

Appendix 4-3 Construction and Environmental Management Plan

Meenbog Wind Farm, Co.
Donegal



Table of Contents

1.	INTRODUCTION.....	1
1.1	Scope of the Construction and Environmental Management Plan	3
1.2	Targets and Objectives	3
2.	SITE AND PROSPECTIVE DEVELOPMENT DETAILS	5
2.1	Site Location.....	5
2.1.1	Wind Farm Site.....	5
2.1.2	Grid Connection Site	6
2.1.3	BMEP Site	6
2.2	Prospective Development Layout	6
2.3	Construction Management Practices Overview	10
2.3.1	Introduction	10
2.3.2	Overview of Proposed Construction Management Practices	10
2.3.3	Prospective Development Components.....	11
2.3.3.1	Turbine Foundations.....	11
2.3.3.2	Hard Standing Areas	13
2.3.3.3	Meteorological Mast Foundation.....	14
2.3.3.4	Site Roads	14
2.3.3.5	Borrow Pits.....	19
2.3.3.6	Site Drainage System	23
2.3.4	Site Entrance Management.....	23
2.3.4.2	Watercourse/ Culvert Crossings.....	24
2.3.4.3	Peat and Spoil Management Areas.....	25
2.3.4.4	Dedicated Peat Storage Cell (T18)	26
2.3.4.5	Temporary Construction Compounds	26
2.3.4.6	Biodiversity Management and Enhancement Measures.....	27
2.3.4.7	Tree Felling and Vegetation Removal.....	29
2.3.4.8	Tree Felling/ Replanting.....	29
2.3.4.9	Underground Electrical (33kV) and Communication Cabling.....	30
2.3.5	Wind Farm Site Amenity Areas	31
2.3.5.1	Timber Boardwalk	31
2.3.5.2	Pedestrian Gravel Track.....	32
3.	ENVIRONMENTAL MANAGEMENT.....	34
3.1	Introduction.....	34
3.2	Protecting Water Quality	34
3.2.1	Good Environmental Management During Construction	34
3.2.2	Legislation and Best Practice Guidance	34
3.2.3	Site Drainage	35
3.2.3.1	Drainage Design Principles.....	35
3.2.3.2	Site Drainage Design and Management	37
3.2.3.3	Preparative Site Drainage Management	41
3.2.3.4	Pre-emptive Site Drainage Management.....	41
3.2.3.5	Reactive Site Drainage Management.....	41
3.2.3.6	Operational Phase Drainage	42
3.2.3.7	Cable Trench Drainage.....	42
3.2.3.8	Rainfall Forecasting and Monitoring	42
3.2.4	Refuelling, Fuel and Hazardous Materials Storage.....	43
3.2.5	Cement Based Products Control Measures	44
3.2.6	Tree Felling Drainage Measures	46
3.3	Archaeological Management	48
3.4	Traffic Management	50
3.4.1	Turbine and Materials Transport Route	50
3.4.1.1	Wind Farm Site	50
3.4.1.2	Grid Connection Route.....	50
3.4.2	Traffic Mitigation Measures During the Construction Stage.....	50
3.5	Dust Control	51
3.6	Noise Control.....	52
3.6.1	Operational Noise	54

3.7	Invasive Species Management	54
3.8	Management of Bird Species/Habitats	55
3.8.1	Site Management.....	56
3.8.2	Establish Good Site Hygiene.....	56
3.9	Waste Management	57
3.9.1	Legislation	57
3.9.2	Waste Management Hierarchy.....	57
3.9.3	Construction Phase Waste Management.....	58
3.9.3.1	Description of the Works.....	58
3.9.3.2	Waste Arising and Proposals for Minimisation, Refuse and Recycling of Construction Waste	59
3.9.3.3	Waste Arising from Construction Activities	59
3.9.3.4	Waste Arising from Decommissioning	59
3.9.3.5	Reuse.....	60
3.9.3.6	Recycling	60
3.9.3.7	Implementation.....	61
3.9.3.8	Waste Management Plan Conclusion	62
4.	ENVIRONMENTAL MANAGEMENT IMPLEMENTATION.....	63
4.1	Roles and Responsibilities.....	63
4.1.1	Construction Manager	64
4.1.2	Site Environmental Clerk of Works	64
4.1.3	Project Ecologist/Ornithologist.....	65
4.1.4	Project Hydrologist.....	65
4.1.5	Project Archaeologist.....	66
4.1.6	Project Geotechnical Engineer/Civil Engineer	66
4.2	Water Quality and Monitoring.....	66
4.2.1	Pre-Construction Baseline Monitoring.....	66
4.2.2	Construction Phase Monitoring	67
4.2.2.1	Daily Visual Inspections.....	67
4.2.2.2	Continuous Turbidity Monitoring	67
4.2.2.3	Laboratory Analysis.....	67
4.2.2.4	Field Monitoring.....	68
4.2.2.5	Monitoring Parameters	68
4.2.3	Construction Phase Drainage Inspections & Maintenance	68
4.2.4	Surface Water Monitoring Reporting.....	69
4.3	Environmental Awareness and Training.....	69
4.3.1	Environmental Induction.....	69
4.3.2	Toolbox Talks.....	69
5.	HEALTH AND SAFETY	71
6.	EMERGENCY RESPONSE PLAN.....	73
6.1	Overview	73
6.1.1	Roles and Responsibilities.....	73
6.1.2	Hazard Identification.....	74
6.1.3	Site Evacuation/Fire Drill.....	75
6.1.4	Spill Control Measures	75
6.1.5	Contingency Measures – Peat Slide	76
6.1.5.1	Excessive Movement.....	76
6.1.5.2	Onset of Peat Slide.....	76
6.1.5.3	Check Barrages.....	77
6.2	Contacting the Emergency Services.....	78
6.2.1	Emergency Communications Procedure	78
6.3	Contact Details.....	78
6.4	Procedure for Personnel Tracking.....	79
6.5	Induction Checklist.....	79
7.	MITIGATION PROPOSALS.....	80
8.	MONITORING PROPOSALS.....	170
9.	PROGRAMME OF WORKS.....	200
9.1	Construction Schedule.....	200



10.	COMPLIANCE AND REVIEW	201
10.1	Site Inspections and Environmental Audits	201
10.2	Auditing.....	201
10.3	Environmental Compliance	201
10.4	Corrective Action Procedure	202
10.5	Construction Phase Review	202

1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been prepared by MKO on behalf of Planree Ltd. (the Applicant) who intends to apply to An Coimisiún Pleanála (ACP) for Substitute Consent under Section 177E of the Planning and Development Act 2000 (as amended) ('the Act') for the Subject Development.

The substitute consent application seeks to regularise the Existing Development and seeks permission for the Prospective Development. The Existing Development is addressed within the remedial Environmental Impact Assessment Report (rEIAR), which accompanies this planning application. The Prospective Development is addressed within this Environmental Impact Assessment Report (EIAR).

As detailed in Section 1.1.1 in Chapter 1 of the EIAR, the various development components are described and assessed using the following references: 'Subject Development', 'Existing Development', 'Prospective Development', 'Permitted Development', 'Site', 'Wind Farm Site', 'Grid Connection Site', 'BMEP Site', 'Grid Connection', 'November 2020 Peat Slide', '2017 EIAR' and 'proposed turbines' or 'proposed turbine locations'.

The Prospective Development for which permission is being sought consists of the following:

1. 19 no. wind turbines, with an overall tip height of 156.5m, rotor diameter of 133m, and wind turbine hub height of 90m, and 1 no. meteorological mast with a height of 80m, and subsequent decommissioning of the wind turbines and meteorological mast, following a twenty five-year operational period from the date of full commissioning of the wind farm;
2. The completion of upgraded access junctions, tracks and roads, and construction of new site access roads;
3. The completion of construction of all 19 no. wind turbine foundations and hardstand areas, and the construction of a meteorological mast foundation;
4. Completion of internal wind farm underground ducting and cabling;
5. Continued use of and upgrade of 2no. temporary construction compounds (including 3 no. temporary site offices with a combined floor area of 121.5 sqm);
6. Continued use and extraction at the 3no. borrow pits;
7. Peat and spoil management, including site landscaping;
8. Forestry felling;
9. Site drainage and sediment control measures;
10. Biodiversity enhancement measures (including peatland habitat restoration and Hen Harrier habitat areas);
11. Recreation and amenity works (including carpark, play, picnic & amenity areas and pedestrian access paths to the wind farm roads);
12. Operational stage site signage; and
13. All associated site development works.

Please note, a CEMP was prepared to accompany the 2017 EIAR and its associated planning application (ACP Ref. PA05E.300460), subject to conditions outlined as part of the grant of permission. The CEMP was issued to Donegal County Council for planning condition compliance in 2019 prior to the commencement of construction (the 2019 CEMP), and was used to guide construction works throughout the construction phase of the Existing Development, supplemented with Risk Assessment Method Statement(s) (RAMS) prepared by the contractor, under the supervision of the Project Design Engineer, Ionic Consulting. This CEMP has been prepared with reference to the 2019 CEMP, relevant RAMS, Appendix 4-2: Peat and Spoil Management Plan of the EIAR, and recommendations in the EIAR.

Following the 2020 Peat Slide on site, a Fehily Timoney (FT) report 'Peat Stability Assessment of Meenbog Wind Farm Site' (FT, 2021) was prepared to address the stability of the site following the peat failure. Appendix E of this document includes Construction Control Procedures which outlines the

response to the individual mitigation measures set out in the FT, 2021 report, and which will be applied to the remaining on-site civil works during construction. These procedures were agreed with the Environmental Protection Agency (EPA), and will be followed during construction of the Prospective Development, please see Section 2.3 below. A copy of this report, including Appendix E, is provided in Appendix 8-2 of the EIAR.

In addition to the aforementioned documents, this CEMP has been prepared in conjunction with the EIAR and the NIS which accompany the planning application to the competent authority. Should the Prospective Development 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 Prospective Development.

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 subject development;
- 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 preparation, construction and operation. The Contractor, as appointed by the 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 Prospective Development, but all future iterations must meet or exceed the standards and requirements set out in this document and the 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 Prospective Development, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, Developer and Contractor alike. It will be the contractor's current version of the CEMP, together with the Contractor's updated RAMS, 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 Prospective Development.

A detailed description of the Prospective Development 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 Prospective Development 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 Prospective Development.

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 Prospective Development 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 Prospective Development.

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 Prospective Development, 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 Prospective Development, 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 Prospective Development 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 housekeeping 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 PROSPECTIVE DEVELOPMENT DETAILS

2.1 Site Location

The Site, which comprises three distinct elements – the Wind Farm Site, the Grid Connection Site, and the BMEP Site, measures approximately 1,018 hectares (ha) within the townlands of Meenbog, Croaghonagh, Ardinawark, Keadew Upper, Keadew Lower, Cullionboy, Cashelnavean, Tawnawully Mountains, Friarsbush and Tievecloghoge, as described in Chapter 1 Introduction of the EIAR.

Construction work commenced at the Wind Farm Site and Grid Connection Site in November 2019. The majority of the civil engineering works, including wind farm access roads, turbine hardstands, turbine foundations, borrow pits and peat cells, were substantially completed over a 12-month period up to November 2020. Works on the electricity substation and associated underground cabling connection to the national grid continued until the second quarter of 2021. Construction work resumed briefly between July 2022 and September 2022, during which some additional works were carried out on site roads, internal site ducting, hardstanding areas, borrow pits, and peat cells.

2.1.1 Wind Farm Site

The Wind Farm Site, which refers to the area of the Site surrounding the wind turbines and associated infrastructure (including the onsite 110kV substation) from the Wind Farm Site entrance off the N15 National Road, is located in County Donegal, approximately 8 km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12 km northeast of Donegal Town.

The Wind Farm Site covers an area of approximately 892 ha, within the townlands of Meenbog and Croaghonagh. The Wind Farm Site borders County Tyrone in Northern Ireland, specifically the administrative division of Omagh West, Barony of Termonamongan and the townlands of Slievadoo, Meenakeeran, and Sixth Corgary or Second Croagh along the Southeast of the Wind Farm Site boundary. The Wind Farm Site lies within four Electoral Divisions (EDs); Golland, Dooish, Tawnawully and Clogher, in County Donegal. Current land-use at the Wind Farm Site is comprised of the partially constructed Meenbog Wind Farm and areas of commercial forestry and blanket bog. The surrounding land-use predominantly comprises peat bogs, commercial forestry and other seminatural areas with limited residential use along local roads, as well as a quarry adjacent to the Wind Farm Site entrance off the N15 National Road.

The elevation of the Wind Farm Site is between approximately 180 metres above Ordnance Datum (mOD) and 313 mOD, with elevations on the Wind Farm Site generally decreasing and sloping in a north or north-westerly direction. A small section to the south of the Wind Farm Site slopes to the southeast. The Wind Farm Site is generally bordered on all sides by forestry plantations, with the southeastern boundary also being defined by the Northern Ireland border. The Wind Farm Site drains directly to the Bunadown River and the Shruhanganarve stream, which flow to the north, each of which are tributaries of the larger Mourne Beg River that proceeds to flow downstream into the River Derg. The Wind Farm Site also drains into the Glendergan River to the south-southeast, which is also a tributary of the River Derg.

Existing access is from the N15 National Road in the northwest of the Wind Farm Site and the L-6554 Local Road to the north of the Wind Farm Site. The N15 National Road runs south-west to north-east with the Wind Farm Site lying to the east of the road.

