthly and event based).

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 water monitoring programme for the Proposed Project and each primary watercourse along the Proposed Grid Connection underground cabling route. These analyses will be carried out by either the ECoW or the Project Hydrologist. 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 & 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 ECoW 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 ECoW will notify the contractor, the developer and project design team including the Project Hydrologist. The ECoW'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 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 ECoW 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 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 would be held by the ECoW 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 Ecological Sensitivities;
- Buffers to be upheld – watercourses, archaeology, ecology;
- Sediment and Erosion Control;
- Good site practice;
- On-site Traffic Routes and Rules;
- 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 is 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'*. This will encompass the use of all necessary Personal Protective Equipment and adherence to 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 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
- Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).

The following measures below are also detailed in Chapter 18 Schedule of Mitigation and outlined in Table 7-1 and 8-1 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 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 Site where uncontrolled access is not permitted.
- 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 will be made aware of the location of overhead electricity 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
- 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 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'*. 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 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 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 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.

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 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.

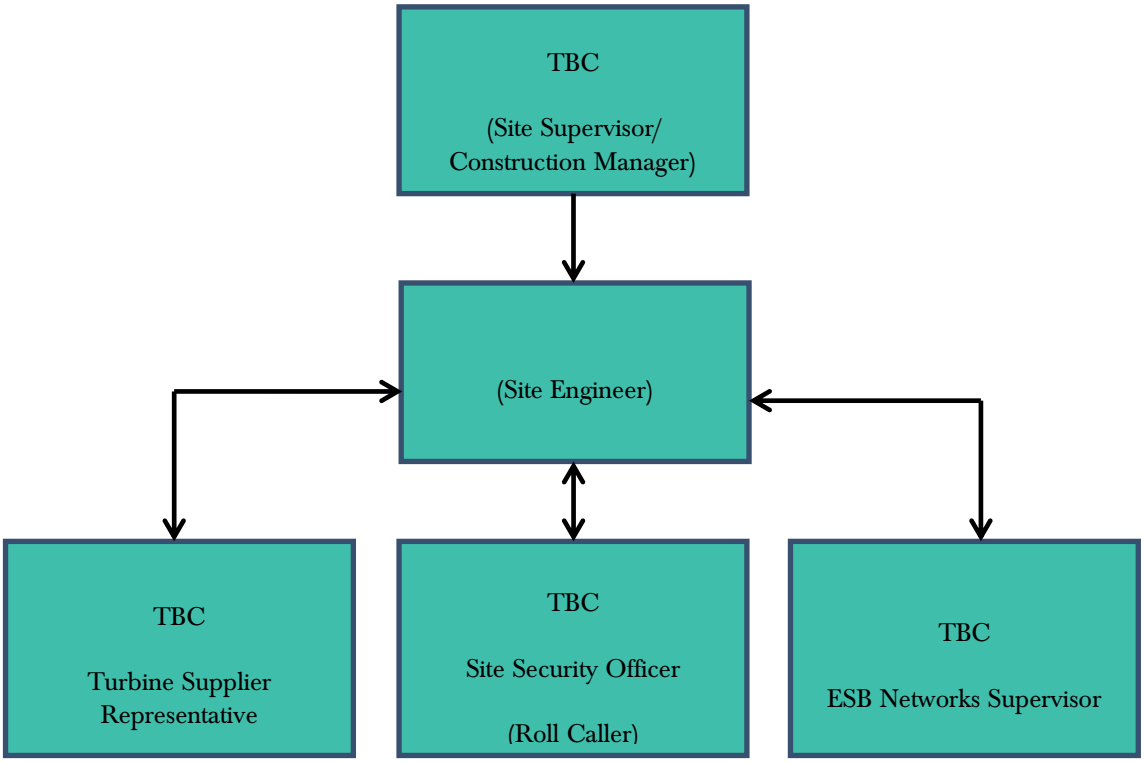

Figure 6-1 Emergency Response Procedure Chain of Command

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:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.
- Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the 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 Site should proceed, without exception. The Site evacuation procedure is outlined in Section 6.1.3.
- 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.
- 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.
- 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.

- Contact any regulatory body or service provider as required e.g. ESB Networks the numbers for which as provided in Section 6.3.
- 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:

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

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

6.1.4 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the Proposed Project. Oil/fuel spillages are one of the main environmental risks that will exist on the 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. The following steps provide the procedure to be followed in the event of such an incident:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- 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.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the 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.
- The Construction Manager will notify the appropriate regulatory body such as Galway 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.

- The ECoW must be immediately notified.
- If necessary, the Construction Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- 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.
- 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 ECoW will liaise with the Project Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the ECoW will liaise with the Project Archaeologist.

A record of all environmental incidents will be kept on file by the ECoW and the Project Contractor. These records will be made available to the relevant authorities such as Galway County Council, IFI, NPWS, etc. if required. The ECoW 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 Project 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.

Due to the remoteness of the Site it may be necessary to liaise with 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.

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
Doctor – Athenry Primary Care Centre	091 737 300
Hospital – University Hospital Galway – Galway City	091 524 222
ESB Emergency Services	1800 372 999
Gas Networks Ireland Emergency	1800 20 50 50
Gardaí – Athenry Garda Station	091 184 4016
Health and Safety Co-ordinator - Health & Safety Services	TBC
Health and Safety Authority	0818 289 389
Inland Fisheries Ireland (IFI)	0818 347 424
Project Supervisor Construction Stage (PSCS): TBC	TBC
Project Supervisor Design Stage (PSDS): TBC	TBC
Client: Gannow Ltd.	021 733 6034

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 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, construction and operational phases of the Proposed Project are set out in the various sections of the Environmental Impact Assessment Report (EIAR), NIS prepared as part of the planning application to Galway County Council.

This section of the CEMP groups together all of the mitigation measures presented in the above sections. The Mitigation Measures are presented in the following pages and are also outlined within Chapter 18: Schedule of Mitigation and Monitoring Measures. Decommissioning Phase mitigation measures are not included in the table below, however, can be viewed in Appendix 4-6 (Decommissioning Plan) of the EIAR.

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. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4: Description of the Proposed Project					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Chapter 4	› All proposed activities on the Site will be provided for in a Construction and Environmental Management Plan (CEMP). A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. › The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, spoil management and waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR and NIS. The contractor will be contractually obliged to comply with all such measures. In the event 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	CEMP Section 4	› The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW 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 onsite. › The ECoW 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 ECoW 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 ECoW 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 level, detail and frequency of reporting expected from the ECoW 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	CEMP Section 4 EIAR Chapter 9	› Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. › 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 9-6 of Chapter 9 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.		
MM4	Concrete Deliveries	EIAR Chapter 4 CEMP Section 3	› The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures. › Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. › Before leaving the site, washing of the delivery truck will be minimised and restricted to designated wash out areas. Wash out will be restricted to the concrete lorry's chute only.		
MM5	Site Drainage Plan	EIAR Chapter 4 CEMP Section 3	› 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 4.6 of the EIAR. › Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Section 3 of the CEMP.		

			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 as diffuse overland flow or for rewetting of land. › Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land. › No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses. › Where possible, maintain 50-metre watercourse buffer zones for the wind turbines. › No alteration of natural watercourses. › Maintain the existing hydrology of the Site. › Blocking of existing manmade drainage as appropriate. › Daily inspection and recording of surface water management system by on-site Environmental Clerk of Works 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.		
MM6	Preparative Site Drainage Management	EIAR Chapter 4 CEMP Section 3	› Drains will be excavated, and silting ponds constructed to eliminate any suspended solids within surface water running off the Site. › An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.		
MM7	Drainage Inspection	EIAR Chapter 4, 9 CEMP Section 3	› Prior to commencement of works in sub-catchments across the 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.		

MM8	Watercourse Inspection	EIAR Chapter 4 CEMP Section 2	› Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM9	Drainage Maintenance	CEMP Section 4 EIAR Chapter 9	› 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.		
MM10	Earthworks	CEMP Section 3	› Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible, drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.		
MM11	Felling	EIAR Chapter 4 Appendix 4-4 CEMP Section 3	› Before the commencement of any felling works, an experienced and competent ECoW shall be appointed to oversee the keyhole and extraction works. › Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing, water crossings and on-site storage facilities for fuel, oil and chemicals will be carried out by the ECoW. › Before the commencement of felling all operators will be fully briefed on the harvest plan including potential hazards and environmental sensitivities and corresponding protective measures on site. › Advance notice and safety signage will be erected prior to harvesting, and harvest boundaries will be clearly marked before operations begin.		

MM12	Felling Drainage Management	EIAR Chapter 4 CEMP Section 3	Prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed: › All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps. › Clean water diversion drains will be installed upgradient of the works areas. › Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains. › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
MM13	Felling Licence	EIAR Chapter 4 CEMP Section 2	› Felling will be carried out under the terms of a licence application to the Forest Service, as per the Forest Service's policy on granting felling licenses for wind farm developments. › The Forest Service's policy on granting felling licenses for wind farm developments requires that a copy of the planning permission for the Proposed Wind Farm be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Project.		
MM14	Traffic Management	EIAR Chapter 4, 15 CEMP Section 3	› A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out within the CEMP along with Chapter 15 of the EIAR, will be finalised and detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on-site. › Prior to the Traffic Management Plan 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 Traffic Management Plan for agreement with the relevant Authorities. › Where the Proposed Grid Connection is located on public roads, a Traffic Management Plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and		

			general operatives will be inducted and informed as to the location of any services.		
MM15	Peat & Spoil Management	EIAR Chapter 4, 9 Appendix 4-2 CEMP Section 2	› An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. › Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level. › All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction.		
MM16	Proposed Grid Connection underground cabling works	EIAR Chapter 4 CEMP Section 2	› Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified. All relevant bodies i.e., ESBN, Galway County Council, GNI etc. will be contacted and all up to date information for all existing services sought.		
MM17	Waste Management	EIAR Chapter 4 CEMP Section 3	› 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 Waste Management Plan (WMP), 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					
MM18	Refuelling	EIAR Chapter 4, 8, 9 Appendix 4-3 CEMP Section 3	› Road-going vehicles will be refuelled off-site wherever possible. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. › All refuelling will be carried out outside designated watercourse buffer zones.		

			› Only designated trained and competent operatives will be authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. The following mitigation measures are proposed to avoid release of hydrocarbons at the Site: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck, that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use › Only designated trained operatives will be authorised to refuel plant on-site; › Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones; › Fuels stored on the Proposed Wind Farm site will be minimised; › Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (CEMP) (Appendix 4-5). Spill kits will be available to deal with accidental spillages.		
MM19	Concrete Based Products Deliveries and Management	EIAR Chapter 4, 9 CEMP Section 3	› No batching of wet-concrete 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; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. 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 undertaken at lined concrete washout ponds; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, › At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.		
MM20	Concrete Pouring	EIAR Chapter 4 Appendix 4-3	› 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 lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. › Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats. › Concrete pours will be managed and supervised to ensure there will be no leakage/ seepage/ discharge of concrete or concrete water during the construction phase. › Concrete wash water, and waste concrete will be managed appropriately on site at a lined concrete wash out pit.		
MM21	Road Cleanliness	EIAR Chapter 4 CEMP Section 3	› The Proposed Wind Farm roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. › A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project. › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.		

MM22	Watercourse Buffers	EIAR Chapter 4 Appendix 4-3 CEMP Section 3	› There will be no direct discharges to natural watercourses or drains. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from watercourses. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings. › Buffered outfalls, which will be numerous over the Proposed Wind Farm site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site.		
MM23	Water Discharge	Appendix 4-3 CEMP Section 3	› Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm Site drainage into the existing site drainage network where possible. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion. › Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area.		
MM24	Wastewater Management	EIAR Chapter 4, 9	› The temporary construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank. The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor.		
MM25	Drainage Swales	EIAR Chapter 4	› Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses.		

			› Drainage swales 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.		
MM26	Interceptor Drains	EIAR Chapter 4 Appendix 4-3 CEMP Section 3	› 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 Site where it might otherwise have come into contact with exposed surfaces and picked up 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. › The interceptor drains will be installed in advance of any main construction works commencing.		
MM27	Check Dams	EIAR Chapter 4 CEMP Section 3	› The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive.		
MM28	Level Spreaders	EIAR Chapter 4 Appendix 4-3	› A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the Site.		
MM29	Piped Slope Drains	EIAR Chapter 4 Appendix 4-3	› Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders.		
MM30	Vegetation Filters	EIAR Chapter 4 Appendix 4-3	› Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions.		

MM31	Stilling Ponds (Settlement Ponds)	EIAR Chapter 4, 9. Appendix 4-3 CEMP Section 3	› Stilling ponds will be used to attenuate runoff from works areas of the Proposed Project during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Project during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.		
MM32	Silt Bags	EIAR Chapter 4, 9 Appendix 4-3	› 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 of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site. › Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the 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 silt into the stream.		
MM33	Siltbuster	EIAR Chapter 4, 9 Appendix 4-3 CEMP Section 3	› Siltbusters or similar equivalent pieces of equipment will be available to filter any water pumped out of excavation areas if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. They are specifically designed for use on construction sites. › The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint onsite and making it highly mobile. › They will be used as final line of defence if needed.		

MM34	Culvert Crossings	EIAR Chapter 4, 9. CEMP Section 2	It is proposed to construct a clear-span watercourse crossing at the 2 no. locations where new watercourse crossings are required within the Proposed Wind Farm site. The locations of these crossings are shown on the layout drawings included in Appendix A-1 and Figure 4-31 in Chapter 4. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows: › 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. › All drainage measures along the proposed road will be installed in advance of the works. › 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 the stream bank with no instream works required. › 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. › 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. › Where the box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse, › Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations. › Underground cabling ducting will be contained within the road make-up of the proposed crossing.		
MM35	Clear-Span Watercourse Crossing	EIAR Chapter 4, 9. CEMP Section 2	› 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 have to 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 900m 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.		
MM36	Silt Fences	EIAR Chapter 4 Appendix 4-3 CEMP Section 2	› 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, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Project. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3. › 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 Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. › All silt fencing will be formed using Terrastop Premium or equivalent silt fence product. › Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.		
MM37	Sedimats	EIAR Chapter 4	› Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt		

		Appendix 4-3	bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.		
MM38	Hydrocarbon Interceptor	EIAR Chapter 4	› A hydrocarbon (or petrol) interceptor is a trap used to filter out hydrocarbons from surface water runoff. A suitably sized hydrocarbon interceptor will be installed wherever it is intended to store hydrocarbons and oils (i.e., construction compounds and substation compound) or where it is proposed to park vehicles during the construction and operational phases of the Proposed Project (i.e., construction compounds and substation compound).		
MM39	Proposed Grid Connection – existing services, joint bays and watercourse crossings	EIAR Chapter 4 CEMP Section 2	› Any underground services encountered along the Proposed Grid Connection 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 communications duct 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. › Where the Proposed Grid Connection underground cabling route interacts with existing underground services (i.e., the GNI network at 2 no. locations, M17 Motorway at 1 no. location, and the Irish Rail Galway-Dublin rail line at 1 no. location), the service crossings will be constructed in accordance with the relevant guidelines and best practice information from the relevant entity, i.e., GNI, Irish Rail, Transport Infrastructure Ireland. › The Applicant will hold consultation with the relevant entities prior to the commencement of works along the Proposed Grid Connection. › 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.		

			› The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to approval by ESBN. › The watercourse crossing methodologies, for the provision of the Proposed Grid Connection underground cabling route of the Proposed Project, is set out [in Section 4.8.2.8 of Chapter 4] with the most appropriated option being selected for each crossing location. Instream works are not required at any watercourse crossing along the Proposed Grid Connection. › The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility. › Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits.		
MM40	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 Appendix 4-3 CEMP Section 2	› 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 site with excavated peat and spoil being transported and stored in the identified peat and spoil management 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/met mast foundation. › Where (temporary) deep excavations are proposed, cut-off drains will be used to reduce the amount of surface water entering the excavation. This will be the case around turbine base excavations.		
MM41	Peat and Spoil Management	EIAR Chapter 4, 9 Appendix 4-2 CEMP Section 2	› Excavated peat will be placed/spread across the designated areas within the Proposed Wind Farm site. › The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat will be placed in the centre of the peat management areas with firmer spoil /drier peat placed around the outside. › The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works. › It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat. › Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. › 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 and spoil within the peat and spoil management areas. › Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site. › Supervision by the Project Geotechnical Engineer will be carried out for the works. › An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.		

MM42	Temporary Construction Compound	EIAR Chapter 4 CEMP Section 2	› Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. › There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank. › 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; › The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor. › The compound will be fenced and secured with locked gates if necessary.		
Operational Phase					
MM43	Wastewater Management	EIAR Chapter 4	› The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. › The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Project turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the substation underground storage tank.		
MM44	Electrical Substation	EIAR Chapter 4 CEMP Section 2	› The area of the on-site substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to one of the designated peat and spoil management areas. › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. › Perimeter fencing will be erected.		
EIAR Chapter 5: Population and Human Health					

Pre-Construction Phase					
MM48	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.		
MM49	Traffic and Transport	EIAR Chapter 5	› Prior to commencing Proposed Grid Connection works in the local road network in the townland of Barrettspark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. › Prior to commencement of any Proposed Grid Connection 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 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 › It is not anticipated that any section of the public road network will be closed during transport of turbines, although there will be some delays to local traffic at pinch points. During these periods it may be necessary to operate local diversions for through traffic. All deliveries comprising abnormally large loads where required will be made outside the normal peak traffic periods, usually at night, to avoid disruption to work and school-related traffic.		
Construction Phase					
MM50	Human Health	EIAR Chapter 5 CEMP Section 5	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 (Work at Height) Regulations 2006 (S.I. No. 318 of 2006). 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 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 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 Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Site will be made aware of the location of overhead electricity 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, 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 on Site. › The construction of the Proposed Grid Connection underground cabling will be in phases along the proposed route. Prior to commencing grid connection works in the local road network in the townland of Barrettspark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. › 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 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'*. 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 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 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 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.		
MM51	Air Quality: Dust Emissions	EIAR Chapter 5, 10 CEMP Section 3	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site.		

			› Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Site on specified haul routes only. › The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary. › The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Approximately 5 dust monitoring gauges will be deployed across the Proposed Wind Farm site to detect any exceedances of acceptable dust levels. › 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 Proposed Project to reduce the amount of emissions associated with vehicle movement. A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures.		
MM52	Air Quality: Exhaust Emissions	EIAR Chapter 5, 10	› Proposed Project 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 plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use. › Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All plant and materials vehicles shall be stored in dedicated areas (onsite).		

			› Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes 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 facility will be local to the Site to reduce the emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be sourced from local quarries. A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).		
MM53	Noise and Vibration	Chapter 5, 12	› 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. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 12-1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.*		

			The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. 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.		
			Operational Phase		
MM54	Property Values	EIAR Chapter 5	› The Proposed Wind Farm has been designed in accordance with the parameters set out in the Guidelines (DoEHLG, 2006) and with cognisance of the Draft Guidelines (DoHPLG, 2019).		
MM55	Human Health	EIAR Chapter 5	› Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. › Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. › Signs will also be erected at suitable locations across the Site as required for the ease and safety of operation of the wind farm. These signs include: ○ Buried cable route markers at 50m (maximum) intervals and change of cable route direction; ○ Directions to relevant turbines at junctions; ○ "No access to Unauthorised Personnel" at appropriate locations; ○ Speed limits signs at Site entrance and junctions; ○ "Warning these Premises are alarmed" at appropriate locations; ○ "Danger HV" at appropriate locations; ○ "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at Site entrance; ○ "No unauthorised vehicles beyond this point" at specific Site entrances; and ○ Other operational signage required as per Site-specific hazards.		

			› The proposed onsite 38kV substation, which will be operated by ESBN will be locked and fenced off from public access. The substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. › Periodic service and maintenance work which include some vehicle movement. › For operational and inspection purposes, substation access is required. › 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 and daily visits as required. › An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the Site. Access for emergency services will be available at all times.		
MM56	Shadow Flicker	EIAR Chapter 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the 82 no. sensitive receptors identified above, a site visit will be undertaken firstly to determine the presence of existing screening and window orientation at each potentially affected property. This will determine if the receptor has an actual line of sight to any turbine and actual potential for shadow flicker to occur. Once this exercise is completed and all of the potentially affected properties, the following measures will be employed. <u>Screening Measures</u> In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation; › Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation.		