There are 3 no. habitable houses located within one kilometre of the proposed turbine locations, the closest being a holiday cottage located 750 metres (m) northwest of the nearest proposed turbine location.

2.1.2 Grid Connection Site

The Grid Connection Site has a total area of approximately 9 ha and extends from the Wind Farm Site entrance along the N15 National Road to the Clogher 110kV substation, approximately 6.5 km southwest of the onsite 110kV substation. Within the Grid Connection Site, the Grid Connection underground cabling route originates at the onsite 110kV substation within the Wind Farm Site and travels to the northwest along an existing wind farm access road. The Grid Connection then exits the Wind Farm Site entrance and follows the N15 southwest for approximately 6 km, before exiting the N15 National Road onto the L-2595 Local Road. It is then routed southeast along the L-1985 Local Road and through agricultural lands adjacent to the L-1985 before continuing along and adjacent to a private road to reach the Clogher 110kV substation.

The Grid Connection Site traverses the townlands of Ardinawark, Keadew Upper, Keadew Lower, Cullionboy, Cashelnavean, Tawnawully Mountains and Friarsbush.

2.1.3 BMEP Site

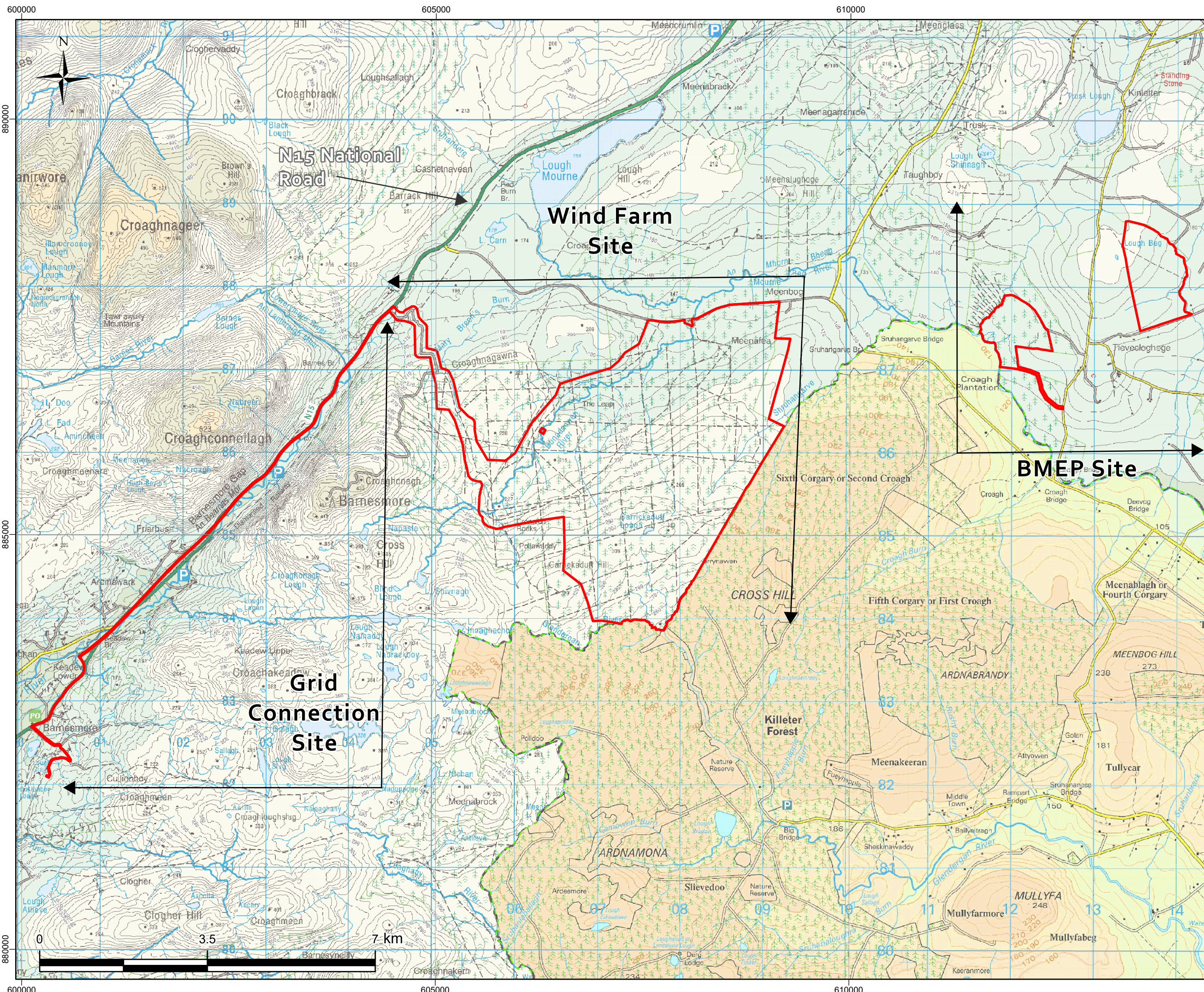
The Biodiversity Management and Enhancement Site (BMEP Site) covers an area of approximately 117 ha. The BMEP Site is comprised of two parcels of land both contained entirely within the townland of Tievecloghoge, referred to as Parcel 1 (to the east) and Parcel 2 (to the west), which have a combined area of approximately 117 ha, ~108 ha of which are intended for enhancement. Land use on the BMEP Site within Parcel 1 and Parcel 2 currently comprises coniferous forestry and associated forestry access tracks, which is proposed to be felled and converted to peatland and scrub habitats. Site access to Parcel 1 is via a new access track located along the L-65242 Local Road, whilst site access to Parcel 2 is via an existing access track (to be extended and upgraded) located along the L-2974 Local Road. Parcel 2 is located approximately 2.3km east of the Wind Farm Site, and Parcel 1 is located approximately 4.2km east of the Wind Farm Site. There is an elevation difference of 4m (174 mOD elevation SW to 170 mOD elevation NE) on the BMEP Site.

A summary of the proposed enhancement/restoration measures to be undertaken at the BMEP Site is provided in Appendix 6-4 Biodiversity Management and Enhancement Plan of the EIAR.

2.2 Prospective Development Layout

A full and detailed description of the Prospective Development for the purposes of the planning application and the additional elements that form part of the overall project, assessed in the EIAR, is contained in Chapter 4: Description of the Prospective Development of the EIAR.

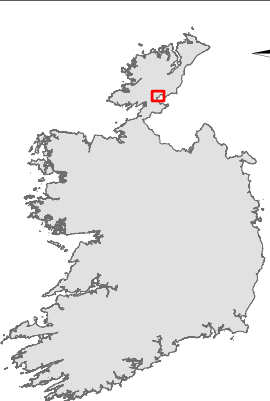
The Prospective Development location is illustrated in Figure 2-1 below. This figure shows the location of the Wind Farm Site, Grid Connection Site, and BMEP Site respectively and. Figure 2-2 illustrates the components of the Wind Farm Site, including the locations of the proposed wind turbines, wind turbine foundations and hardstand areas requiring upgrade or completion, meteorological (met) mast, internal access roads requiring both minor works and upgrades and more substantial works and upgrades, peat and spoil management areas (including landscaping and a peat cell at T18), borrow pits, temporary construction compounds, internal wind farm cabling and ducting, recreation and amenity areas, forestry felling areas, site drainage, and the site entrance. Detailed site layout drawings of the Prospective Development are included in Appendix 4-1 to the EIAR. The components of the BMEP Site are illustrated in Figure 2-3.



Map Legend

- Planning Application Boundary
- Co. Donegal/Northern Ireland Boundary

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator



SITE LOCATION - NOT TO SCALE

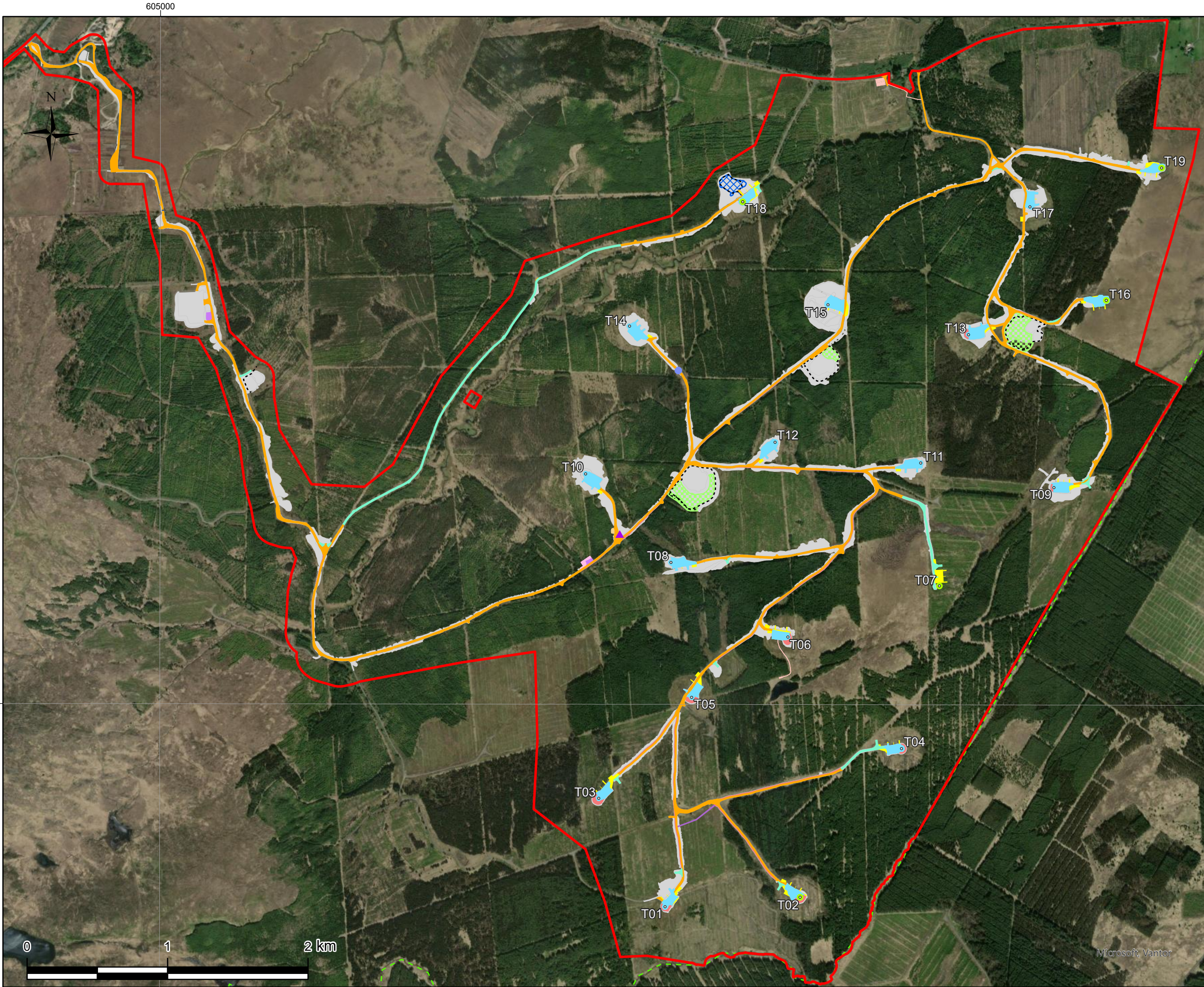
Site Location

Project Title
Meenbog Wind Farm, Co. Donegal

Project No. 240505g	Drawing No. 2-1	Scale 1:72,500
Drawn By KB	Checked By RK	Date 29/06/2026



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



Map Legend

Planning Application Boundary

Turbine Layout

Proposed Turbine Foundation

Hardstand Minor Works & Upgrades

Hardstand More

Substantial Works & Upgrades

Roads Minor Works & Upgrades

Roads More

Substantial Works & Upgrades

Temporary Construction Compound

Proposed Extension to Temporary Construction Compound

Borrow Pit

Peat Cell

Landscaping

Proposed Berm

Proposed Amenity Infrastructure

Proposed Met Mast

Concrete Washout Area

Proposed Fencing

Field Gate

Proposed Culvert Upgrade

Existing Development Footprint

Co. Donegal/Northern Ireland Boundary

Wind Farm Site Roads

Roads Minor Works & Upgrades

Roads More

Substantial Works & Upgrades

Temporary Construction Compound

Temporary Construction Compound

Proposed Extension to Temporary Construction Compound

Amenity Area

Proposed Amenity Infrastructure

Ancillary Infrastructure

Proposed Met Mast

Concrete Washout Area

Proposed Fencing

Field Gate

Proposed Culvert Upgrade

Existing Development

Existing Development Footprint

Co. Donegal/Northern Ireland Boundary

Spatial Reference
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Datum: IREN95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Wind Farm Site Layout