			If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator. Wind Turbine Control Measures If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed above, wind turbine control measures will be implemented. Wind turbines can be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the wind farm. The shadow flicker control units will be added to any required turbines. › A shadow flicker control unit allows a wind turbine to be programmed and controlled using the wind farm's Supervisory Control and Data Acquisition (SCADA) system to change a particular turbine's operating mode during certain conditions or times or even turn the turbine off if necessary.		
EIAR Chapter 6: Biodiversity					
Pre-Construction Phase					
MM58	Invasive Species Management	EIAR Chapter 6 CEMP Section 3	A baseline invasive species survey was carried out at the 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) by a suitably qualified ecologist. As outlined in Chapter 6 of the EIAR, one record of *Rhododendron ponticum* was found within wet grassland within the east of the EIAR site boundary at ITM 562076 729531, however this is completely avoided by the Proposed Project. In the event that the presence of such species is found at or adjacent to the Proposed Project development footprint during pre-commencement surveys, particularly in areas where its excavation may be required, an Invasive Species Management Plan will be prepared for the Site to prevent the introduction or spread of any invasive species within the footprint of the works. An Invasive Species Management Plan, if required,		

			will set out best practice control methods as summarised in the following sections. The Invasive Species Management Plan would be updated during construction.		
MM59	Fauna	EIAR Chapter 6	**Marsh Fritillary:** Construction works will occur in close proximity to identified marsh fritillary-populations at T01, T03, T05 and T08 and along the proposed new road to T02. In addition, scrub clearance within the proposed bat buffer for Turbines T05 and T08 will be required in proximity to existing confirmed breeding sites. The following mitigations will be applied at these construction locations: › A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year in advance of construction throughout footprint areas of the Proposed Wind Farm › If active larval webs are recorded within the construction footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the construction footprint. 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 would only be translocated by the ECoW to existing breeding areas as shown in Appendix 6-5. › Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres near T01, T03, T05 and T08. › ECoW supervision will be required for construction of components near existing breeding areas (such as Turbines T01, T03, T05, T08 and along the proposed new road to T02). › Where suitable marsh fritillary habitat occurs in close proximity to Proposed Wind Farm infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. › No clearance of scrub within the proposed bat buffer of Turbines T05 or T08 will be carried out until sufficient exclusion zone fencing to a minimum of 5m is in place, or unless under ECoW supervision. The following mitigation applies to construction areas within 20m of recorded marsh fritillary larval webs (in line with Table 4 of Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction 2024):		

			› Groundworks (i.e works with potential to create dust) associated with proposed Turbines T01, T03, T05 and T08 and along the proposed new road to T02 will be fully supervised by an ECoW. › The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with the mitigations set out in Section 6.5.2.1.2 of the EIAR. › If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work. › The ECoW will have power to halt construction works if required as outlined above. › All of the additional dust mitigation measures outlined in Section 6.5.2.1.2 of the EIAR will apply. **Otter:** › A pre-commencement survey for otter will be undertaken along the Raford River and its tributary (the Killimor/ Attymon Beg River) within 150m upstream and downstream of the proposed new crossing structures in advance of commencement of works in order to confirm whether the baseline survey conditions remain the same. › If a holt is found within 150m of construction areas, the works will be undertaken in line with NRA guidelines and if a potential for disturbance is identified, these works will not be undertaken until a derogation licence is obtained. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of the survey will be to assess any changes in baseline conditions since the time of undertaking the baseline surveys. › The proposed 2 no water crossing structures will be pre-cast, clear-span structures and will therefore avoid any loss of riverbed or riverbank habitat). **Badger:**		

			› Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out in order to assess activity levels at setts and to identify any additional sett entrances that may have been established in the intervening period. › All setts within 50m of the Proposed Wind Farm infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. › All badger survey work will be undertaken in line with current best practice guidance. Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Wind Farm: › Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. › Construction works associated with the access road to Turbine T03 will be carried out over 30m away from the sett and the 30m exclusion zone will be fenced off to exclude potential access by construction workers. › Construction works associated with the access road to proposed Turbine T03 which is <50m from the sett will be undertaken outside of badger breeding season (January to June inclusive) if possible, unless in consultation with the NPWS with agreed additional mitigation in place. › All of the above works will be undertaken or supervised by an appropriately qualified ecologist in advance of construction. **Red Squirrel and Pine Marten:** Prior to the commencement of construction works, the following measures will be undertaken for the avoidance of disturbance and to ensure no dreys or dens have been established since the original surveys undertaken. The following measures are in line with *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA 2009).		

			› From a precautionary basis, a pre-commencement survey will be undertaken by a qualified ecologist in accordance with standard best practice guidance prior to the commencement of site works to ensure that no red squirrel dreys or pine marten dens are present within or in close proximity to Proposed Project infrastructure footprint. › In the event that a red squirrel drey or pine marten den is identified within the Proposed Project footprint during pre-commencement surveys, further surveys will be undertaken to ascertain whether the drey/den is in use. A Species Protection Plan as agreed by the project ecologist will be put in place in advance of felling works.		
Construction Phase					
MM60	Surface Watercourses and Sensitive Aquatic Faunal Species	EIAR Chapter 4, 6, 9	› A drainage design for the Proposed Project is provided in Section 4.6 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Project, in particular the Proposed Grid Connection. 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, tree felling, potential release of hydrocarbons during construction and storage, contamination from wastewater disposal, groundwater impacts, flooding impacts, potential impacts during horizontal directional drilling, and release of cement-based products.		
MM61	Bats	EIAR Chapter 6 Appendix 6-2 Appendix 6-4	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, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended). <u>Lighting Restriction</u> Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Wind Farm Site, and		

			consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Site to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. The proposed lighting around the Proposed Wind Farm site shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023). In addition, the Applicant commits to using lighting during construction, operation, and decommissioning only where necessary, in line with the updated Dark Sky Ireland Lighting Principles: › All lighting will be justified and used only when required. › Warm colour temperatures will be used to minimise impacts on wildlife and the night sky. › Glare and brightness will be minimised to protect visual comfort. › Luminaires will be angled downward with appropriate beam control to avoid over-lighting. › Lower mounting heights will be used where possible to better contain light. › Lighting will incorporate timers, dimmers, or PIR sensors to reduce energy use and emissions. › Natural areas such as trees, waterbodies, and nesting habitats will not be illuminated. <u>Biodiversity Management and Enhancement Plan (BMEP)</u> › The proposed planting of approximately 3,521 m of new native hedgerow will result in a net gain of approximately 1,555m of linear habitat within the Proposed Wind Farm site. This represents more than a 100% increase in linear landscape features compared to those lost. These new habitats have been strategically designed to link isolated linear features with areas of greater connectivity and will enhance both foraging and commuting opportunities for local bat populations. Further details are provided in Appendix 6-4 Biodiversity Management Enhancement Plan (BMEP).		

MM62	Habitats	EIAR Chapter 6, 10 Appendix 6-4	**<u>Annex 1 Raised Bog Habitats</u>** **Mitigation by Design** The Proposed Wind Farm has been specifically designed to avoid Article 17 mapped and unmapped Annex I areas of peatland habitat where possible and to minimise impacts thereon. This was achieved through an early-stage ecological constraints study informed by field surveys and habitat mapping. The Proposed Wind Farm layout was thereby altered through the iterative design process to avoid important peatland habitats. **Dust Mitigation** A range of construction phase mitigation measures to prevent dust impacts have been described as set out in Section 10.3.2.3 of Chapter 10 'Air Quality'. These include the following: › Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site. › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Proposed Wind Farm on specified haul routes only. › The agreed haul route road adjacent to the Proposed Wind Farm will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm proposed new entrance will be checked weekly for damage/potholes and repaired as necessary.		

			› The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Dust monitoring gauges will be deployed across the Proposed Wind Farm to detect any exceedances of acceptable dust levels. 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 Proposed Project to reduce the amount of emissions associated with vehicle movement. **Cutover Bog (PB4) and Associated Habitats** **Specific Mitigation** The loss of 4ha of cutover peatland for the Proposed Project will be offset through the BMEP which includes for the re-wetting of a cutover bog area measuring 5.3ha. This area comprises degraded and drained marginal peatland habitat. It is intended that excavated peat from the construction works will be used to block drains and/or create bunded wetland cells within this area. The mapped drains in this area are shown in Figure 3-2 of the BMEP. It is anticipated that the slowing down of water flows from this area will in turn enhance the adjacent Article 17 mapped raised bog area. A Monitoring Plan to ensure success of the proposed measures are also provided in the BMEP. Excavated material used within the area for this purpose will comprise strictly peat soils. In addition, the area for peat management proposed adjacent to Turbine T03 will be used as part of biodiversity proposals within the BMEP. It is proposed that the area is plug-planted with devil's bit-scabious for the benefit of marsh fritillary and will comprise strictly peat soils to encourage re-colonisation with peatland plant communities. The area proposed for peat/spoil management adjacent to proposed turbine T02 will be allowed to naturally revegetate.		

			Dust Mitigation The dust mitigations outlined above will be applied. **<u>Wet Heath/Wet Grassland (HH3/GS4) Mosaic and Transitional Wet Grassland-Marsh (GS4-GM1)</u>** **Construction Mitigation** Direct Habitat Impacts: › Construction works associated with the proposed turbine T08, including site set up, will be undertaken with supervision by an appropriately qualified and experienced ECoW. › The construction works area for proposed turbine T08 and associated site access routes will be fully fenced off (with solid hoarding where possible) to ensure there is no access or egress to adjacent areas of sensitive habitat. **Dust Mitigation** The dust mitigations outlined above will be applied. **<u>Woodland Habitats and Scrub</u>** The loss of woodland and scrub for the Proposed Project will be offset through the planting of native woodland as part of the BMEP (Appendix 6-4). In total, it is proposed to plant 1.9ha of native woodland. The proposed native woodland replanting areas are shown in Figure 3-1 of the BMEP. These have been strategically chosen to link up with identified bat commuting corridors within the Proposed Wind Farm site and will provide enhanced habitat forging area relative to the commercial conifer stands. The proposed planting will comprise native tree species of various age structures and will be of greater biodiversity value than the habitats being lost.		