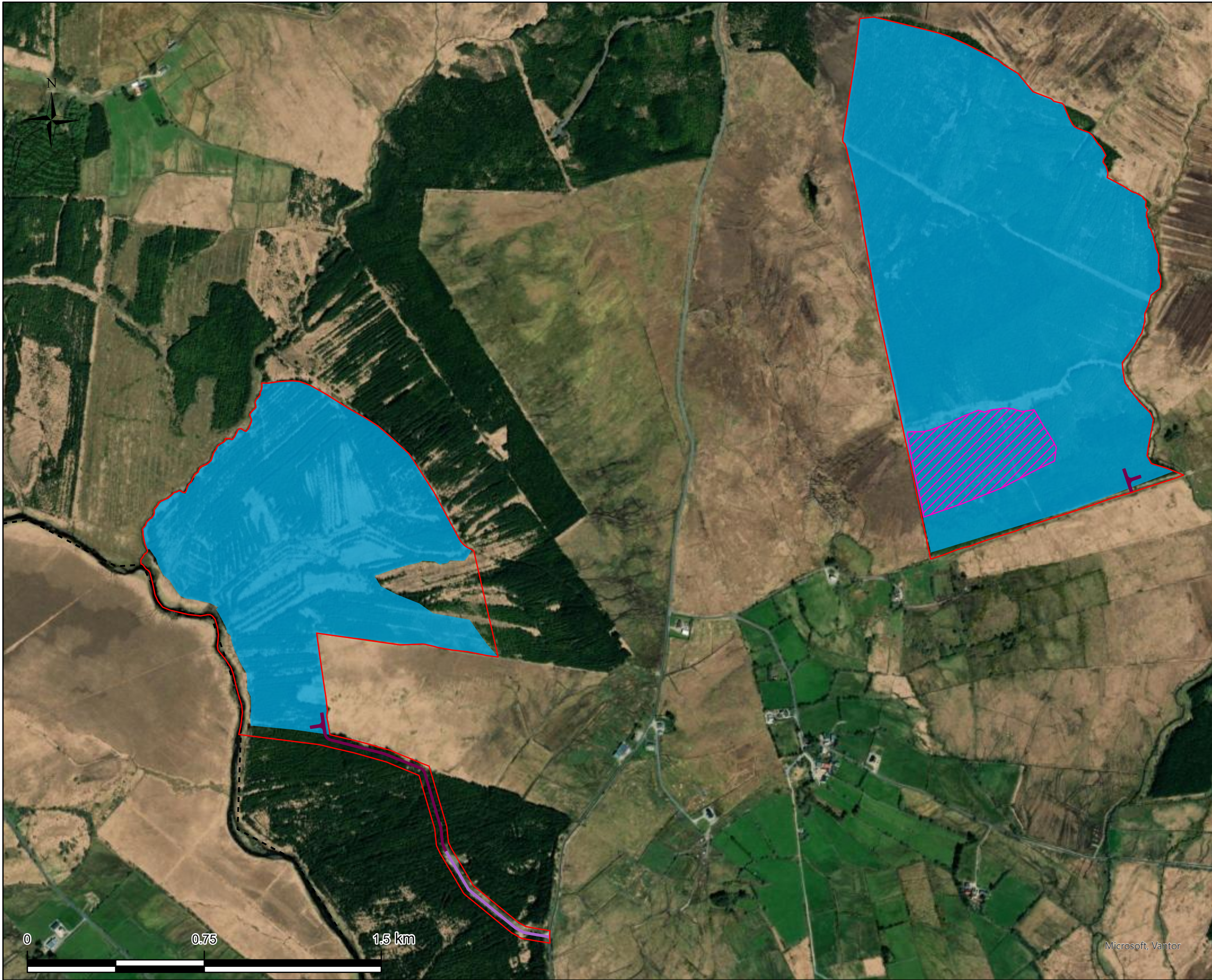
Project Title

Meenbog Wind Farm, Co. Donegal

Project No.	240505g	Drawing No.	2-2	Scale	1:25,000
Drawn By	KB	Checked By	RK	Date	11/06/2026

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Map Legend

□ Planning Application Boundary

BMEP Site

■ Proposed Hen Harrier Habitat Enhancement Lands

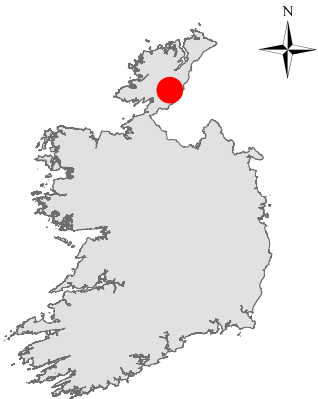
▨ Proposed Peatland Restoration Area

■ Existing Forestry Track Upgrade

■ Proposed New Forestry Track

--- Co. Donegal Boundary

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator



SITE LOCATION - NOT TO SCALE

Drawing Title

BMEP Site Layout

Project Title

Meenbog Wind Farm, Co. Donegal

Project No.	Drawing No.	Scale
240505g	2-3	1:15,000
Drawn By	Checked By	Date
KB	RK	28/05/2026



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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 Prospective Development. 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 Prospective Development. 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 Prospective Development. Detailed construction methodologies are reproduced in the relevant sub-sections but will be superseded by any updated RAMS by the appointed Contractor, 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 RAMS will be prepared to take account of the detailed engineering, geotechnical and detailed drainage design for the Prospective Development, and all requirements of this CEMP.

Prospective Development Elements:

- Turbine Foundations
- Turbine Hardstanding Areas;
- Meteorological Mast Foundation, and hardstanding area;
- Site Roads (new site roads and upgrade to existing roads onsite);
- Continued use and extension of existing Borrow Pits;
- Site Drainage System;
- Site Entrance Management;
- Watercourse/Culvert Crossings;
- Peat and Spoil Management;
- Extension of existing on-site Temporary Construction Compound;
- Tree Felling and Replanting;
- On-site recreation and amenity proposals;
- Biodiversity Management and Enhancement Measures;
- Underground Electrical (20/33kV) and Communication Cabling; and,
- Existing Substation and Grid Connection maintenance works

Following the November 2020 Peat Slide, a comprehensive review of the construction methodologies being employed on-site was undertaken by Fehily Timony as part of the response to the EPA investigation of the peat slide. Following this review a document *entitled 'Construction Responses to Fehily Timony Mitigation Measures'*, was prepared by the contractor (MCE Ltd.) in August 2021 (MCE, 2021) to accompany the Fehily Timoney report *'Peat Stability Assessment of Meenbog Wind Farm Site'* (FT, 2021). The MCE (2021) document outlined additional mitigation measures and revised construction methodologies to be utilised during the construction of the outstanding elements required to complete the wind farm. These measures and methodologies were implemented for all construction activities undertaken on-site since the publication of the MCE (2021) document and have been applied to the construction methodologies for the Prospective Development outlined below and within this CEMP. A copy of *'Peat Stability Assessment of Meenbog Wind Farm Site'* (FT, 2021) is included as Appendix 8-2 of the EIAR.

Table 2-1 Lessons learned and accompanying mitigation measures (Table 20 of 'Construction Responses to Fehily Timony Mitigation Measures' (2021))

Peat Stability - Lessons learned	Mitigation Measures
Excessive loading of insitu peat	➤ No further construction of floating roads on the Wind Farm Site is to be carried out. Given the potential risk associated with floating road construction alternative methods of construction shall be adopted. ➤ No loading of insitu peat. The instability recorded on site in all cases can be contributed to various degrees to excessive placed construction loading onto the insitu peat surface.
Identifying body of weak peat in proximity to proposed works	➤ Confirmatory re-testing and assessment in zone of influence in advance of construction works. The peat failure of 12 November 2020 occurred due to an unforeseen body of very weak peat adjacent to the working area. Further confirmatory re-testing to be completed immediately prior to works recommencing in each area of site to ensure no change in ground conditions.
Accidental excessive loading of insitu peat during construction	➤ Site supervision and permit to work with respect to peat stability. All construction on site shall be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety.
Identifying areas of potential weak peat in advance of works completion of works	➤ Monitoring of ground movement and constructed works. In order to monitor the performance of the constructed works within the peat areas, and any further construction works to be carried out, a series of monitoring points shall be established throughout the site. ➤ Proof testing of floating roads. Full-scale proof load tests to be carried out on floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road.
Degradation of work due to inclement weather	➤ Construction and weather conditions. Restrictions on work during or after periods of heavy or sustained rainfall. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure.

2.3.3 Prospective Development Components

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 is dictated by the selected turbine model (Nordex N133/4.8) and the specific requirements of the turbine manufacturer. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of the turbine foundation will be 22.5m and ~3m respectively, which has been assessed in the EIAR.

A total of 14 no. wind turbine foundations have been completed or predominantly completed, where the foundation concrete pour has been completed and only partial backfilling and/or covering works are outstanding. As such, any remaining works required for the 14 no. turbine foundations will be completed as part of the Prospective Development. In the case of 5 no. turbine foundations where more substantial works are required, these works are also proposed to be completed or constructed as part of the Prospective Development. The locations of the remaining foundations to be completed, and a brief description of the outstanding works are listed in 4-3 of the EIAR.

After the foundation level of each turbine has been formed on competent stratum (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 formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to the top of formwork level, to support the concrete pour. It is anticipated that the formation level of the T7 turbine foundation will be on the lower mineral subsoil or bedrock. It will be formed at a suitable level directed by the Geotechnical Engineer/Designer. The foundation 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. *No material will be removed from the Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas (i.e. the existing borrow pits and the peat cell at T18) within the Wind Farm Site, or used for landscaping purposes within the Wind Farm Site.*
3. *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;*
4. *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;*
5. *The foundation 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.*
6. *The remaining works on the site shall be carried out without placing of any arisings or loading on to the insitu peat. Placing of any load particularly onto the downslope margin of any works within peat shall be avoided.*

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 rammers 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. Material stored in the borrow pits may be used for landscaping at the turbine bases, if required; and.*

9. *No excavated material will be removed from the Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Site, (i.e. the existing borrow pits and the peat cell at T18).*

2.3.3.2 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. Each hard standing area includes a crane assist pad which is a safety tool used under the cranes to distribute the load over a larger area and enhance stability. These pads are essential for preventing the ground underneath the installation crane equipment from shifting. Overall, 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 Prospective Development includes works to all 19 no. turbine hardstanding areas. The works required to complete each hardstand area are outlined in Table 4-4 of the EIAR. Planning drawings of the hardstanding areas are included in Appendix 4-1 of the EIAR.

Of the 19 no. hardstanding areas required, 18 no. are partially constructed, whilst one hardstanding area T07 requires all works to be completed.

The outstanding works at the turbine hardstanding areas have been broadly divided into two categories; (a) minor works and upgrades, and (b) more substantial works and upgrades. Minor works and upgrades comprise capping and/or grading and/or stockpile usage. More substantial works and upgrades include the construction of crane assist pads, blade fingers, hardstand extensions, as well as all civil works which are required at T7. The more substantial works and upgrades all require some level of groundworks and are therefore considered to be more substantial. A mixture of both categories is required at all 18 no. partially constructed hardstanding areas. The works at T7 all comprise more substantial works and upgrades.

Capping and grading material is a layer of material placed on top of other construction layers of materials, to provide a level running surface for cranes and delivery vehicles. Regarding stockpile usage, a stockpile of rock has been stored at several hardstands for later use. It is proposed that these stockpiles will be used for hardstand and road construction.

Capping and grading material is a layer of material placed on top of other construction layers of materials, to provide a level running surface for cranes and delivery vehicles. Regarding stockpile usage, a stockpile of rock has been stored at several hardstands for later use. It is proposed that these stockpiles will be used for hardstand and road construction within the Wind Farm Site.

Hardstanding areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. Overall, the hardstanding 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. Each hardstanding area includes crane assist pads which are required for smaller cranes to assist the main crane. The hardstanding areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas have been designed taking account of the loadings provided by the turbine manufacturer and consist of a compacted stone structure. Blade storage fingers will provide temporary set-down or storage areas for turbine blades at each hardstanding area.

The proposed hardstanding areas are illustrated in the planning drawings included in Appendix 4-1 of the EIAR. The extent of the required areas at each turbine location are 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 Prospective Development. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E606893, N885701 (ITM) as shown on the Prospective Development 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 80m 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. The proposed meteorological mast is shown in Figure 4-7 of the EIAR.

The met mast foundation will be formed at a suitable level directed by the Geotechnical Engineer/Designer. The met mast will be located on an existing hardcore area within the Wind Farm Site. The foundation area will be prepared as follows:

1. *The met mast will be installed on an existing hardcore area. Works will be limited to the construction of the met mast foundation and any localised preparation required to facilitate its installation.*
2. *All groundwater and surface water arising from met mast base excavation will be pumped to the dirty water system prior to discharge from the works area;*

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 provide access within the Wind Farm Site and to connect the proposed turbines and associated infrastructure existing roads will need to be upgraded. The road construction preliminary design has taken into account the following key factors, as outlined in the *Peat and Spoil Management Plan* in Appendix 4-2 of the EIAR:

1. Buildability considerations
2. Maximising use of existing infrastructure
3. Minimising excavation arisings
4. Peat stability
5. Serviceability requirements for construction and wind turbine delivery and maintenance vehicles
6. Requirement to minimise disruption to peat hydrology

The above key factors are used to inform the road design which is determined by the prevailing ground conditions encountered along that length of road. Appendix 4-2 of the EIAR includes the most suitable type of road construction envisaged for each section of access road based on the ground/site conditions recorded during the site walkovers and intrusive site investigation works.

The Prospective Development includes for the operational use of the onsite roads (following completion), and regular maintenance of the roads over the operational period of the Subject Development.

The general road construction techniques for road upgrade works at the Wind Farm Site and BMEP Site are listed below, with further details provided in Appendix 4-2 Peat and Spoil Management Plan of the EIAR:

- Upgrade of existing founded access roads (Wind Farm Site)
- Upgrade/replacement of existing floated road to founded road (Wind Farm Site)
- Upgrade of existing floated access road (Wind Farm Site)
- Upgrade of existing floated forestry track (BMEP Site)
- New floating forestry access track (BMEP Site)

2.3.3.4.1 Wind Farm Site roads

Approximately 19 km of existing access roads are present across the Wind Farm Site and have been in operation for a number of years, some of which were pre-existing prior to construction of the Existing Development. The existing access roads have been constructed using both founded and floating construction techniques.

The outstanding works relating to site roads have been broadly divided into two categories, (a) minor works and upgrades, and (b) more substantial works and upgrades. Minor works and upgrades comprise grading and/or the laying of surface dressing, a degree of which is required along all existing site roads. The more substantial works and upgrades to access roads, requiring some level of groundwork, comprise the construction of new site roads including excavation and replacement of existing roads, widening or extension of existing roads, and construction of turning heads.

It is proposed to conduct more substantial works and upgrades along approximately 3 kilometres of site roads and tracks within the Wind Farm Site, which includes construction and upgrade works on sections of the access roads to turbines T18, T7 and T4, and widening at certain locations along the existing onsite roads. Table 4-1 of the EIAR includes an overview of the main works required to complete the Wind Farm Site access roads. It is also proposed to construct or complete 10 no. turning heads in the vicinity of a number of turbine locations, which comprise more substantial works and upgrades. The construction of turning heads is proposed in the vicinity of T01, T02, T03, T04, T05, T07, T09 and T18, and completion of partially constructed turning heads in the vicinity of T08 and T19, as shown in the planning drawing in Appendix 4-1 of the EIAR. The turning heads measure between approximately 16m x 6m and 30m x 6m depending on the access roads in the vicinity of each. It is proposed to construct passing bays along the access road to T18 in order to allow construction traffic to safely pass each other while travelling in opposite directions. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the Prospective Development.

Proposed upgrade and road widening works within the Wind Farm Site will be founded on competent stratum. Cross section details of the proposed upgrade of existing roads at the Wind Farm Site are shown in Figures 4-8 and Figure 4-9 of the EIAR.

It is proposed that all site roads have a minimum running width of 5 metres, with wider sections of up to 8m on bends and corners. As outlined within the rEIAR, the width of the constructed road (i.e. existing roads) varies between 5m and 10m.

Works to roads within the Wind Farm Site comprise upgrading existing founded access roads, replacing existing floating access roads with founded roads, and finishing of floating access roads which will be 'topped up' or finished with a thin layer of crushed rock, up to 0.15m in thickness. Drainage features along access roads are illustrated in Appendix 4-4 of the EIAR. Due to the ground conditions, and in line with the mitigation measures within 'Peat Stability Assessment of Meenbog Wind Farm Site' (FT, 2021), *'no further construction of floating roads is to be carried out [within the Wind Farm Site]. Given the potential risk associated with floating road construction alternative methods of construction shall be adopted.'* No new floating access roads are proposed within the Wind Farm Site, however some of the previously constructed floating roads will be used in the construction of the Prospective Development within both the Wind Farm Site and the BMEP Site. The types of roads to be constructed across the Site are based on available guidance, including *'Constructed Tracks in the Scottish Uplands'*

¹(Scottish Natural Heritage, 2nd Edition, 2015), ‘*Floating Roads on Peat*’²(Scottish Natural Heritage/Forestry Commission Scotland,(2010) and ‘*Dealing with Bearing Capacity Problems on Low Volume Roads Constructed on Peat*’³(ROADDEX II, 2004).

For the locations around the section of floating road at the T01 and T02/T04 junction, a stabilising berm will be constructed downslope of the road to act as a mitigation measure to provide additional resistance to peat movement. As detailed in the Peat Stability Assessment Report (Appendix 8-1 of the EIAR), no peat instability is anticipated in this area as a result of the Prospective Works following these mitigation measures. Please note, Appendix 8-1: Peat Stability Assessment Report has been peer reviewed by Conor O'Donnell (BA, BAI, MS, FGS, CEng, MIEI, FConsEI) of AGL Consulting, which can be found in Appendix 4-7 of the EIAR.

The construction methodologies adopted for the main road construction/upgrade works within the Wind Farm Site have been determined by the ground and site conditions identified during the site walkovers and intrusive site investigation works, and are described in the Peat and Spoil Management Plan in Appendix 4-2 of the EIAR, and summarised below.

Upgrading of Existing Founded Access Roads

This methodology includes procedures that will be included in the construction phase to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations, which are discussed in Section 4.5 of the EIAR and in Chapter 9 of the EIAR. Please see Figure 4-8 of the EIAR for sectional details of this road upgrade type.

1. Access road construction will be to the line and level requirements as per design/planning conditions.
2. For upgrading of all existing founded access roads the following will apply:
 - a. Excavation of the access road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill.
 - b. Benching of the excavation will be required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm.
 - c. Access roads will be finished with a layer of capping/surfacing material across the full width of the road.
 - d. For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability

Upgrade of Existing Floating Access Roads to Founded

As part of the Prospective Development, sections of existing floating access roads will be upgraded to founded roads, as illustrated in Figure 4-9 of the EIAR. These are described below. A section of the existing floating access road to T04 (comprising the final 210 m to the hardstand), as well as the section of existing floating access road to T07, will be excavated and replaced with a founded road. The existing floating forestry road to T18 will be excavated and replaced with a founded road. For the locations around the section of floating road at the T01 and T02/T04 junction, a stabilising berm will be constructed downslope of the road to act as a mitigation measure to provide additional resistance to

¹ Constructed Tracks in the Scottish Uplands’ (Scottish Natural Heritage, 2nd Edition, 2015)
<<https://www.nature.scot/doc/archive/constructed-tracks-scottish-uplands>>

² Floating Roads on Peat (Scottish Natural Heritage/Forestry Commission Scotland (2010) <<https://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf>>

³ Munro, R, 2004. Dealing with bearing capacity problems on low volume roads constructed on peat. Roadex II Northern Periphery <https://www.roadex.org/wp-content/uploads/2014/01/2_5-Roads-on-Peat_1.pdf>

peat movement, as described in the Peat Stability Assessment Report in Appendix 8-1 of the EIAR. Monitoring posts will be installed upslope and downslope of this area prior to construction works commencing, as detailed in Section 7 of Appendix 4-2: Peat and Spoil Management Plan of the EIAR.

1. *For upgrading of existing floating access roads previously constructed using a floated construction technique, the following will apply:*
 - a) *Daily monitoring of these monitoring posts will be undertaken while works are ongoing in specific areas.*
 - b) *The existing floating roads will be incrementally removed by pulling back the engineering fill material and base layer, before constructing the new road using the excavate and replace/partial displacement method.*
 - c) *The roads will be built incrementally, with peat removed before being backfilled with coarse rock sourced from the borrow pit where the peat is relatively shallow (<2m). The lateral extent of excavation will be limited to 3m (effective reach of an excavator) before being backfilled. The excavator will work from the road at all times and will not track or operate directly on the peat surface.*
 - d) *Rock fill from the borrow pit will be transported to the roads and berm using A25 dumpers, with the coarse rock tipped onto the constructed section of road before being used to backfill the excavation. Rock will not be end tipped directly from dumpers into the excavation.*
 - e) *Where areas of deeper or weaker peat are encountered, the partial displacement method is proposed. This removes the peat down to the stable depth of excavation but will leave a layer of peat in place at the base of the excavation.*
 - f) *Coarse boulders (>0.5m, with no fine material) will be used in the base of the excavation and will be pushed into the base of the weaker peat to the solid stratum below the peat. This displaces the peat upwards, filling the voids between the coarse boulder fill.*
2. *The finished road will have a minimum running width of 5m, with wider sections on bends and corners.*
3. *The construction of access roads in areas of deep peat (greater than 3m) will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/after trafficking by heavy vehicular loads.*

Upgrading Floating Access Roads

The existing floating access roads to T01, T02, T03 and T04 will be used for the construction of the Prospective Development. In these locations the existing roads will be 'topped up' with a thin layer of crushed rock, up to 150mm in thickness finished with a layer of selected granular fill. Monitoring posts will be installed upslope and downslope of this area prior to construction works commencing, as detailed in Section 7 of Appendix 4-2: Peat and Spoil Management Plan of the EIAR.

1. *Prior to any upgrading works, peat probing, hand shear vane testing and full-scale proof load testing will be carried out along each of the existing floating roads. See 'Peat Stability Assessment Report' in Appendix 8-1 of the EIAR for details.*
2. *Prior to commencing upgrade works 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.*
3. *The surface of the existing access road will be graded/tidied up prior to the placement any additional material.*
4. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. 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.*
5. *The construction of these access roads will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/after trafficking by heavy vehicular loads.*

2.3.3.4.2 BMEP Site Tracks

As outlined in the BMEP (Appendix 6-4 of the EIAR) and Section 2.1 above, access to Parcel 1 is via a new access track located along the L-65242 Local Road, whilst site access to Parcel 2 is via an existing access track (to be extended and upgraded) located along the L-2974 Local Road. The existing forestry track terminates after 350 m, and from this point it is proposed to construct approximately 550 m of new forest track to complete access to this parcel as part of the BMEP works. The existing forestry track will be upgraded by laying a new surface dressing on the existing section of roadway where necessary. A section of the proposed new road within the BMEP Site is provided in Figure 4-10 of the EIAR and a section of the upgrade to the existing forestry track within the BMEP Site is provided in Figure 4-11 of the EIAR. Please see below for the construction methodologies to be adopted at the BMEP Site.

The existing forest track will be upgraded by laying a new surface dressing on the existing section of roadway where necessary. The new forest track will be designed as '*Build On-Top Embankment Roads*' in accordance with the COFORD (2004) '*Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads*'. Floating roads minimise the impact on peat, particularly peat hydrology, and significantly reduce the volumes of peat requiring management as there is no excavation required and no peat arisings are generated.

Upgrade of Existing Floating Forestry Access Track

A single section of floating forestry access track on the BMEP Site will be widened and upgraded as a floating road to allow for forestry felling operations. The proposed location is shown on drawing P24-234-0602-0001 within Appendix 4-2: Peat and Spoil Management Plan of the EIAR and details shown on Figure 4-11 of the EIAR. The existing track comprises coarse crushed rock fill on a layer of tree brash. Peat depth in this area is less than 2m and the slope angle is less than 5 degrees. Monitoring posts will be installed upslope and downslope of this area prior to construction works commencing, as detailed in Section 7 Appendix 4-2: Peat and Spoil Management Plan of the EIAR. Peat probing and hand shear vanes testing will also be undertaken in advance of construction works commencing.

1. Prior to commencing floating access road construction movement monitoring posts will be installed and will be placed at 10m intervals along this track.
2. The surface of the existing access road will be scraped back to a depth of 250mm, and a layer of geogrid placed across the existing road and the widened section of the road.
3. The existing section of road will be overlain with a 150mm layer of selected granular fill.
4. The basal geogrid on the widened section will be overlaid with an average of 800mm of selected granular fill.
5. The finished road width will be approximately 4m, with wider sections on bends.
6. Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing road.
7. Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.
8. 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.
9. Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road.

New Forestry Access Track

A new floating forestry access track, approximately 550m in length, will be constructed in a single area on the BMEP Site. The proposed location is shown on drawing P24-234-0602-0001 within Appendix 4-2: Peat and Spoil Management Plan of the EIAR and details are shown on Figure 4-10 of the EIAR. Peat depth in this area is less than 2m and the slope angle is less than 5 degrees. Monitoring posts will be

installed upslope and downslope of this area prior to construction works commencing, as detailed in Section 7 Appendix 4-2: Peat and Spoil Management Plan of the EIAR.

This methodology includes procedures that are to be included in the construction to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations, which are considered in Section 4.5 of Chapter 4 of the EIAR, and Chapter 9 of the EIAR.

1. *Prior to commencing floating track construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
2. *Prior to any upgrading works, peat probing and hand shear vane testing will be undertaken along the route of the track.*
3. *Base geogrid will be laid directly onto the existing peat surface along the line of the track in accordance with geogrid provider's requirements.*
4. *The make-up of the new floated access track will be an average of 800mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator (Figure 4-10 of the EIAR).*
5. *Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2024).*
6. *The finished trackwidth will be approximately 4m, with wider sections on bends.*
7. *Stone delivered to the floating track construction will be end-tipped onto the constructed floating track. Direct tipping of stone onto the peat will not be carried out.*
8. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating track will be tipped over at least a 10m length of constructed floating road.*
9. *Where it is not possible to end-tip over a 10m length of constructed floating road then dumpers delivering stone to the floating track 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.*
10. *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the track.*
11. *A final surface layer will be placed over the full width of the floating track, as per design requirements, and graded to accommodate wind turbine construction and delivery traffic.*

2.3.3.5 Borrow Pits

As outlined in the Peat and Spoil Management Plan in Appendix 4-1 of the EIAR, it is estimated that approximately 74,180m³ of stone material will be required to complete construction of the Prospective Development. There are 3 no. partially excavated borrow pits within the Wind Farm Site which were established as part of the Existing Development. Continued use and/or extension of excavation works are proposed at these borrow pits as part of the Prospective Development. Table 4-5 of the EIAR outlines the intended extent of use of the borrow pits. It is intended to obtain the majority of materials for the construction of the Prospective Development from the onsite borrow pits. However, engineer's specified material may be imported onto the Wind Farm Site for should suitable quality material not be encountered during borrow pit excavation for the Prospective Development. It is estimated that up to ~8,000m³ of well-graded stone material (Cl804) for capping/finishing is required to complete the construction of the Prospective Development. Please note, this ~8,000m³ of well-graded material to be imported is in addition to the ~74,180m³ of stone material requirements for the Prospective Development outlined above. Access to each of these the borrow pits is already in place, via existing site roads. The borrow pits are described in more detail below, please note the area measurements provided below include the footprint of each borrow pit proposed as part of the Prospective Development in addition to the existing footprint (as illustrated in Figure 1-1 above), and as such will differ to the areas provided in Chapter 4 of the rEIAR.