			The BMEP and associated planting proposals will be implemented within planting season during or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat. **Treeline (WL2) and Hedgerow (WL1)** › Approximately 3,521m linear metres of new hedgerow planting will be carried out along selected boundaries of fields within the Proposed Wind Farm site. The replanting areas are presented in Figure 3-1 of the BMEP (Appendix 6-4). These have been strategically chosen to link up with identified bat commuting corridors in the Proposed Wind Farm site. This will result in more than a 100% net gain in this habitat within the Proposed Wind Farm site. Species planted in these locations will be of a similar composition to those occurring on site and will be of local provenance where possible. Further details with regard to species, planting location, and management is contained within the BMEP. The BMEP and associated planting proposals will be implemented within planting season during or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat.		
MM63	Invasive Species	EIAR Chapter 6 CEMP Section 3	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works: › A risk assessment and method statement will be provided by the Contractor prior to commencing works. › Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected. › A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface. › Stockpile areas will be chosen to minimise movement of contaminated soil. › Stockpiles will be marked and isolated. › Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.		

			› The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material. › An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans. Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following: › Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it. › Decontamination will only occur within designated wash-down areas. › Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches. › All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.		
			Operational Phase		
MM64	Surface Watercourses	EIAR Chapter 4, 6 Appendix 4-3 CEMP Section 3	**Mitigation by design:** <u>Proposed Wind Farm site</u> The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the Drainage drawings submitted with this planning application (Appendix 4-3): › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;		

			› Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds have been designed in consideration of the greenfield runoff rate. › The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; <u>Proposed Grid Connection</u> The trench associated with the Proposed Grid Connection will be backfilled and reinstated following the laying of the cables. As such, the permeability of the ground will remain unchanged. Mitigation measures for sediment control are the same as those detailed above for the construction phase. With regards to hydrocarbons: › Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the Proposed Project. These vehicles will be refuelled offsite; › Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;		

			› Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked; › Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillages.		
MM65	Bats	EIAR Chapter 6 Appendix 6-2	While High median activity was recorded at three locations, it is noted that habitats at these locations will change during the construction phase of the Proposed Project with the required implementation of the bat felling buffers. A monitoring and mitigation strategy has been devised for the Proposed Project, in line with the case study example provided in Appendix 5 of the NatureScot 2021 Guidance and based on the site-specific data. After year 1 monitoring, if a curtailment requirement is identified, a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers if deemed necessary. **Bat Vegetation buffer** › In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) should be applied to the siting of all wind turbines. However, Eurobats No. 6 guidance and NIEA recommends increased buffers of 100m and 200m around woodland/forestry areas, however, there is no scientific evidence to support these increased buffer distances in the UK. › NatureScot recommends that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features) is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post-construction monitoring. The success of the buffer mitigation will be assessed as part of post construction monitoring and updated where necessary. The formula provided in Section 6.1.3 of the Bat Report (Appendix 6-2) is presented to provide appropriate mitigation in relation to bats, and the relevant input required from turbine parameters, is the combination of the blade length and hub height. The proposed turbines to be installed on the Proposed Wind Farm site will have a maximum ground-to-blade tip height of 185m, rotor diameter of 163m, and hub height of 104m.		

			› There will be a requirement to remove linear vegetation i.e. treelines/hedgerows, to facilitate the required bat buffers at the Proposed Wind Farm site. These vegetation-free areas will be maintained during the operational life of the Proposed Project. **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 the cut-in speed of the proposed turbine. 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). › In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine. **Operational monitoring** › To assess the effects of the Proposed Wind Farm site on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. › The results of post-construction monitoring shall be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. At the end of Year 1, and if a curtailment requirement is identified (i.e. significant bat fatalities encountered), a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers. › At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in		

			order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties. › Section 6.2.1 of the Bat Report (Appendix 6-2) provides detail with regard to the monitoring to be carried out in years 1, 2 and 3 and includes bat activity surveys and carcass searches. **Lighting** With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.		
MM66	Marsh Fritillary Habitat	Appendix 6-4	During operation of the Proposed Wind Farm, it is proposed that existing areas of breeding marsh fritillary habitat are safeguarded. This includes the main breeding areas identified within the east of the Proposed Wind Farm site in Blocks L and K (Figure 3-1 of the BMEP). It has been agreed that these areas will be protected from development, land clearance or use conversion, or significant agricultural works for at least the duration of this Plan. The grasslands will be included as part of the Monitoring Plan for the Proposed Project (Section 3.3 of the BMEP) and will be subject to the below listed low-intensity management measures. During the course of the Monitoring Plan throughout the operation of the Proposed Wind Farm, the Project Ecologist may prescribe alternative management measures for these areas in order to maintain or increase their value for marsh fritillary: › Sheep grazing is unsuitable as they will graze selectively for flowers. Grazing only by cattle. › Use of supplementary feeding within Blocks L and K is prohibited. › If grazing the fields, a stocking level of no more than 0.5LU/ha will be applied. However, the stocking rate is to be subject to monitoring and altered as required. The goal is to have a structured sward between 12 and 25cm in height.		

			› Avoid mowing as this removes variations in sward height. › No fertiliser, slurry, herbicide, pesticide usage › Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less subject to disturbance, and outside of bird nesting season Maintain shelter on western, south-western and north-western sides of fields where possible.		
EIAR Chapter 7: Birds					
Pre- Construction Phase					
MM68	Birds (Pre-Construction Surveys)	EIAR Chapter 7	› Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Wind Farm site to identify any sensitive sites (e.g. nests or roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts, depending on the season in question. › The survey will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the development 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 (e.g. 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. › 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 onsite to the suspension of works within that area.		

MM69	Design of the Proposed Project	EIAR Chapter 7	The project design has followed the basic principles outlined below to avoid the potential for significant effects on avian receptors: › The Proposed Project avoids wildlife refuge sites (e.g., waterbodies) › Hard standing areas have been designed to the minimum size necessary to accommodate the proposed turbines, however it should be noted that the assessment of the hardstand footprint, within this EIAR, is based on the maximum potential footprint for a Proposed Wind Farm infrastructure (including the proposed turbines hardstands) under a precautionary scenario as outlined in Section 4.3.1.1.5 of Chapter 4. › The turbine delivery route has been selected to utilise built infrastructure i.e., public roads. › The Proposed Grid Connection has been selected to utilise built infrastructure for the majority of its length (i.e. cables to be laid within public roads and existing private roads/tracks). Cabling will be laid underground as a result and will avoid effects on roadside hedgerows and disturbance to nesting birds.		
Construction Phase					
MM70	Birds (Construction Phase)	EIAR Chapter 4, 6, 7, 9, 12 CEMP Section 3	A Construction and Environmental Management Plan (CEMP) has been prepared and will be in place prior to the start of the construction phase. The CEMP is included as Appendix 4-5 of this EIAR and details pertinent to birds are summarised below. 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 grant of permission or findings of any pre-construction survey results. › Works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible. Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. › Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, all work will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022 and areas will be replaced with suitable hedge/tree species which are common in the local context.		

			▸ A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is Appendix 6-4 to this EIAR. ▸ 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. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. Please see Chapter 12: Noise and Vibration for more detail associated with noise during the construction phase. ▸ Water protection measures will be implemented around existing watercourses as outlined in Chapter 9 of this EIAR, to protect the use of watercourses by birds. ▸ If winter roosting or breeding activity of birds of high conservation concern is 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. ▸ An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: ○ Organise the undertaking of pre-construction and construction phase walkover bird surveys to ensure that significant effects on birds will be avoided. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Wind Farm 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.		
Operational Phase					
MM71	Birds (Operational Phase Surveys)	EIAR Chapter 7	No significant operational phase impacts requiring mitigation were identified.		

			› Operational Bird Monitoring is detailed below in Table 8-1.		
EIAR Chapter 8: Land Soils & Geology					
Construction Phase					
MM73	Peat and Spoil Excavation	EIAR Chapter 4, 8 Appendix 4-2	<u>Proposed Wind Farm site</u> › Placement of turbines and associated infrastructure in areas with suitable ground conditions where appropriate (based on detailed site investigation data – the areas of deeper peat have been generally avoided by the Proposed Wind Farm infrastructure); › The peat/soils and subsoils which will be removed during the construction of turbine hardstands will be localised to the turbine locations. The peat/soil/subsoil will be placed/spread locally alongside the excavations or stored within the 5 no. designated peat and spoil management areas; › Excavated peat/soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › At the identified peat and spoil management areas, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated; › The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat will be stored in the centre of › the peat management areas with firmer/drier peat placed around the outside; › The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works; › It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat;		

			› Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. › Where available, 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 and spoil within the peat and spoil management areas; › Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site; › Supervision by the Project Geotechnical Engineer will be carried out for the works; and, › An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off. (interceptor drains will not be required at all areas as the existing drainage network can function as interceptor drains – silt fences will be installed upgradient of the peat and spoil management areas in these locations). <u>Proposed Grid Connection</u>: › Any overburden excavated from the cable trench will either be managed in the identified peat and spoil management areas within the Proposed Wind Farm or sent to an appropriately licensed facility; › Some excess spoil material or pavements materials containing tar generated during the cable route construction will be transported by permitted waste contractors to a suitable permitted/licensed site for disposal/recovery.		
MM74	Erosion of Exposed Peat, Soils and Subsoils During Construction	Chapter 8	› Soil/subsoil removed from the turbine locations and associated access roads will be used for landscaping, placed/spread locally alongside the excavation or will be stored in the designated peat and spoil management areas. › Temporary drainage systems will be required to limit runoff impacts during the construction phase. › In forestry areas, brash mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they 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. › Soils/subsoils removed from the Proposed Grid Connection groundworks will be removed and either stored at the Proposed Wind Farm designated peat and spoil management areas or taken to an appropriately licenced facility.		
MM75	Contamination of Soil by Leakages and Spillages of Hydrocarbons	EIAR Chapter 4, 8	› Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Where possible, off-site refuelling will occur at a controlled fuelling station; › On-site refuelling will be undertaken using a double skinned bowser or a refuelling truck; › 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 for leaks and signs of damage; › The on-site 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; › All waste tar material arising from works on hard top roads will be removed off-site and taken to licenced waste facility; and, › An emergency response plan for the construction phase to deal with accidental spillages is contained within the Construction and Environmental Management Plan (which is contained in Appendix 4.5).		
MM76	Erosion of Exposed Peat, Soils, and Subsoils During Tree Felling	EIAR Chapter 8	All proposed felling works will be completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and DAFM guidance documents to ensure that felling results in minimal potential negative effects on the local soil and subsoil environment.		