2.3.3.5.1 **Borrow Pit 1 (BP1): East of Turbine T10**

Borrow Pit 1 is located approximately 395m east of T10. The ITM Coordinates of this borrow pit are X 607214, Y 885893. The total area of BP1 measures approximately 28,180m², where approximately 8,640m² of this is proposed to be utilised for extraction as part of the Prospective Development, within the existing pit extraction area/footprint. The remaining area measuring ~11,795m² has already been backfilled and thus will not be utilised during the Prospective Development works. Furthermore, no extension of the extraction area is proposed as part of the Prospective Development, however additional works to stabilise the slopes surrounding the existing borrow pit comprising tree removal, slope levelling, and fencing are proposed. The works area strip surrounding the borrow pit measures approximately 7,750m² with the proposed works along the southern/eastern edge of the existing borrow pit measures approximately 2,100m² and approximately 5,650m² which has already been built. Please see Figure 4-12 of the EIAR for an illustration of the layout of BP1 proposed as part of the Prospective Development.

2.3.3.5.2 **Borrow Pit 2 (BP2): South of Turbine T15**

Borrow Pit 2 is located approximately 170m south of T15. The ITM Coordinates of this borrow pit are ITM X 607757, Y 886389. The total area of BP2 measures approximately 14,000m², where approximately 2,180m² of this is proposed to be utilised for extraction as part of the Prospective Development, within the existing pit extraction area/footprint. The remaining area measuring approximately 8,850m² has already been backfilled and thus will not be utilised during the Prospective Development works. The borrow pit working strip, which has been constructed as part of the Existing Development, measures approximately 2,980m². Please see Figure 4-13 of the EIAR for an illustration of the layout of BP2 proposed as part of the Prospective Development.

2.3.3.5.3 **Borrow Pit 3 (BP3): East of Turbine T13**

Borrow Pit 3 is located approximately 175m east of T13. The ITM Coordinates of this borrow pit are ITM X 607757, Y 886389. The total area of Borrow Pit 3 measures approximately 19,000m², where approximately 6,000m² of this is proposed to be further utilised for extraction as part of the Prospective Development, within the existing pit extraction area/footprint. The remaining area measuring approximately 4,430m² has already been backfilled and thus will not be utilised during the Prospective Development works. In addition, it is proposed that this pit is extended to the west and south of its current footprint by an area of approximately 4,000m², meaning the total extraction area within BP3 for the Prospective Development would be approximately 10,000m². The works area strip surrounding the borrow pit measures approximately 5,210m² with the proposed works along the western/southern edge of the borrow pit extension measures approximately 3,445m² and approximately 1,120m² of which has already been built to the northern/eastern edge. Please see Figure 4-14 of the EIAR for an illustration of the layout of BP2 proposed as part of the Prospective Development.

2.3.3.5.4 **Borrow Pit Construction**

To prepare for extraction activities, water which has ponded at the borrow pit locations will be cleared through the use of pumping. The extraction of material from the borrow pits for the Prospective Development is a construction phase activity only and will be temporary and occur over a short period of time. Hardcore materials will be extracted from the borrow pit, by means of rock breaking or blasting. Depending on the hardcore volume, blasting may be used as a more effective rock extraction method, capable of producing significant volumes of rock in a matter of milliseconds. Both rock extraction methods are discussed below. The processing and crushing of boulders may be required to achieve the grading requirements for use in construction. The potential noise and vibration impact on sensitive receptors associated with the rock extraction measures, detailed below, are assessed in Chapter 12: Noise and Vibration, of the EIAR.

Upon removal of the rock from the borrow pits, it is proposed to reinstate the borrow pits using excavated peat and spoil. Once reinstatement is complete, the perimeter of the borrow pits will be permanently secured with a stock-proof fence erected around the borrow pit area to prevent access to these areas in the interest of health and safety. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced area.

At BP3, where an extension is proposed, the topsoil and subsoil stripping will be conducted in advance of excavation works within the extension area using standard tracked excavators. Any further material gathered during topsoil and subsoil stripping works will be stored within the existing borrow pit void. Two extraction methods have been assessed for breaking out the useful rock: rock breaking and blasting.

It should be noted that there are significant excavation works required in order to develop the extension to the existing borrow pit (BP3) at the Wind Farm Site. Excavation works will be undertaken and supervised by an experienced contractor and the Project Geotechnical Engineer. The text below provides design and construction guidelines for the borrow pit.

Figures 4-12 to 4-14 of the EIAR show plan and cross sections of the borrow pits.

The text below provides design and construction commitments for the borrow pits:

1. *Peat and overburden will be removed and stored within the void at the existing borrow pits. The rock within the proposed borrow pit footprint will be removed by breaking and blasting.*
2. *It is proposed to construct the borrow pits so that the base of the borrow pits are below the level of the adjacent section of access road.*
3. *Slopes within the excavated rock formed around the perimeter of the borrow pits will be formed at stable inclinations to suit local in-situ rock conditions. Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance.*
4. *The stability of the rock faces within the borrow pits will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines.*
5. *It will be necessary to construct rock buttresses within BP3 to create individual cells (up to 3 no. as required). The cells will be opened in sequence and filled as needed.*
6. *A rock buttress to form cells with the borrow pit will be required to ensure access for trucks and excavators can be achieved. This will be formed by leaving in place an upstand of intact rock as the borrow pit excavation is progressed. See Figure 4-14 of the EIAR for the location of the rock buttress. The location of the rock buttress shown on Figure 4-14 of the EIAR for the borrow pit is indicative only and may change subject to local conditions encountered on the Wind Farm Site during construction. The rock buttress will be wide enough (up to 4m) to allow construction traffic access for tipping and grading during the placement of the excavated peat and spoil. The permanent side slopes of the internal rock buttress will be constructed at 45 degrees.*
7. *Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. The contractor excavating the rock will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely.*
8. *The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
9. *The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit.*
10. *An interceptor drain will also be installed around the perimeter of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction, and also when reinstated*

11. *Temporary control of groundwater within the borrow pit will be required. A temporary pump and suitable outfall locations will be required during construction.*
12. *A settlement pond will be constructed at the lower side/outfall location of the borrow pit and is shown on the drainage drawings.*
13. *The acrotelm will be placed with the vegetation part of the sod facing the right way up (where practicable) to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit.*
14. *Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit.*
15. *All the above-mentioned requirements will be implemented by the Contractor during construction.*

2.3.3.5.5 **Borrow Pit Extraction Methods**

As outlined above, the estimated volume requirements to be extracted from the borrow pits for the construction of the Prospective Development is ~74,180m³. The Prospective Development includes for the provision of ~82,000m³ of rock material available on-site. This comprises existing material ready for rock breaking, existing stockpiled quarry rock, and rock to be extracted from the existing onsite borrow pits, i.e. BP1, BP2 and BP3.

The two proposed borrow pit extraction methods (rock breaking and blasting) are detailed below.

Rock Breaking

Weathered or brittle rock can be extracted by means of a hydraulic excavator and a ripper attachment. This is a common extraction methodology where fragmented rock is encountered as it can be carefully excavated in layers. In areas where stronger rock is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Rock breaking equipment comprises a large hydraulic 360-degree excavator with a rock breaker attachment. Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

A large rock breaking excavator progressively breaks out the solid rock from the ground in the borrow pit area. A smaller rock breaker, in the 30-40 tonne size range, then breaks the rocks down to a size that can then be fed into a crusher.

The extracted, broken rock is loaded into a mobile crusher using a wheeled loading shovel and crushed down to the necessary size of graded stone required for the on-site civil works. The same wheeled loader takes the stone from the crusher conveyor stockpile and stockpiles it elsewhere within the borrow pit, away from the immediate area of the crusher, until it is required elsewhere within the Wind Farm Site.

Rock Blasting

Where blasting is used as an extraction method, a mobile drilling rig is used to drill vertical boreholes into the area of rock that is to be blasted. A drilling rig will drill the necessary number of boreholes required for a single blast in approximately 3 to 4 days. The locations, depth and number of boreholes are determined by the blast engineer. This is a specialist role fulfilled by the blasting contractor.

The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Sióchána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast.

A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader outlined above. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon one blast finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Chapter 12: Noise and Vibration of the EIAR. Any blasting will be carried out in accordance with the *Guidance on the Safe Use of Explosives in Quarries* (Safety and Health Commission for the Mining and Other Extractive Industries, 2002)⁴ and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*⁵. Blasting will only be carried out after notifying any potentially sensitive receptors.

Rock Processing

Rock extraction activities will generate various sized rocks, which may include large boulders. As such, large boulders will likely require breaking to enable them to undergo further processing and grading. Rock breaking typically occurs utilising an excavator with a hydraulic breaker. Rock breaking occurs in close proximity to the face to maximise the attenuation offered by the face to transmission of the sound. The rock is collected by either a front-end loader or dumper and transported to the semi-mobile crushing/screening unit or loaded directly to the semi mobile crushing/screening unit which follows the operational face within the void. This will break the rock into pre-selected sizes / grades, generating aggregate stockpiles of the graded rock within the borrow pits. This rock will then be transported to locations within the Wind Farm Site where it is required for construction.

Borrow Pit Decommissioning

Once extraction is complete, the borrow pits will be backfilled with excavated peat and spoil and reseeded or left to vegetate naturally, as outlined in Chapter 4 of the EIAR.

2.3.3.6 Site Drainage System

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

The EIAR (and appended drawings) includes a drainage design for the Prospective Development, 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 4.5 of the EIAR.

2.3.4 Site Entrance Management

Construction and Operational Site Entrance

Due to the nature of the works completed on site to date, access to the Wind Farm Site is via an existing site entrance adjoining the N15 National Primary Road, along the northwest bounds of the Wind Farm Site, and via the local road along the northern bounds of the Wind Farm Site. This entrance along the N15 National Road will be used during both the construction and operational phases of the Prospective Development. Appropriate sightlines will be maintained at the existing Site

⁴https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf

⁵<https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965>

entrance for the safe egress of traffic during the construction phase. On completion of the construction phase, this Site entrance will be reduced in size (by constructing an earthen berm) with the original access arrangement reinstated and will be used as the operational phase entrance. A planning drawing of the reinstated site entrance is provided in Appendix 4-1 of the EIAR.

There is a secondary entrance to the Wind Farm Site off the L-6554 Local Road to the north of the Wind Farm Site, which is proposed as a staff entrance for workers accessing the northern portion of the Wind Farm Site during the construction phase and for maintenance access during the operational phase, as well as vehicles travelling to and from the BMEP Site. The proposed site entrance to the proposed amenity area is located on an existing forestry track, off the L-6554 Local Road, approximately 220 m west of the aforementioned secondary (northern) site entrance to the Wind Farm Site.

2.3.4.2 Watercourse/ Culvert Crossings

The Wind Farm Site is drained by a network of natural watercourses and manmade land drains. These are described in Chapter 4: Description of the Existing Development of the rEIAR.

There are a total of 18 no. crossings located over EPA mapped watercourses within the Wind Farm Site. 14 no. of these crossings were upgraded/constructed as part of the Existing Development and no works will be required at these locations other than the minor upgrades to the existing roads.

There are 2 no. EPA mapped watercourses within the BMEP Site. Please refer to Section 2.3.4.6.2 above for further details in relation to the temporary crossings that will be used at these locations as part of the BMEP proposals.

More significant works are required at the following watercourse crossings within the Wind Farm Site:

- More substantial road upgrades and works are required on the access road to T18 and this section of road is mapped to cross 3 no. EPA mapped watercourses (unnamed tributaries of the Bunadaowen River). Existing culverts already exist at these locations and the Prospective Development includes the upgrades of these culverts. Please note, these crossings are labelled as NR 102 (EC18), NR 14 (EC12) and NR15 (EC19) on the drainage drawings included in Appendix 4-4 of the EIAR.
- As part of the Existing Development, a culvert was installed in a temporary configuration along the access road to T14 (labelled as NR. 48 (PC2) on the drainage drawings included in Appendix 4-4 of the EIAR). As part of the Prospective Development, it is proposed to upgrade this culvert into its final design configuration, via a new box culvert. This will be constructed to the specifications of the Office of Public Work (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'.
- The proposed amenity track is mapped to cross the Bunadaowen River in the north of the Wind Farm Site. This will serve pedestrians only. The proposed crossing will comprise a clear-span steel and timber footbridge. No permanent structures will be located within the watercourse channel and the existing bed and banks will remain undisturbed.
- A culvert extension may also be required on the EPA mapped watercourse located to the east of the temporary construction compound to the south of T10, where it is proposed to extend the hardstand. Note that the watercourse is already culverted beneath the existing hardstand (labelled as NR. 37 (EC8) on the drainage drawings).

Please refer to Section 9.5.2.8 of Chapter 9 of the EIAR for further details on the above watercourse crossings.

2.3.4.2.1 Culvert Crossings

Some culverts may be installed to manage drainage waters from works areas of the Prospective Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge.

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Prospective Development will be suitably sized for the expected peak flows in the relevant drain. Some culverts may be installed to manage drainage waters from works areas of the Prospective Development, 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. In all cases, culverts will be oversized to allow mammals to pass through the culvert. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please refer to Chapter 9: Hydrology and Hydrogeology for further details.

2.3.4.3 Peat and Spoil Management Areas

It is proposed to manage any excess overburden generated through construction activities locally within the Wind Farm Site, in identified peat and spoil management areas, as shown in Figure 4-1 of the EIAR, outlined in Table 4-8 of the EIAR, and detailed in Appendix 4-2 Peat and Spoil Management Plan of the EIAR.

Once the construction of the Prospective Development has been completed, it is proposed that sections of the existing borrow pits, as described in Chapter 4 of the EIAR, as well as a dedicated peat cell at T18, are backfilled with peat, and remaining peat and spoil be used for landscaping within the Wind Farm Site.

Detailed planning drawings of the peat and spoil management areas are provided in Appendix 4-1 of the EIAR. Further details on construction methodologies, including recommendations and best practice guidelines for the placement of peat and spoil in borrow pits, are detailed in Section 4.9.5 of the EIAR, and in the Peat & Spoil Management Plan in Appendix 4-2 of the EIAR.

The total estimated volume of peat and spoil to be managed following excavations during the construction phase of the Prospective Development is ~ 74,180 m³. It is proposed to manage any excess overburden generated through construction activities locally within the Wind Farm Site. The total capacity of the identified spoil management areas within the Wind Farm Site is ~ 150,000m³; thus there is more than enough capacity to manage the total volume of spoil requiring management for the Prospective Development.

The proposed landscaping areas will be covered with a layer of peat/topsoil and/or seeded promote vegetation, to result in roads on site having a minimum running width of approximately 5 metres.

The placement of peat and spoil within the peat and spoil management areas will be undertaken as follows:

1. *All excavated peat and spoil will be transported immediately on excavation to the designated storage areas. No material is to be side cast or stored on the in-situ peat on the downslope side of the access roads/hardstands.*
2. *Further details on the construction and reinstatement of the borrow pit and management areas are given in Section 2.3.3.5 above.*
3. *Some of the peat, in particular the acrotelm (upper layer of the peat), excavated during construction will be used for landscaping purposes around the turbine bases, hardstands and underground cabling corridor.*
4. *Sufficient space has been identified across the Wind Farm Site for the volume of peat and spoil that will be excavated as part of the Prospective Development.*

2.3.4.4 Dedicated Peat Storage Cell (T18)

A designated storage cell is proposed adjacent to T18, within an existing worked area. The location of this is shown on Figure 4-1 of the EIAR, and a plan and cross section is shown in the planning drawings in Appendix 4-1 of the EIAR.

1. *The placement of peat within the peat cell will require the use of long reach excavators.*
2. *The existing perimeter buttress will be inspected prior to filling commencing and widened/strengthened where necessary.*
3. *The surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat/spoil will be carried out as placement of peat within the peat cell progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.*
4. *The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up (where practicable) to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the placement areas.*
5. *Supervision by the Project Geotechnical Engineer is required for the development of the peat cell.*

2.3.4.5 Temporary Construction Compounds

There are two existing temporary construction compounds within the Wind Farm Site. One of the compounds is located in the vicinity of the existing 110kV on-site substation. This compound is proposed for continued use during the construction phase of the Prospective Development.

The second temporary construction compound is located along the access track just south of T10. It is proposed that this compound will continue to be used and will be extended by approximately 800m² as part of the Prospective Development works, to accommodate the turbine manufacturer's welfare requirements. During the construction of the Prospective Development, this compound will comprise 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 on site for hygiene purposes, by way of a temporary storage tank. The temporary construction compound will include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor. The layout of the temporary construction compounds are shown in Figure 4-17 and Figure 4-18 of the EIAR.

The extension to the temporary construction compound will be constructed as follows:

1. *The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;*
2. *A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers;*
3. *Areas within the compound will be constructed as site roads and used as vehicle hardstanding's during deliveries and for parking;*
4. *A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc;*
5. *A waste storage area will be provided within the compound;*
6. *The compound will be fenced and secured with locked gates if necessary; and,*
7. *Upon completion of the construction phase of the Prospective Development, the temporary construction compound will be decommissioned and allowed to vegetate naturally.*

2.3.4.6 Biodiversity Management and Enhancement Measures

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Prospective Development and is included as Appendix 6-4 of the EIAR. The BMEP contains proposed measures to ensure that there is no net habitat loss for hen harrier due to the Prospective Development. The comprehensive BMEP is first and foremost a deforestation plan, as commercial forestry is a key threat/pressure of *High Importance* acting on hen harrier nationally. A description of the road construction works within the BMEP Site is provided in Section 2.3.3.4.2 above.

2.3.4.6.1 Enhancement Measures

Two different types of enhancement areas within the BMEP Site have been selected for habitat restoration measures as part of the Prospective Development.

Peatland Habitat Restoration

As part of the BMEP, it is proposed to restore 6.2 ha of peat habitat. The location of the proposed peatland enhancement area was chosen specifically because it supports poorly grown forestry on deep peat habitat with blanket bog vegetation persisting over much of the ground layer. It has a flat topography and is accessible from existing roads to the south of the parcel. There is an elevation difference of 4m (174m elevation south-west to 170m elevation north-east). The topography on site is therefore suitably flat for surface smoothing and furrow blocking or the effective installation of peat dams where required, which is the preferred drain blocking solution in line with NatureScot best practice guidance.

The proposed enhancement of 6.2ha of peatland habitat through the measures described in the BMEP in Appendix 6-4 of the EIAR will restore approximately twice as much peatland habitat than was lost or damaged as a result of the Existing Development.

Hen Harrier Habitat Restoration

The main objective of the hen harrier habitat enhancement measures is to create, maintain and improve habitats for the benefit of foraging hen harrier. Hen harrier habitat enhancement will be undertaken across approximately 108.41 hectares of currently conifer plantation on peatland. The target condition for this habitat will be open heathland, with pockets of willow and birch scrub throughout, covering a maximum of 30% of the enhancement area in total.

Parcel 1 of the BMEP Site is 70.5ha of commercial forestry that was planted in 1995 and is all unenclosed ground. The majority of tree species are Sitka Spruce with some Lodgepole Pine and Japanese Larch. There is one ridelane through the plantation, as well as a stream located along the eastern boundary and there is an internal stream crossing the plantation. The canopy of the trees is closed. Sections within Parcel 1 include firebreaks with species compositions characteristic of upland blanket bog (PB2).

Parcel 2 of the BMEP Site is a 45.7ha parcel of conifer commercial forestry. Parcel 2 includes forestry, which did not take well to the wet, peaty soils, resulting in patchy mosaics of conifer plantations (WD4) and areas in which the species composition is characteristic of upland blanket bogs (PB2) and wet heath (HH3). There is one access road which has become largely overgrown.

The BMEP Site is currently forested and of low ecological value to foraging hen harrier. Forestry is a net negative for hen harrier, as highlighted in Article 12 reporting. Although commercial forestry can provide suitable hunting habitat for hen harrier in the first ten years of tree growth, before a thicket forms, the trees are typically harvested every 40-45 years, therefore the parcels are likely to be unsuitable for up to 35 years (or 75% of the lifetime).

Permanent felling to waste will be undertaken as set out in the BMEP in Appendix 6-4 of the EIAR. Timber and brash will be gathered and removed from the parcel in line with best practice. Windrow is not considered suitable for the blanket bog enhancement area, as best practice guidance recommends that brash recovery is particularly important in water quality sensitive catchments. Brash mats may be left in place to facilitate access for enhancement activities.

A full description of the enhancement measures and methodologies (including monitoring measures) to be employed at the BMEP Site is provided in Appendix 6-4 of the EIAR.

2.3.4.6.2 **Temporary Watercourse Crossings within the BMEP Site**

There are 2 no. EPA mapped watercourses within the BMEP Site. In Parcel 1, one stream runs from west to east and bisects the parcel. This watercourse will need to be crossed to facilitate the proposed works. In Parcel 2, a watercourse runs in a south westerly direction in the southern section of the western parcel for approximately 250 m. The crossing of these watercourses will be avoided wherever possible. However, where temporary crossings cannot be avoided, the following measures will be applied:

- No instream works will be undertaken.
- No watercourse will be interfered with and temporary bridge construction will ensure that water flow will not be impeded and conveyance of increased water flow resulting from above normal rainfall.
- Movement of fish will not be impeded.
- Crossings points will be constructed at right angles to the water flow.
- On sloping ground, temporary bridges to be constructed in a 'Hump Back' fashion. This will reduce the risk of silt flowing down the wheel ruts and directly entering the stream/drain being crossed.
- Any run-off will be diverted onto a buffer strip at a suitable point well above the stream.
- The machine track leading to the bridge will be very well brashed and ruts that can act as water channels down to the stream will not be allowed to develop
- Bridging logs will be placed from top of bank to top of bank to ensure that the natural stream banks are left intact.
- The temporary watercourse crossings will be removed following the completion of the works.

2.3.4.6.3 **Summary**

The BMEP sets out the measures to manage and enhance the biodiversity in the locality of the Prospective Development. Specifically, proposed peatland restoration will result in enhancement of peatland habitat on the BMEP Site, while also offsetting the losses of degraded wet heath to facilitate the wind farm and result in habitat of higher suitability for hen harrier, alongside the establishment of areas of patchy willow-dominated scrub.

The BMEP has set out measures to be implemented during establishment and management phases to ensure that the targets of this BMEP are successful. It also provides for monitoring of the target habitats by an ecologist to ensure the success of the measures outlined in the BMEP.

Full details of the enhancement measures outlined above are outlined in Appendix 6-4: BMEP of the EIAR.

2.3.4.7 Tree Felling and Vegetation Removal

2.3.4.8 Tree Felling/ Replanting

Much of the felling works to accommodate the Meenbog Wind Farm was completed during the construction of the Existing Development, however additional felling of commercial forestry (conifer plantation (WD4)) is required within the Wind Farm Site as part of the Prospective Development. Furthermore, tree felling is also required within the BMEP Site to facilitate the conversion of these areas to peatland and scrub habitats.

Both permanent and temporary felling is proposed as part of the Prospective Development. Within the Wind Farm Site, ~8.6ha of permanent felling and ~3.5ha of temporary felling is required, whilst the felling required within the BMEP Site totals ~109.4ha of permanent felling (note, this comprises the ~108.4 ha to be felled for hen harrier habitat enhancement, and additional felling to facilitate the access to the BMEP Site). Therefore, there will be the permanent removal of ~118 ha of commercial forestry at the Site (~121.5 ha when temporary felling is included). Figure 4-19 of the EIAR shows the extent of the commercial forestry to be felled as part of the Wind Farm Site. The felling required for the BMEP Site is illustrated in the planning drawings in Appendix 4-1 of the EIAR.

The forestry felling activities required as part of the Prospective Development 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 Subject Development 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 Subject Development.

2.3.4.8.1 Tree Replanting

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 replanting 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 Prospective Development.

The identified ~8.6 hectares (ha) of conifer plantation that will be permanently felled for the Prospective Development within the Wind Farm Site 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 Prospective Development 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 Prospective Development may occur on any lands, within the State benefitting from Forest Service Technical Approval⁶ for afforestation, should the Subject Development receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Appropriate Assessment purposes).

In addition to the ~8.6 ha of permanent felling, ~3.5 ha of temporary felling is also required within the Wind Farm Site to facilitate the Prospective Development.

⁶ 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 applicant commits to replanting the ~8.6 ha of conifer forestry outside the hydrological catchment within which the Prospective Development is located. On this basis, it is concluded that there will be no cumulative effects associated with the replanting of ~8.6 ha of conifer forestry. Therefore, the conifer forestry replanting is not considered further in the impact assessment chapters of the EIAR. In addition, the applicant commits to not commencing the Prospective Development 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.

As part of the Prospective Development, ~9.1 ha of the combined ~3.5 ha of temporary felled coniferous forestry (outlined above) and the 6.76 temporary felling that has already been undertaken as part of the Existing Development (as outlined in Section 4.4.1.9 of the rEIAR) will be replanted within the Wind Farm Site. The remaining ~1.2 ha of temporary felling will be replanted outside the hydrological catchment within which the Prospective Development is located, as these areas are no longer suitable for replanting within the Wind Farm Site due to existing and proposed infrastructure. The proposed replanting of temporary felled areas will occur within the suitable areas shown on Figure 4-19 of the EIAR.

A derogation will be sought in relation to the felling requirements at the BMEP Site, and if obtained, no replanting will be required for the felling that is undertaken to facilitate the BMEP Site. In the event that this derogation is not obtained, the replanting obligation for the felling undertaken at the BMEP Site will be replanted on a hectare for hectare basis outside the hydrological catchment within which the Prospective Development is located.

2.3.4.9 **Underground Electrical (33kV) and Communication Cabling**

As outlined in Chapter 4 of the EIAR, a large portion of the onsite underground cabling ducting work has been completed to date, with some sections of existing cable ducting to be replaced, and several sections of new cable ducting required to connect the wind turbines to the existing onsite substation.