			In addition, the following mitigation measures will be implemented during felling operations: › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; › All machinery will be operated by suitably qualified personnel; › These machines will traverse the Proposed Wind Farm site along specified off-road routes (referred to as racks); › 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; › As felling progresses, the harvester will collect brash produced by the felling and place it in front of the machine before it advances forward along the rack; › The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase; and, › The location of racks will be chosen to avoid wet and potentially sensitive areas.		
MM77	Peat Instability and Failure	EIAR Chapter 8 Appendix 8-1	The following control measures incorporated into the construction phase of the Proposed Project will ensure the management of the risks for this site: › Appointment of experienced and competent contractors; › The Proposed Wind Farm site will be supervised by experienced and qualified personnel; › Allocate sufficient time for the Proposed Project construction programme (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 managed robust drainage system; › Prevent placement of loads/overburden on marginal ground; › Implementation of safety buffers around deep peat areas as detailed in the GPSRA (FTC, 2025), Please refer to Appendix 8-1 for details on the safety buffers and stockpile restrictions.		

			› 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 the construction phase of the Proposed Wind Farm.		
MM78	Biodiversity Management Enhancement Plan (BMEP)	EIAR Chapter 6, 8 Appendix 6-4	All proposed habitat management and enhancement works will be in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte, DAFM and NatureScot guidance documents to ensure minimal potential negative effects on the local peat, soil and subsoil environment. Given the nature of the restoration measures the following mitigation measures are proposed: › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › Proposed off-road routes will be walked in advance of any machinery; › All machinery operators will be experienced; › The Proposed Wind Farm site will be walked before a machine goes off-road; › Bog mats will be used where the excavator is required to travel over wet ground; and, › A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.		
			Operational Phase		
MM79	Site Road Maintenance	EIAR Chapter 8	› Use of aggregate from authorised quarries for use in road and hardstand maintenance.		
MM80	Site Vehicle/Plant Use	EIAR Chapter 4, 8 CEMP Section 6	› Vehicles used during the operational phase will be refuelled off site before entering the Site; › No fuels will be stored on-site during the operational phase; and › Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and, › An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be contained in the CEMP (Appendix 4-5).		

MM81	Use of Oil In Transformers	EIAR Chapter 4, 8 CEMP Section 3, 6	› All transformers and substation areas will be bunded to 110% of the volume of oil used in each transformer/substation; and, › An emergency plan for the operational phase to deal with accidental spillages will be contained in the CEMP (Appendix 4-5).		
EIAR Chapter 9: Water					
Pre- Construction Phase					
MM83	Temporary Drainage Works	EIAR Chapter 4, 9 Appendix 4-3 CEMP Section 3	Prior to the commencement of construction works (new road/hardstand, turbine foundation installs or upgrade of existing roads) the following key temporary drainage measures will be installed: › All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; › Clean water interceptor drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
Construction Phase					
MM84	Tree Felling	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*" are shown in Table 9-12 of the EIAR. **Mitigation by Design:**		

			Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in 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 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 they 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 spoil repository 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 onsite 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; › All refuelling will be completed outside of the designated 50m hydrological buffer zones. 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 any watercourse. These will be taken daily and kept on site for record and inspection.		
MM85	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	EIAR Chapter 4, 9 Appendix 4-2 Appendix 4-3 CEMP Section 3	<u>Mitigation by Avoidance</u> 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). The majority of the key Proposed Project areas are located significantly away from the delineated 50m watercourse buffer zones with the exception of T2, its associated hardstand and access roads, the upgrading of an existing watercourse crossing, new watercourse crossings, upgrades to existing site access tracks and new site access tracks. Additional control measures, which are outlined further in MM85, will be undertaken at these locations. The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) 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. <u>Mitigation by Design</u>: **Proposed Wind Farm site**:		

			▸ Source controls: ○ Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. ○ Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas. ▸ In-Line controls: ○ Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. ▸ Treatment systems: ○ Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. It should be noted that for the Proposed Wind Farm site, an extensive network of forestry, peat and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls. The main elements of interaction with existing drains will be as follows: ▸ Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm site drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;		

			› Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; › Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; › Buffered outfalls which will be numerous over the Proposed Wind Farm site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site; and, › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. **Proposed Grid Connection:** The majority of the Proposed Grid Connection is >50m from any nearby watercourse, sections within 50m of the Proposed Grid Connection are confined to existing watercourse crossings at bridges and culverts. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils. There is a total of 10 no. watercourse crossings (4 no. crossings over EPA mapped watercourses and additional crossings 6 no. over watercourses which are not included in the EPA database) along the Proposed Grid Connection. All the crossings are existing bridges and culverts along the public road. No in-stream works are required at any of these crossings, however due to the proximity of the streams to the construction work at the crossing locations, there is a potential for surface water quality impacts during trench excavation work. Mitigation measures are outlined below. A constraint/buffer zone will be maintained for all crossing locations where possible, whereby all watercourses will be fenced off. 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. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the site. This will act to prevent entry to water courses 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. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones. **Silt Bags:** Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. **Settlement Ponds:** The Proposed Wind Farm footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr or 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006).		

			The supporting design calculations for all settlement ponds are included on Drawing D501 included in Appendix 4-3. **Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In the absence of level spreaders, the potential for ground erosion is significantly greater than not using them. Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the Proposed Wind Farm site to provide a polishing filter for the Proposed Wind Farm drainage prior to reaching the downstream watercourses. Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls → check dams → silt traps → settlement ponds → level spreaders → silt fences → vegetation filters). **Water Treatment Train:** A final line of defence will be provided by a water treatment train such as a “Siltbuster”. If the discharge water from construction areas fails to be of a high quality during regular inspections, 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.		

			Pre-emptive Site Drainage Management The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily basis at the Site to direct proposed construction activities: › General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; › Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests either 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 will be completed: › All active excavations will be secured and sealed off; › Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and, › No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. **Management of Runoff from the Peat and Spoil Management Areas:** It is proposed that excavated peat and spoil will be placed in the designated peat and spoil management areas within the Proposed Wind Farm site. Peat excavated from T01, T02, T03 and T08 (72,490m^3) will be transported to the adjacent peat storage areas, used to create pressure berms on both sides of the floating roads or used for landscaping around the hardstands. Peat and spoil excavated from T04 to T08 (43,900m^3) will be transported to the peat/spoil storage areas at T04 and T05 or used as landscaping around the hardstands where no peat is present (T04 to T07). Shallow Peat/Topsoil removed from T04 to T08 will be temporarily stockpiled locally and used to cover the peat/spoil storage areas at T04 and T05, as well as any landscaping areas. Spoil excavated from the substation platform (2,500m^3) will either be landscaped around the platform or transported to the spoil storage areas at T04 and T05. A small volume of spoil (~350m^3 per turbine base) will be used as ballast backfill. The spoil management areas are located outside the 50m hydrological buffer zone. Proposed surface water quality protection measures regarding the peat and spoil management areas are as follows: › Where applicable the vegetative topsoil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.2 to 1.5 metres, following which the vegetative-top soils layer will be reinstated;		

			› Where reinstatement is not possible, peat and spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff; › An interceptor drain will be installed upslope of the identified peat and spoil management areas to divert any surface water away from these areas where necessary; › Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level; › Once the peat and spoil management area has been seeded and vegetation is established the risk to downstream surface water is significantly reduced. Therefore, at each stage of the peat and spoil management area development the above mitigation measures will be deployed to ensure protection of downstream water quality.		
MM86	Works Within the Hydrological Buffer Zones within the Proposed Wind Farm Site	EIAR Chapter 9	<u>Mitigation by Avoidance</u>: The Proposed Wind Farm layout has been designed to limit the amount of works within the delineated hydrological buffer zones associated with natural watercourses. Several consultations between HES, MKO and the project design team completed in the spring and summer of 2024 resulted in several design iterations which had the overall aim of reducing the volume of works within the buffer zones. It is worth noting that whilst T2 is located within the 50m buffer zone. An existing access track separates the proposed turbine location from the EPA mapped watercourse, which provides a natural barrier to prevent any runoff from the works are entering the watercourse at this location. <u>Mitigation by Design</u>: All mitigation measures detailed in MM84 will be implemented at these work locations. 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; and, › All works will be completed during the dry weather periods and works will be postponed in the event of rainfall.		
MM87	Surface Water Quality from Excavation Dewatering	EIAR Chapter 9	Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; › If required, pumping of excavation inflows will prevent build-up of water in the excavation; › The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; › 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 surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; › Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; and, › A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.		
MM88	Hydrocarbons	EIAR Chapter 4, 9 CEMP Section 3	Mitigation measures proposed to avoid release of hydrocarbons are as follows: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site.		

			› On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use › Only designated trained operatives will be authorised to refuel plant on-site; › Refuelling or maintenance of machinery will not occur within 100m of a watercourse; › Fuels stored on the Proposed Wind Farm site will be minimised; › Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-5). Spill kits will be available to deal with accidental spillages. › In relation to the Proposed Grid Connection, whilst no oils are around the cables, a lubricant will be used during cable pulling. The lubricant to be used is Techlude PHD which is a pourable, non-flammable, non-toxic and substantially biodegradable water-based product that does not pose a threat to the environment (Techlube PHD Technical Information Datasheet: https://www.socomore.com/en/waterbased-lubricant-techlube-phd-20l-p-bk1.html).		
MM89	Wastewater	EIAR Chapter 9	› During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds (and along the Proposed Grid Connection as required), 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 Site and removed after use from the Site to be discharged at a suitable off-site treatment location; and, › No water or wastewater will be sourced on the Site, nor discharged to the Site.		
MM90	Use of Cement Based Products	EIAR Chapter 4, 9 CEMP Section 3	› No batching of wet-concrete 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; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. 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 undertaken at lined concrete washout ponds; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, › At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.		
MM91	Morphological Changes to Surface Watercourses along the Proposed Grid Connection	EIAR Chapter 9	The vast majority of the Proposed Grid Connection is >50m from any nearby watercourse, sections within 50m of the route are confined to existing watercourse crossings at bridges. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils. Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed. The following mitigation measures are proposed for the 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.		
MM92	Morphological Changes to Surface Watercourses/ Drains within the Proposed Wind Farn site	EIAR Chapter 9	Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed: › The proposed new stream crossings at the Proposed Wind Farm site will be clear span watercourse crossings or bottomless box culverts. The construction methodology for these crossings have been designed to eliminate the requirement for instream work, and the existing banks will remain undisturbed. No in-stream excavation works are proposed at these locations and therefore there will be no direct impact on the stream at the proposed crossing locations. Abutments will be constructed from precast units combined with in-situ foundations; › All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (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; › Once the foundations have been completed at both sides of the watercourse, the pre-cast concrete box culvert will be installed using a crane and there will be no contact with the watercourse; › Where the box culvert is installed in sections, the joint will be sealed to prevent granular material entering the watercourse; › 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); › 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; and,		

			› All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.		
MM93	Piled Foundations	EIAR Chapter 9	The proposed mitigation measures designed for the protection of downstream surface water quality and groundwater quality within the peat bog will be implemented at all construction work areas. › Mitigation measures for sediment control are detailed in MM84. › Mitigation measures for the control of hydrocarbons during construction works are detailed in MM87. › Mitigation measures for the control of cement-based products during construction works are detailed in MM89. Proposed mitigation measures relative to piling works will comprise: › Strict QA/QC procedures for piling works will be followed; › Piles will be kept vertical during piling works; › Good workmanship will be employed during all piling works; and › Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater.		
MM94	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, so overdosing cannot occur; › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated 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 is recycled and retreated, which has a secondary positive effect of reducing carryover; and, › Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs).		