The transformer in each turbine will be connected to the onsite 110kV substation through a network of buried electrical cables. The ground is trenched typically using a mechanical excavator. The top layer of soil is removed and saved so that it is replaced on completion. The cables are bedded with suitable material unless the ground conditions are such that no bedding is required. The cables will be laid at a depth that meets relevant national and international requirements and will generally be approximately 1.2m below ground level; a suitable marking tape is installed between the cables and the surface. Please 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 of the outstanding cabling and ducting upgrade works, the ground will be reinstated. The route of the cable ducts will follow the access track to each turbine location and are shown on the site layout drawings included as Appendix 4-1 of the EIAR. The cabling may be located on either side of the road and/or within the road footprint.

2.3.4.9.1 **Trenching and Ducting**

The proposed cable will be installed in a series of ducts in an excavated trench. Where new sections of duct are required, once the required depth and width is achieved, the trench base will be re-graded and smoothed. A layer of bedding material will be placed and compacted to the required specification on the trench floor prior to laying the ducts in trefoil formation.

The ducting surrounds will be carefully backfilled and compacted in accordance with the required specification. Cable protection strips will be placed on compacted material directly above the ducting. A secure cap will be placed at the end of each duct to prevent the ingress of dirt or water.

Ground water and surface water accumulating in the base of trenches where ducting is being replaced will not be pumped directly to roadside drains or watercourses unless it is clean and free from solids.

Contaminated water will be either treated onsite prior to discharge or tankered offsite to a suitably licensed disposal facility.

Where ducts are within the internal site road network, surfacing will be reinstated for use during the operational phase. In areas where ducts are laid in unsurfaced/grass sections, trenches will be backfilled with suitable excavated material to ground level leaving at least 100 mm topsoil or match existing level at the top to allow for seeding.

Ducting will be cleaned and tested in accordance with the specification by pulling through a brush and mandrel. A draw rope will be installed in each duct in preparation for cable installation at a later date.

Where these ducts are currently exposed within the Wind Farm Site adjacent to existing access roads, stone will be backfilled over these ducts followed by soil and reseeding.

Please refer to the planning drawings in Appendix 4-1 of the EIAR for cross-sectional and longitudinal drawings showing the typical cable trench arrangement at culvert crossings.

2.3.4.9.2 **Underground Electrical (33kV) and Communication Cabling in Floated Roads**

Some sections of the 33kV cabling will be installed and/or replaced in floating roads. Upgrading of the floating access roads will be completed prior to installation of the 33 kV electrical cabling. Prior to cable installation, the route will be inspected to identify drainage infrastructure and culvert crossings. The ducting arrangement will be designed to maintain appropriate separation distances from drainage infrastructure, with lean mix concrete protection provided where required.

Cable trenches will be excavated within the floating roads to the top of the existing combi-grid base layer. Cable ducts, including power, communications and earthing infrastructure, will be installed within the trench on a suitable granular bedding layer. Required separation distances between ducts will be maintained.

Following duct installation, the trench will be backfilled with suitable granular material and compacted in layers. The floating road structure, including the geogrid reinforcement, will be reinstated to maintain the integrity and performance of the road.

2.3.5 **Wind Farm Site Amenity Areas**

2.3.5.1 **Timber Boardwalk**

As part of the proposed amenity proposal, a timber boardwalk will be constructed between T6 and Carrickaduff Lough, with a viewing platform proposed in the vicinity of Carrickaduff Lough. The boardwalk will be approximately 190m long and 3m wide, with a viewing platform of approximately 15m by 6m. The construction methodology for the boardwalk will also apply to the viewing platform. Boardwalks provide a low-impact form of access infrastructure, enabling pedestrian movement across sensitive habitats while maintaining existing drainage patterns and minimising ground disturbance when compared to conventional path construction methods.

The construction methodology will be as follows:

- The boardwalk alignment will be set out in accordance with approved drawings and ecological constraints, ensuring avoidance of sensitive habitats and minimisation of the construction footprint.
- Low-ground-pressure plant shall be used, and where necessary bog mats/track systems shall be deployed.
- No excavation, removal, or replacement of peat material will be undertaken.

- A timber pile system will be adopted to avoid disturbance to underlying peat soils, in accordance with best practice for peatland environments.
- Piles will be installed using low-impact methods, including hydraulic-driven timber piles to competent bearing stratum or refusal as required.
- Pile caps/head beams and longitudinal members will be installed using corrosion-resistant fixings suitable for wet environments.
- Timber joists and decking will be installed above the substructure, maintaining existing hydrological flow, with drainage gaps provided between boards.
- All timber will be pressure-treated or otherwise suitable for external exposure and ground-contact conditions.
- The construction of this timber boardwalk will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works.

2.3.5.2 Pedestrian Gravel Track

The proposed gravel track forms part of the amenity access network and will provide a permeable, low-impact pedestrian route. The gravel track will be approximately 165m long and 3m wide.

The construction methodology will be as follows:

- The path alignment will be set out in accordance with approved drawings and ecological constraints, avoiding sensitive habitats where practicable.
- Topsoil and vegetation will be carefully stripped and stored separately for reuse in reinstatement where appropriate.
- A geotextile membrane will be installed where required to separate subgrade soils, followed by a compacted granular fill layer forming the structural base and a gravel wearing course to provide the finished surface.



Plate 2-1 Typical Single Cable Trench View



Plate 2-2 Typical Trefoil Cable Trench View

3. ENVIRONMENTAL MANAGEMENT

3.1 Introduction

This CEMP includes all best practice measures required to construct the Prospective Development. 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 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:

- 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 (EPA) (2022): Guidelines on the information to be contained in Environmental Impact Assessment Reports; (hereafter referred to as '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 DoEHLG 2006 Guidelines) and the Draft Revised Wind Energy Development Guidelines (Draft DoHLGH 2019 Guidelines);
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);
- PPG5 – Works or Maintenance in or Near Water Courses (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) Guidance on ‘Control of Water Pollution from Linear Construction Projects’ (CIRIA Report No. C648, 2006);
- Wind Farms and Groundwater Impacts: A guide to EIA and Planning considerations (DoE/NIEA, April 2015);
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001;
- Land Types for Afforestation (Forest Service, 2016b);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b); and,
- Forests and Water, Achieving Objectives under Ireland’s River Basin Management Plan 2018-2021 (DAFM, 2018).

3.2.3 Site Drainage

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 Prospective Development. The drainage design for the Prospective Development has been prepared by Hydro Environmental Services Ltd. (HES) and is included in Appendix 4-4 of the EIAR. The drainage design has been prepared based on experience of the project team of other wind farm sites, and the number of best practice guidance documents referred to in the Bibliography section of the EIAR. Please refer to the rEIAR for further detail on existing site drainage features.

The protection of groundwater and surface water within and surrounding the Wind Farm Site, and downstream catchments that they feed has been of utmost importance in considering the most appropriate drainage proposals for the Wind Farm Site.

The Wind Farm Site drainage design has therefore been proposed specifically and ensures minimal impact with regards the existing flow regime across the Site, in particular having no negative impact on the water quality of the Site and consequently no impact on downstream catchments and ecological ecosystems. No routes of any natural drainage features will be altered as part of the Prospective Development and turbine locations and associated new roadways were originally selected to avoid natural watercourses, and existing roads are to be used wherever possible. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at a minimum of 50m and 100m distance from streams and lakes respectively. Buffer zones around the existing natural drainage features have constrained the layout of the Prospective Development.

3.2.3.1 Drainage Design Principles

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

- Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge/recharge to ground.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas.
- There is no direct hydraulic connectivity from proposed construction areas to natural watercourses or drains connecting to downstream watercourses.
- Maintain the existing hydrology/hydrogeology of the Site.
- Re-routing existing local drainage pathways as required.
- Daily inspection and recording of surface water management system by on-site 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.

Turbine locations and associated roadways were originally selected to avoid natural watercourses. Existing roads are to be used wherever possible as part of the Prospective Development. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows or into existing field drains.

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 natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waters from works areas within the site that might carry silt or sediment, to allow attenuation and settlement prior to controlled diffuse release.

The drainage design is intended to maximise erosion control, which is more effective than having to control sediment during high rainfall. Such a system also requires less maintenance. The area of exposed ground will be minimised. The drainage measures will prevent runoff from entering the works areas of the site from adjacent ground, to minimise the volume of sediment-laden water that has to be managed. Run-off from any construction area will be isolated from natural clean run-off.

The drainage measures associated with the Prospective Development are proportionate to the scale and nature of the proposed works. Much of the existing wind farm drainage infrastructure remains effective in protecting downstream water quality and will continue to perform this function during the construction of the Prospective Development. More significant drainage measures are proposed in locations where the more substantial works are proposed (i.e. BP2, BP3, access track to T18, T18, access track to T2, T2 and T11).

Chapter 9 of the rEIAR for the Existing Development demonstrates that the construction activities did not result in any significant effects on surface water (quality and flows) and groundwater (quality and quantity), with the exception of the November 2020 Peat Slide which resulted in a at worst, short-term significant effect. The drainage measures proposed for the Prospective Development are comparable to those successfully employed previously and are proportionate to the scale of the proposed works. Therefore, the proposed drainage measures are considered effective in protecting the hydrological and hydrogeological environment.

A schematic line drawing of the proposed drainage design is presented in Figure 4-21 of the EIAR.

The detailed drainage design for the Prospective Development will be overseen by Project Hydrologist during construction to incorporate these Site drainage principles and carry forward into the construction phase of the Prospective Development.

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

3.2.3.2 Site Drainage Design and Management

The drainage measures associated with the Prospective Development are proportionate to the works that are intended in each area. This is because much of the existing wind farm drainage network is sufficient to protect downstream water quality. More significant drainage infrastructure is proposed in areas where the main additional works are proposed (i.e. BP2, BP3, access track to T18, T18, access track to T2, T2 and T11). The Prospective Development drainage replicates what works well from the Existing Development drainage layout i.e. use of interceptor/collector drains, silt fencing, silt traps, settlement ponds and routing treated drainage downstream via the existing forestry drainage network.

- The Prospective Development drainage strategy replicates the proven approach which was successfully implemented for the Existing Development. Chapter 9 of the rEIAR for the Existing Development demonstrates that the construction activities did not result in any significant effects on surface water (quality and flows) and groundwater (quality and quantity), with the exception of the November 2020 Peat Slide which resulted in a at worst, short-term significant effect. The drainage measures proposed for the Prospective Development are comparable to those successfully employed previously and are proportionate to the scale of the proposed works.
- 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 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.

The key mitigation measure to be implemented 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 Prospective Development is located outside of the delineated 50m natural watercourse (river and stream) buffer zones. Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the hydrological buffer zones. The silt fences will be installed as single, double or triple silt fences depending on the space available and the anticipated loading. Further details on silt fences are included in the CEMP (Appendix 4-3 of the EIAR).

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.

All of the Prospective Development 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 4.5 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.

It should be noted that for the Prospective Development, an extensive network of forestry and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Prospective Development drainage system. The integration of the existing forestry drainage network and the Prospective Development drainage 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 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; and,
- The treated runoff will be discharged into the existing downstream forestry drain network or re-distributed over natural ground

Pre-commencement Temporary Drainage Works

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.

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 Prospective Development 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)⁷. Settlement ponds at the borrow pit are designed to allow 24hr retention and settlement ponds along access roads and at turbine hardstands will have 11hr retention as there is additional in-line drainage controls proposed along access tracks and at hardstands.

The supporting design calculations for all settlement ponds are included on Drawing D501 included in Appendix 4-4.

Pre-emptive Site Drainage Management

The works programme for the entire construction stage of the Prospective Development 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 to 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;

⁷ Environmental Protection Agency (2006): *Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*.

- 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.

Timing of Site Construction Works:

Construction of the site drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Monitoring:

An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling.

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. Checks will be carried out on a daily basis.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards (EQSs) will be undertaken for each primary watercourse, and specifically following heavy rainfall events (as per the CEMP included in Appendix 4-3 of the EIAR).

Allowance for Climate Change

Climate change rainfall projections are typically for a mid-century (2050) timeline. The projected effects of climate change on rainfall are therefore modelled towards the end of the life cycle of the Prospective Development, as the turbines have a life span of 35 years. It is likely that the long-term effects of climate change on rainfall patterns will not be observed during the lifetime of the Meenbog Wind Farm. As outlined in the above sections we have designed settlement ponds for a 1 in 10-year return flow. This approach is conservative given that the Prospective Development will likely be built over a much shorter period (12-18 months), and therefore this in-built redundancy in the drainage design more than accounts for any potential short term climate change rainfall effects.

However, the settlement ponds are designed for 1 in 10 years flows with built in redundancy (+20%) to account for climate change effects on rainfall.

3.2.3.3 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 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.

3.2.3.4 Pre-emptive Site Drainage Management

The works programme for the entire construction stage of the Prospective Development 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 (see Section 3.2.4.8).

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.

3.2.3.5 Reactive Site Drainage Management

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.

3.2.3.6 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 Chapter 4 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.

3.2.3.7 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 Peat/subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Prospective Development, 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.

Where maintenance works along the Grid Connection route are required during the operational phase, and result in excavated material, excess excavated material will be transported to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Section 4.5 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.

3.2.3.8 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.

The following forecasting systems are available and at least one of the following 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 informative 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.