MM95	Surface Water Quality Due to Fluvial Flooding During Construction	EIAR Chapter 9 CEMP Section 3	The Project EM (Environmental Manager) or the site ECoW will be responsible for monitoring weather forecasts during the construction phase. There will be a 24-hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Eireann), planned responses will be undertaken. › Cessation of all construction works until the storm event, including the storm runoff has passed. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy rainfall events, and before construction works recommence, the Proposed Wind Farm site will be inspected and corrective measures implemented to ensure safe working conditions e.g. dewatering of standing water in open excavations, etc. › Exposed soils/peat (exposed temporary stockpiles) will be sealed with the bucket of an excavator during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., overnight and weekends). With regards to the fluvial flood zones at the Proposed Wind Farm site, a managed retreat from the fluvial flood zones will be implemented in the event of a high intensity rainfall event and/or weather warning related to rainfall. This will include the following: › Any areas where soil/subsoil is exposed at the surface will be compacted firmly with a digger bucket of a suitably sized excavator. › Open trenches will be backfilled and compacted. › All oils, fuels and waste material will be removed from the flood zones. › Existing sediment control measures will be removed, as these may be washed away and deposited elsewhere by the floodwaters. › Site access tracks will be scraps and any excess soft material will be removed from the flood zones. › All plant, machinery and equipment will be removed from the flood zones.		
MM96	Horizontal Directional Drilling along the Proposed Grid Connection	EIAR Chapter 4, 9	› Near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern		

		CEMP Section 3	Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May 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); › 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 watercourse channels; › 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; › 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 been 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 watercourse; › 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 a watercourse or drain;		

			› Works shall 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 watercourse; › 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 river 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; › There will be no refuelling allowed within 100m of the watercourse crossing; and, › All plant will be checked for purpose of use prior to mobilisation at the watercourse 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.		
MM97	Discharges	Appendix 4-3	› Water containing silt will not be discharged or pumped directly to any natural watercourse. All discharges will be made over open ground or into existing field drain with silt trap at a minimum of 20m from the nearest watercourse unless otherwise stated. › No excavated material will be stored within any surface water buffer zone. › Pumped water will be directed into track side ditches and treated in settlement ponds and vegetation swales prior to overland discharge. › Pumping of clean water from excavations/ or over-pumping in drains/ ditches/ steams will be completed in a manner that will not cause scour or erosion at point of release/ discharge. This will be done by reducing the flow velocities or by use of suitable splash plates, and/or other similar discharge controls. › Vegetation will not be stripped from existing drains/ ditches unless absolutely necessary.		
			Operational Phase		
MM98	Replacement of Natural Surfaces with Lower Permeability Surfaces	EIAR Chapter 4, 9 Appendix 4-3 CEMP Section 3	**Mitigation by Design:** The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the drainage drawings submitted with this planning application (Appendix 4-3): › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;		

			› Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds have been designed in consideration of the greenfield runoff rate.		
MM99	Runoff Resulting in Contamination of Surface Waters	EIAR Chapter 4, 9 CEMP Section 3	› Mitigation measures for sediment control are the same as those outlined above for the construction phase. With regards to hydrocarbons: › Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the Proposed Project. These vehicles will be refuelled offsite; › Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked; › Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillages.		

EIAR Chapter 10: Air Quality					
Construction Phase					
MM101	Exhaust Emissions	EIAR Chapter 4, 10, 15 CEMP Section 3	› Proposed Project 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 plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use. › Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All plant and materials vehicles shall be stored in dedicated areas (onsite). › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes 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 facility will be local to the Site to reduce the emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be sourced from local quarries. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).		
MM102	Dust Emissions	EIAR Chapter 10 CEMP Section 3	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored		

			by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site. › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Site on specified haul routes only. › The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary. › The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Dust monitoring gauges will be deployed across the Proposed Wind Farm site to detect any exceedances of acceptable dust levels. › 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 Proposed Project to reduce the amount of emissions associated with vehicle movement. › A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures › Groundworks (i.e., works with potential to create dust) associated with proposed turbines T01, T03, and T08 will be fully supervised by an ECoW. › Groundworks (works with potential to produce dust) at proposed turbines T01, T03, and T08 will be restricted to the marsh fritillary hibernation season (October to January inclusive) as larvae will be under vegetation and within hibernation webs which will act as a natural shield. › The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with all proposed mitigation as set out in above.		

			› If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work. › The ECoW will have power to halt construction works if required as outlined above.		
Operational Phase					
MM103	Exhaust and Dust Emissions	EIAR Chapter 10	› Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. › When stationary, delivery and onsite vehicles will be required to turn off engines. › 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 Site to reduce the emissions associated with vehicle movements.		
EIAR Chapter 11: Climate					
Construction Phase					
MM105	Greenhouse Gas Emissions	EIAR Chapter 4, 11, 15. CEMP Section 3	› 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 site on specified routes only unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › It is intended to obtain the materials for the construction of the Proposed Wind Farm site from local licenced quarries.		

			› Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas › A Construction and Environmental Management Plan (CEMP) (Appendix 4-5) will be in place throughout the construction phase. › The CEMP (Appendix 4-5) includes a Waste Management Plant (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. ○ The WMP 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 4.4.6 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 Proposed Project to reduce the amount of emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be obtained from local appropriately authorised quarries, for the purposes of this assessment 6 no. existing, authorised quarries, located within 20km of the Proposed Wind Farm site have been selected. This will reduce journey distances of the delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements. › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
Operational Phase					
MM106	Greenhouse Gas Emissions	EIAR Chapter 11	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.		
EIAR Chapter 12: Noise & Vibration					
Construction Phase					

MM108	Construction Phase (Noise)	EIAR Chapter 12 CEMP Section 3	While it was concluded in Section 12.6.1 of Chapter 12 that there will be no significant noise impact associated with the construction of the Proposed Project and that no specific mitigation measures were required, the contract documents will clearly specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria: › No plant used on site will be permitted to cause an on-going public nuisance due to noise. › 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. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 12-1 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* › The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. 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.		
			Operational Phase		

MM109	Operational Phase (Noise)	EIAR Chapter 12	**Amplitude modulation** In the event that a complaint which indicates potential Amplitude Modulation (AM) associated with turbine operation, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise (9 August 2016) or subsequent revisions. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including methods to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which may include turbine curtailment and/or stopping turbines under specific operational conditions. In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the Proposed Project will be effectively addressed by the operator. **Noise Monitoring** An operational noise survey will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of the Proposed Project being fully commissioned. If an exceedance of the noise criteria is identified as part of the c assessment, the guidance outlined in the IOA GPG, specifically Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 *Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.*		

EIAR Chapter 13: Landscape & Visual					
Pre-Commencement, Construction, Operation and Decommissioning					
MM111	Landscape Effects	EIAR Chapter 13	**Mitigation by Design:** The Proposed Project was strategically selected in a landscape highly suitable for the development of wind energy. Through the iterative project design process, various best practice tools for assessing the landscape and visual impact of a proposed wind farm development were utilised to bring forward the optimum design for the Proposed Wind Farm with respect to landscape and visual factors. These tools include landscape modelling, Zone of Theoretical Visibility (ZTV) mapping and the preparation of photomontage visualisations. The iterative design process was informed by the siting and design guidance for wind farms in specific landscape types as set out in the Guidelines (DoEHLG, 2006) and with regard to the Draft Guidelines (DoHPLG, 2019). The final design of the Proposed Project included the careful micro-siting of infrastructure with the aim of preventing the potential for significant landscape and visual effects. Details of the various turbine layout iterations included as part of this design process are included in this EIAR, Chapter 3: Consideration of Reasonable Alternatives. Landscape and visual 'mitigating' factors which were key to the site selection and design of the Proposed Wind Farm are established below, these factors or of key relevance to this LVIA in this chapter: › **Appropriate Wind Energy Development Zoning Ratings in Local Planning:** All proposed turbines are in Co. Galway land area zoned as 'Open to Consideration' for wind energy development in the Galway wind energy strategy policy. › **Appropriate Landscape Sensitivity in Local Planning:** The Proposed Wind Farm has been strategically sited within an area designated as 'Low' landscape sensitivity in local planning policy (Galway County Development Plan 2022-2028), a Landscape Character Area of the lowest landscape sensitivity rating in Co. Galway.		

			› **Compliance with Wind Energy Development Guidelines Set-Back Distance:** Siting of proposed turbines exceeds the minimum 500m set-back distance from residences set out in the Guidelines (DoEHLG, 2006). › **No Impact on Designated Scenic Routes and Views:** The Proposed Wind Farm has been strategically sited in a location where there is no impact on any designated protected views as set out in local planning policy. › **No Impact on Designated Landscape Receptors:** The Proposed Wind Farm has been strategically sited in a landscape setting (an LVIA Study Area to 20km from the proposed turbines) with no designated or protected high sensitivity landscape receptors in local planning policy of county, regional or national renown. › **Sparsely Settled & Highly Modified Landscape**: The infrastructure of the Proposed Wind Farm has been strategically sited within a sparsely settled landscape characterised by common agricultural land, commercial forestry and cutover peatland. It is therefore a modified working landscape deemed to be of low landscape sensitivity, and a site capable of effectively absorbing the Proposed Wind Farm. › **Flat Nature of the Proposed Wind Farm site & Surrounds.** The proposed turbines have been located within a flat site surrounded by lands of similar elevations which limit open views of the project. This topographic feature of the Proposed Wind Farm site and surrounds mitigates the potential for overbearing or domineering effects provided sufficient setback from receptors is designed into the project. It also means that separation distances between receptors and turbines becomes important as the proposed turbines appear smaller in scale quickly (over shorter distances) when viewed in this planar view. › **Localised Visual Screening:** Mature vegetation and undulating terrain restrict wider landscape visibility to primarily within a 5km radius. › **Large Setback from Population Centres and Receptors:** Site selection and siting of proposed turbines ensures limited visibility and large setback distances from large population centres and designated landscape and visual receptors of high sensitivity. › **Coherent Turbine Layout:** The proposed turbines are spaced appropriately in a curved linear array, such that they read coherently within the landscape and are of acceptable layout according to the recommended siting and design of turbines for Hilly and Flat Farmland in the Guidelines (DoEHLG, 2006), and cognisant of the Draft Guidelines (DoHLPG, 2019).		

			› **Underground Grid Connection:** The intended connection to the national electricity grid is underground, thereby eliminating potential landscape and visual effects during the operational phase.		
EIAR Chapter 14: Archaeology, Architectural and Cultural Heritage					
Pre-Construction/ Construction Phase					
MM112	Indirect and Direct Construction Phase	EIAR Chapter 14 CEMP Section 3	› Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the accessible locations of proposed turbine hardstands, temporary construction compounds, onsite substation and along the access roads and greenfield section of the Proposed Grid Connection. Archaeological test trenching will be carried out under licence to the National Monuments Service of the DoHPLG and will permit the identification of previously unknown sub-surface archaeological features. This may be followed by further mitigation, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHPLG. These mitigation measures will ensure that previously unrecorded archaeological features are appropriately recorded and/or preserved in advance of construction commencing, mitigating the potential effects of the Proposed Project. › A large portion of the Proposed Wind Farm site is dominated by peat and forestry, which is not suitable for archaeological test trenching. Archaeological monitoring of topsoil stripping will be carried out at these locations, including lands adjacent to watercourses. Additionally, the section of Proposed Grid Connection that passes through greenfield will be subject to archaeological monitoring. This work will be carried out under licence to the National Monuments Service of the DoHPLG. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHPLG. › Where direct effects have been identified to townland boundaries as part of the construction of the Proposed Project, works will be subject to archaeological monitoring, to include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DoHPLG.		

			All excavations as part of the Proposed Grid Connection within the Zone of Notification of AH15 will be monitored under licence. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH.		
			Operational Phase		
MM113	Indirect Operational Phase	EIAR Chapter 14	› Moderate indirect effects to the setting of ringforts AH97 and AH98 will be partially mitigated by the proposed linear replanting to the north and west of AH97 and to the south of AH98. It is noted that neither of these sites are accessible to members of the public. › It is not possible to further mitigate indirect effects to archaeological, architectural and cultural heritage receptors due to the nature and scale of the proposed turbines within the landscape. Indirect effects are not permanent and would be removed following the decommissioning and removal of the turbines.		
			EIAR Chapter 15: Material Assets		
			Material Assets - Traffic		
			Pre-Construction, Construction and Operation		
MM114	Traffic	EIAR Chapter 15	**Mitigation by Design** › Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.2.2 of Chapter 15.		

			› Selection of the shortest Proposed Grid Connection diversion routes, minimising the impacts on the existing road network and traffic.		
MM115	Delivery of abnormal loads	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. › It is estimated that 64 abnormal sized loads will be delivered to the Site, comprising 22 convoys of 3 vehicles, undertaken over 8 separate nights. › These nights will be spread out over an approximate period of 5 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.		
MM116	General Traffic Management	EIAR Chapter 15 Appendix 15-2	A detailed **Traffic Management Plan (TMP)** will be provided specifying details relating to traffic management and included in the CEMP 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. › **Delivery Programme** – a programme of deliveries will be submitted to Galway County Council in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities, TII and MMaRC and 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 Site. › **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or 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 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 can 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. › **Diversion routes during grid construction –** The identification and agreement with suitable diversion routes during the construction of the Proposed Grid Connection. › **Liaison with the relevant local authority** - Liaison with Galway 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 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 15.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable. › **Identification of delivery routes** – These routes will be agreed with Galway County Council and adhered to by all contractors. › **Delivery times of large turbine components** - The TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.		

			› **Travel plan for construction workers –** While the assessment above has assumed the worst case in that construction workers will drive to the 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 an area for parking. › **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4-5. › **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 Phase					
MM118	Existing Built Services	EIAR Chapter 4, 15	The Proposed Wind Farm has been designed to avoid exisiting underground electricity cables and can be described as mitigation by design, therefore there is no potential to give rise to effects on electrical services. Notwithstanding the above, specific measures are incorporated into the CEMP, included as Appendix 4-5 of this EIAR, to ensure that the construction of the Proposed Project will not have effect on underground electrical cables and built services at the Site. The mitigation measures include the following: › Goal posts will be established under overhead lines 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 the routes and operating voltages of overhead electricity lines running above the Proposed Grid Connection. 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 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. › Prior to the delivery of turbines to the Proposed Wind Farm site, a dry run of the route using vehicles with similar dimensions will occur. › When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, 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 is undertaken 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 Section 5 of the CEMP and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. › Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. › Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. › Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks. › 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 high-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 high-pressure pipeline and the telecommunication lines. › The developer will also carry out further consultation in the pre-construction phase and construction phase with GNI to confirm the crossing methodology to be deployed and to ensure that no new service crossings have been implemented. Furthermore, site investigation will be undertaken post planning grant and results will be shared with GNI as part of the Design Review process prior to construction. › In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.		
Construction Phase					
MM119	Waste Management	EIAR Chapter 15 CEMP Section 3	› All waste generated on site during the construction phase will be contained in waste skip 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 site. Therefore, all waste streams generated on site will be deposited into a single waste skip. The waste material will be transferred to a Materials Recovery Facility (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 the CEMP, which is included as Appendix 4-5.		
Operational Phase					
MM120	Waste Management Services	EIAR Chapter 15	› It is not anticipated that any significant volume of waste will be generated within the Site during the operational phase of the Proposed Project as only a small		

			number of operational and maintenance personnel will be present within the Proposed Wind Farm site at certain times. Any waste generated due to the operation and maintenance of the Proposed Project will be disposed of in a covered skip, located within the proposed onsite 38kV substation compound. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.		
MM121	Telecommunications	EIAR Chapter 15 Appendix 15-4	› In the event of interference occurring to telecommunications, the Guidelines (DoEHLG, 2006) acknowledge that *'electromagnetic interference can be overcome'* by the use of divertor relay links out of line with a wind farm. › A signed protocol agreement between 2rn and the Applicant can be found in Appendix 15-4. The Protocol Document ensures that in the event of any interference occurring to television or radio reception due to operation of the Proposed Wind Farm, the required measures, as set out in the Protocol Document, will be carried out by the Applicant to rectify this. The Protocol Document ensures that the appropriate mitigation is carried out in the event of unanticipated broadcast interference arising to television or radio reception as a result of the Proposed Wind Farm.		
MM122	Aviation	EIAR Chapter 15	As no impacts were identified by the IAA or DoD, no mitigation measures are required. However, the following IAA and DoD requests will be complied with should the Proposed Project be consented: <u>Irish Aviation Authority</u> › Agree an aeronautical obstacle warning light scheme for the wind farm development › Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and › Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection. <u>Department of Defence</u>		

			› All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near InfraRed (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.		

8. MONITORING PROPOSALS

All monitoring proposals relating to the pre-commencement, construction and operational phases of the Proposed Project are set out in various sections of the EIAR, NIS and Biodiversity Enhancement Plan prepared as part of the planning application to Galway County Council.

This section of the Construction and Environment Management Plan 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 18: Schedule of Mitigation and Monitoring Measures. Decommissioning Phase monitoring measures are not included in the table below, however, can be viewed in Appendix 4-6 (Decommissioning Plan) of this EIAR.

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	Mitigation Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Chapter 4, 9 CEMP Section 4	› An inspection and maintenance plan for the drainage system on-site will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be necessary, 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 or the Project Hydrologist. The drainage inspection and maintenance plan are included in the CEMP in Appendix 4-5 of this EIAR.	On going	Monthly	Project Hydrologist
MX2	Invasive Species	EIAR Chapter 6 CEMP Section 3	› A pre-commencement invasive species survey shall be completed for the Site.	Once	As required	Project Ecologist
MX3	Marsh Fritillary	EIAR Chapter 6	› A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year in advance of construction throughout footprint areas of the Proposed Wind Farm › If active larval webs are recorded within the construction footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the construction footprint. 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 would only be translocated by the ECoW to existing breeding areas as shown in Appendix 6-5. › Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres near T01, T03, T05 and T08. › ECOW supervision will be required for construction of components near existing breeding areas (such as Turbines T01, T03, T05, T08 and along the proposed access road to T02).	Once	As required	Project Ecologist

			› Where suitable marsh fritillary habitat occurs in close proximity to Proposed Wind Farm infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. › No clearance of scrub within the proposed bat buffer of Turbines T05 or T08 will be carried out until sufficient exclusion zone fencing to a minimum of 5m is in place, or unless under ECoW supervision			
MX4	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) where possible to avoid the most sensitive time of the year for most bird species with the potential to use the Proposed Wind Farm site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Wind Farm site to identify sensitive sites (e.g. roosts). › Any requirement for construction works to run into the subsequent breeding or winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding or roosting birds of conservation concern. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). The survey will aim to identify sensitive sites (e.g., nests or roosts depending on the season in question). › This monitoring will involve surveying onsite and to a 500m radius of the Proposed Wind Farm footprint/works areas. Monitoring will be undertaken by a suitably qualified ornithologist. The survey period will include one month prior to the initiation of works, four visits between April and July and one visit during the winter period (October). If a sensitive area is identified, the nest/roost sites will be located, and no works shall be undertaken within a species-specific buffer in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works within the buffer zone shall be permitted until it can be demonstrated that the species is no longer reliant on the area for breeding or roosting. › 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	Once	As required	Project Ornithologist

			will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.			
MX5	Tree Felling	EIAR Chapter 9	› 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, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week passes, 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).	As Required	Monthly	ECoW
Construction Phase						
MX6	Health and Safety	EIAR Chapter 4, 5 CEMP Section 5	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 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.	Daily	Daily	PSCS

MX7	Water Quality and Monitoring	EIAR Chapter 4, 9 CEMP Section 4	› 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. › 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.	As required	As Necessary	ECoW
MX8	Water Quality and Monitoring	EIAR Chapter 4, 9 CEMP Section 4	› Daily general visual inspections of site operations and inspections of all drainage infrastructure within the Site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW; › 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 ECoW 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/ ECoW during construction phase; › Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and	Daily	As Necessary	ECoW

			› A written record will be maintained or available on-site within this Construction Environmental Management Plan (CEMP) which will be maintained on-site during the construction phase.			
MX9	Reactive Site Drainage Management	EIAR Chapter 4 Appendix 4-3	› 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 or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the 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 or supervising hydrologist 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.	As required	As Necessary	ECoW
MX10	Water Quality and Monitoring	EIAR Chapter 9	› Daily surface water monitoring forms will be utilised at every works site near watercourses. These will be taken on a regular basis and kept onsite for record and inspection.	Daily	As Necessary	ECoW
MX11	Surface Water Quality	EIAR Chapter 9 CEMP Section 4	› Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. › 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 as outlined in Figure 9-6 of the EIAR. › Baseline sampling will be completed on at least two occasions, and these should 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.	As Required	Monthly	ECoW

			› Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken.			
MX12	Tree Felling	EIAR Chapter 9	› 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 › Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.	As Required	Monthly	ECoW
MX13	Plant and Equipment Inspections	EIAR Chapter 9	› The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX14	Traffic and Transport	CEMP Section 3	› The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the site entrances will be checked weekly or damage/potholes and repaired as necessary.	As required	Monthly	ECoW
MX15	Biodiversity	CEMP Section 4	A Project Ecologist/Ornithologist will be appointed. 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 Site. › Oversee management of ornithological and ecological 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 on-site. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.	As required	As required	Project Ecologist/Ornithologist
MX16	Peat and Spoil Management	EIAR Chapter 4	› Inspections of the peat and spoil management areas will be made by the Project Geotechnical Engineer through regular monitoring of the works	As required	As required	Geotechnical Engineer

		CEMP Section 4				
MX17	Archaeological Monitoring	EIAR Chapter 13 CEMP Section 4	› Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › A report on the monitoring should be compiled on completion of the work and submitted to the NMS and the Local Authority. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.	As Required	As Required	Project Archaeologist
Operational Phase						
MX18	Drainage Inspections	CEMP Section 3	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.	Monthly	Monthly	ECoW
MX19	Bats	EIAR Chapter 6 Appendix 6-2	To assess the effects of the Proposed Project on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. **Bat Monitoring Plan** › Post-construction surveys will be carried out as per the pre-construction survey effort. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. › Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021).	Years 1, 2, 3	Annually	Project Ecologist

			› Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. › Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s).			
MX20	Biodiversity	EIAR Chapter 6 Appendix 6-4	Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared. The BMEP will be updated and amended where required to improve the efficacy of the prescribed works. **Marsh Fritillary Enhancement Measures:** › Following establishment of devils bit scabious in Blocks C, F and H, marsh fritillary habitat suitability assessments will be carried out in these areas as part of the Monitoring Plan. Habitat condition assessments include surveying along a predetermined route for the presence and abundance of devil's bit scabious as well as recording the vegetation height and any grazing evidence within the study site and is based on methodology and recording sheets designed by the National Biodiversity Data Centre. Monitoring should be carried out between August and September when devils bit scabious in flower. The habitat suitability condition assessments should be carried out in Years 1, 3, 5, 7, 10, 15 and 20 of the Monitoring Plan. The results of the marsh fritillary breeding habitat suitablity assessments will inform whether adaptive management measures need to be introduced to improve the condition of the habitats for marsh fritillary. › Monitoring surveys will also include presence/absence surveys for marsh fritillary larvae initially in Blocks K and L and additionally in new breeding areas, i.e., Blocks C, F and H, throughout the Monitoring Plan. These will be carried out in accordance with best practice	As required. Years 1, 3, 5, 7, 10, 15, and 20 years	As required. Annually	Project Ecologist Project Ecologist

			guidance (NRA 2009) and the National Biodiversity Data Centre (NBDC) Marsh Fritillary survey methodologies for larval web surveys. The optimum survey period for larvae is during August and September, in sunny conditions. Occupied larval webs will be recorded. **Monitoring of Hedgerow and Native Woodland Establishment:** In order to facilitate the successful establishment of the new trees to be planted within the Proposed Wind Farm site, the following measures are proposed: › 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/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. 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. › Hedgerows and replanted 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 an Annual Monitoring Report (see Section 3.3 of the BMEP). **Cutover Peatland Enhancement Area:**	Annually	As Necessary	Project Ecologist

			The success of the measures in this area will be monitored throughout the Monitoring Plan periods prescribed as outlined above and will include vegetation relevés undertaken within the area. Fixed point 4 x 4 relevés with GPS coordinates and photos will be undertaken in both the cutover area (Block D) and within the immediately adjacent Article 17 mapped area. A minimum of 5 relevés from Block D will be recorded. The relevé data will be recorded in accordance with the methodology for cutover raised bog habitats set out in Smith et al (2020). The Project Ecologist will make recommendations as required within the Annual Environmental Report with regard to management measures or potential habitat condition improvements for Block D.	Annually	As Necessary	Project Ecologist
MX21	Birds	EIAR Chapter 7 Appendix 7-7	Survey methods employed for operational monitoring will be in line with guidelines issued by NatureScot (SNH, 2009) operational monitoring will be undertaken in operational Years 1, 2, 3, 5, 10 and 15 of the lifetime of the Proposed Wind Farm. Operational monitoring will include vantage point surveys and a programme of regular corpse searching of birds that may potentially collide with operating turbines during the operational phase of the wind farm project. Bird monitoring will include the following survey methods: › Flight activity surveys: monthly vantage point surveys › Targeted bird collision surveys (corpse searches) will be undertaken. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.	Years 1,2,3,5, 10 and 15	Monthly	Project Ornithologist
MX22	Noise and Vibration	EIAR Chapter 12	Operational noise surveys will be undertaken to ensure compliance with any noise conditions applied to the Proposed Wind Farm. It is common practice to commence surveys within six months of a wind farm being fully commissioned. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: *Post Completion Measurements* (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with	Once within six months	As Required	Noise Consultant

			the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 *Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.* For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure turbine noise levels are within the relevant noise criterion curves/planning conditions limits. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine performance. Following implementation of these measures, noise surveys can be repeated to confirm compliance with the noise criteria. Once compliance has been demonstrated, further surveys will not be necessary.			
Decommissioning Phase						
MX23	Decommissioning	Decommissioning Plan Section 1	As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore: *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".* In this regard, the Decommissioning Plan (DP) will be reviewed and updated prior to commencement of decommissioning works to take account of the relevant conditions of the planning permission and current health and safety standards at the time of decommissioning.	End of Operational Life	As Required	Developer Appointed/ Contractor
MX24	Decommissioning	Decommissioning Plan Section 3	The ECoW will maintain responsibility for monitoring the decommissioning works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters. The	End of Operational Life	As Required	Site Manager/ ECoW

			Site Manager will be responsible for reporting to and liaising with GCC and other statutory bodies as required.			
MX25	Decommissioning	Decommissioning Plan Section 3	The Site Manager in consultation with the ECoW will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	End of Operational Life	As Required	Site Manager/ ECoW
MX26	Decommissioning	Decommissioning Plan Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the Site to identify invasive species where any minor excavation will be required. If present in these areas, the ecologist will propose suitable management measures.	End of Operational Life	As Required	Project Ecologist
MX27	Health and Safety	Decommissioning Plan Section 4	› 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.	End of Operational Life	As Required	PSCS
MX28	Birds	Appendix 7-7	› It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible to avoid the most sensitive time of the year for most bird species with the potential to use the Proposed Wind Farm site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of decommissioning works at the Proposed Wind Farm site to identify sensitive sites (e.g. roosts). › Any requirement for decommissioning works to run into the subsequent breeding or winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding or roosting birds of conservation concern. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). The survey will aim to identify sensitive sites (e.g., nests or roosts depending on the season in question). › This monitoring will involve surveying onsite and to a 500m radius of the Proposed Wind Farm footprint/works areas. Monitoring will be undertaken by a suitably qualified ornithologist. The survey period will include one month prior to the initiation of works, four visits between	End of Operational Life	As Required	Project Ornithologist

			April and July and one visit during the winter period (October). If breeding or roosting activity is identified, the nest/roost sites will be located, and no works shall be undertaken within a species-specific buffer in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works within the buffer zone shall be permitted until it can be demonstrated that the species is no longer reliant on the nesting or roosting areas. › 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 off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.			

9. PROGRAMME OF WORKS

9.1 Construction Schedule

The construction phase will take approximately 18-24 months to complete from starting on site to the commissioning of the electrical system and export of electricity from site.

The EIAR stipulates that in the interest of breeding birds, construction will not commence during the breeding bird season, which runs from 1st March to 31st August. The EIAR stipulates that construction may commence between September and the end of 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.

Works during the construction phase of the development, including delivery of construction materials will generally take place between 7 a.m. and 7 p.m. daily Monday to Saturday with large concrete pours requiring an earlier start when deemed necessary. Delivery of abnormal loads such as turbine tower sections and blades will take place at night outside of peak traffic hours.

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

Table 9-1 Indicative Construction Schedule

		Year 1				Year 2			
ID	Task Name	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety								
2	Grid Connection								
3	Site Compounds								
4	Site Roads								
5	Substation and Electrical Works								
6	Turbine Hardstands								
7	Turbine Foundations								
8	Backfilling and Landscaping								
9	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 ECoW 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 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 ECoW on behalf of the Project Developer, in an and 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 ECoW 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 ECoW within the EMP. The findings of each audit will be made available to Galway County Council 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 Proposed Project:

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.

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) 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 Environmental Clerk of Works. 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 Site ECoW 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 ECoW on behalf of the Project Developer whenever a revised version of the CEMP is presented for approval.