The Construction Site Manager 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 Site Manager of rainfall trigger levels. Any recorded rainfall data should be available on site at all times for review by the ECoW, Project Hydrologist or any regulatory authorities. The appointed contractor will be required to outline their proposed means of recording rainfall on site to the satisfaction of the ECoW and the Project Hydrologist prior to commencement of works.

The following measures will be implemented:

- Following periods of heavy intense rainfall, such as 10mm/hr, >25mm in a 24 hour period, or >50% of monthly average in a 7 day period and in following 24 hours, no groundworks may take place and any ongoing works should be restricted to hardstanding areas. (b)
- When periods of heavy intense rainfall are predicted then works shall be ceased in advance and any construction works in critical areas with respect to stability are secured in advance.
- Following periods of heavy intense rainfall the site shall be inspected prior to resumption of construction works by a competent person to ensure that all drainage is working, and critical areas with respect to stability are stable with no signs of ground movement.

3.2.4 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 when not in use.

All refuelling will be carried out outside designated watercourse buffer zones. Mobile measures such as drip trays and fuel absorbent mats will be 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 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 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required;
- Fuels stored on the Wind Farm Site will be minimised;
- Any diesel or fuel oils stored at the temporary construction compound will be banded. 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.

3.2.5 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.

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching.

Before leaving the Site, washing of the delivery truck will be minimised and restricted to designated wash out areas. There is an existing wash-out area on site, located southeast of T10 along the site access road. This wash-out area is proposed for continued use during the construction of the Prospective Development. Wash out will be restricted to the concrete lorry's chute only. 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. A temporary lined impermeable containment area exists on site for use during construction, and was built using straw bales and lined with an impermeable membrane. Two

examples are shown below in Plate 3-1. Concrete lorries will be washed out fully (i.e. beyond just the chute) at the off-site batching plant, where facilities are already in place.

During the construction phase, concrete wash-out areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste by an appropriately authorised waste collector for disposal at an authorised waste facility.

Alternatively, a Siltbuster-type concrete wash unit or equivalent⁸ may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site at an appropriate licensed waste facility.

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

- Concrete trucks will not be washed out on-site but will be directed back to their batching plant for washout.
- Remaining site roads will initially be constructed with a subgrade and compacted with the use of a roller to allow concrete delivery trucks access all areas where the concrete will be needed. The final wearing course for the roads will not be provided until all turbine foundations have been poured. No concrete will be transported around the Wind Farm Site in open trailers or dumpers so as to avoid spillage while in transport. All concrete used in the construction of turbine foundations will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed.
- The arrangements for concrete deliveries to the Wind Farm Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures.
- Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Wind Farm Site.



Plate 3-1 Typical concrete wash out areas

⁸ (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/)

3.2.6 Tree Felling Drainage Measures

As discussed in Section 2.3.3.11 above, the Prospective Development will allow for the construction of the proposed turbines, access roads, underground cabling on-site, 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 4-5.

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.

Tree felling operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed within EIAR Chapter 9 Water, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment.

- Forestry Standards Manual (Forest Service, 2015)
- Forest Protection Guidelines (Forest Service, 2002)
- Forest Operations and Water Protection Guidelines (Coillte, 2013)
- Forestry and Water Quality Guidelines (Forest Service, 2000b)
- Forestry and the Landscape Guidelines (Forest Service, 2000c)
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018)
- Coillte Planting Guideline SOP
- Code of Best Forest Practice (Forest Service, 2000)

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.
- 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.

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 3-1.

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

- Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment;
- Avoid soil disturbance and compaction within close proximity to surface watercourses;
- Avoid the entry of suspended sediment from works into watercourses; and,
- Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

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 Cultural Heritage of the EIAR for the construction phase of the Prospective Development.

There are no UNESCO World Heritage Sites or National Monuments located within or along the footprint of the Prospective Development.

No previously unrecorded archaeological monuments, stray finds or structures were noted within the Wind Farm Site during the previous walk-over surveys, the site inspection carried out for this assessment in 2025 or during archaeological monitoring of ground works for the Existing Development.

One potential Cultural Heritage feature was noted within Parcel 2 of the BMEP Site during the cartographic review carried out as part of this assessment. The potential feature is indicated on the third edition OS map and named 'Labincuggy'. No evidence for a feature at this location was apparent on the available aerial photography and dense coniferous forestry is located in its immediate vicinity. Clear-felling of that forestry is proposed as part of the BMEP in addition to the construction of an access road to facilitate provision of harvesting machinery. The proposed access road which is located c. 75m to the south of the potential feature will not involve ground disturbance as a 'Build on Top' methodology will be utilised. In this regard no potential direct effects to the feature as a result of same is identified, however, some mitigation is proposed as a precautionary measure.

Both Parcel 1 and Parcel 2 of the BMEP Site are currently covered in dense coniferous forestry. the presence of such forestry cover may obscure the presence of previously unknown Cultural Heritage assets. In this regard and in the interest of ensuring the continued preservation of any items of Cultural Heritage merit which may be located within the proposed BMEP Site some mitigation is proposed as a precautionary measure.

Proposed Mitigation Measures

- A buffer zone of 10m will be established around the potential Cultural Heritage feature within the Western block prior to the commencement of clear-felling in this area. The buffer will comprise durable post-and-wire fencing with 'Keep Out' signage.
- A walk-over survey of the BMEP Site (both Eastern and Western blocks) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking.
- The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.

Ground works for the proposed BMEP Site are considered to be minimal in terms of depth as they will largely comprise the flipping of tree stumps and surface smoothing. The former comprises the flipping of the tree stumps into the adjacent furrow using a mechanical excavator equipped with a toothed bucket. Ground disturbance associated with this work is localised to the generally shallow root system of the tree and will not require deep excavation. Surface smoothing is the process where the ridge and furrows of the forestry drains are levelled or smoothed out using a combination of damping down with the excavator bucket, flipping or mulching stumps, and cross tracking. Surface smoothing also does not involve any deep excavation and may be regarded as minimally invasive given that the key principles of such work are 'enough and no more' and aim to minimise compaction and disturbance. In this regard, no potential direct impacts to sub-surface archaeology are identified, however, mitigation measures are proposed on a precautionary basis.

Proposed Mitigation Measures

- Archaeological monitoring under licence from the NMS of any further peat removal required as part of the construction stage of the Prospective Development will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.
- Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.
- A walk-over survey of the BMEP Site (both Parcel 1 and Parcel 2) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking.
- The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.
- A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented.

3.4 Traffic Management

This section of the CEMP provides an outline of the traffic management proposals for the construction phase of the Prospective Development. 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 Wind Farm Site

Killybegs Harbour has been selected and assessed to facilitate turbine delivery to the Wind Farm Site. It is proposed that large wind turbine components will be delivered to the Wind Farm Site, from Killybegs Port, northeast on the R263 Regional Road, before turning right on to the N56 National Road, continuing east, then turning left onto the N15 National Road, and continuing northeast towards the entrance to the Wind Farm Site.

General construction deliveries and staff will access the Wind Farm Site via the existing site entrance adjoining the N15 National Road, along the northwest bounds of the Wind Farm Site, as described in Section 4.6.1 of the EIAR. 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 Grid Connection Route

The existing onsite 110kV substation is already connected via underground cabling within the N15, to the 110kV Clogher Substation. As such, the works required along the Grid Connection Route are occasional maintenance that may be required through the construction and operational phases of the Prospective Development.

3.4.2 Traffic Mitigation Measures During the Construction Stage

The successful completion of the Prospective Development will require significant coordination and planning. A comprehensive set of mitigation measures will be put in place before and during the construction stage of the Prospective Development in order to minimise the effects of the additional traffic generated by the Prospective Development. 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 Donegal County Council in advance of deliveries of turbine components to the Wind Farm 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 Wind Farm Site.

- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. the delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number 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 Prospective Development 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.
- **Liaison with the relevant local authority** - Liaison with Donegal 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 minor alterations to road network at critical junctions – at locations highlighted in Section 15.1.8.
- **Agreement of delivery routes** – These routes will be agreed with Donegal 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.
- **Traffic management on L6554** – Temporary traffic management measures including signage and flagmen on short section of L6554 during tree felling associated with the BMEP.
- **Travel plan for construction workers** – While the assessment in Section 15.1 of the EIAR 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 4-3 of the EIAR.
- **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 Wind Farm Site, along haul roads and along the public road corridor, and along internal access tracks to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Wind Farm 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 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 Prospective Development will be covered by tarpaulin where necessary.
- If necessary, excavated material will be dampened prior to transport to the peat and spoil management areas.
- 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 Prospective Development to reduce the amount of emissions associated with vehicle movement.
- Groundworks (i.e., works with potential to create dust) associated with proposed turbines will be fully supervised by an ECoW.
- The ECoW will regularly monitor adjacent Annex I habitat for signs of degradation.
- 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 Prospective Development.

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 contract documents will specify that the Contractor undertaking 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. To ameliorate any potential noise impacts that may present during the construction phase, a schedule of noise control measures has been formulated in accordance with best practice guidance. The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria:

- 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;
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- Selection of plant with low inherent potential for generation of noise and/ or vibration where practical;
- Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and;
- 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.

Where rock breaking is employed in relation to the proposed borrow pit locations or other locations across the Site, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities:

- Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency.
- Ensure all leaks in air lines are sealed.
- Use a dampened bit to eliminate ringing.

Air overpressure from a blast is difficult to control, however, because of its variability much can be done to reduce the effect. A reduction in the amount of primer cord used, together with the adequate burial of any that is above the ground, can give dramatic reduction to air overpressure intensities especially in the audible frequency range. Most complaints are likely to be received from an area downwind of the blast site, and therefore, if air blast complaints are a continual problem, it would be advisable to postpone blasting during unfavourable weather conditions if possible. As air blast intensity is a function of total charge weight, then a reduction in the total amount of explosives used can also reduce the air overpressure value.

Further guidance will be obtained from the recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 in relation to blasting operations.

The methods used to minimise impacts will consist of the following:

- Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs).
- The firing of blasts at similar times to reduce the ‘startle’ effect.
- On-going circulars informing people of the progress of the works.
- The implementation of an onsite documented complaints procedure.
- The use of independent monitoring for verification of results.
- Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.

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.

An assessment of the operation noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section 12.6.2 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 of the locations.

3.6.1 Operational Noise

In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Prospective Development, 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. Due consideration should be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document entitled ‘*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*’ (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the Salford University document ‘*Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011*’. Please see Section 12.7 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 alien species (IAS) (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. Only one such species was identified within the Site during these surveys, namely Rhododendron (*Rhododendron ponticum*).

Rhododendron was found occasionally within the Site, but there were no large patches, just single bushes or very small clumps and none were recorded within or adjacent to the footprint of the Prospective Development with the exception of the BMEP Site.

Notwithstanding the above, a detailed IAS survey will be undertaken prior to the re-commencement of construction works at the Site to update the surveys previously undertaken. This will identify any invasive alien species listed on the First Schedule of the S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024. The locations of any such species will be recorded and their locations mapped. Should any be located within or adjacent to the footprint of the Prospective Development, the measures set out in the following sections will be undertaken.

Where works will be required within the buffer zone (likely in the Biodiversity Management and Enhancement Site). The stand will be identified by the ECoW and shown to the contractor. The plant will be excavated (including roots) with the dead material stacked on an impermeable surface such as a radon barrier or pallette to dry out. The area will be marked and monitored for any regrowth annually

for the first five years of operation and periodically thereafter (with periods not exceeding five years). Any regrowth will be removed as above.

Machinery will be thoroughly cleaned down with stiff brushes under the supervision of the ECoW before leaving the contaminated area to avoid the potential to spread the plant throughout the Site. It is not intended to remove any rhododendron from the Site.

An Invasive Species Management Plan is included for the Prospective Development within Appendix 6-3 of the EIAR. The Invasive Species Management Plan sets out best practice control methods as summarised in the following sections.

Rhododendron regrows vigorously when cut. As a result, some method of stump killing or removal is always necessary. Any untreated cut stump will regrow and in most cases flower within 3-4 years: Prior to the commencement of any works, the following site setup procedures will be carried out:

- A pre-commencement survey for Invasive Alien Species will be undertaken by a fully qualified ecologist to determine the locations and extent of the species within the Site and to determine whether there have been any changes in the extent of the infestation since the undertaking of the most recent surveys in 2025.
- The locations and extent of any IAS within the Site will be clearly marked out using hazard tape to ensure they are not disturbed. A 10m buffer zone (Higgins, G.T. 2008) surrounding each stand will also be applied using temporary fencing, to avoid disturbance of potentially contaminated soils.
- All staff and contractors working on the Site will be briefed on the findings of the pre commencement IAS surveys and will be provided with training in the identification of the invasive species likely to be recorded on the Site and the measures to be taken to avoid their spread (e.g. avoid where possible and retain buffer zone).

A detailed Invasive Species Management Plan for the Prospective Development is provided in Appendix 6-3 of the EIAR.

3.8

Management of Bird Species/Habitats

As detailed in Chapter 7 of the EIAR, the majority of the below measures are proposed as industry best practice rather than to mitigate any identified significant effect, and will be updated as required to address any conditions of a permission or findings of any pre-construction survey results. Measures specific to birds are detailed below:

- Construction works will not take place in the vicinity of the most recent hen harrier nest site until the forestry canopy closes at this location, to ensure no short-term loss of nesting habitat.
- Works will commence outside the bird nesting season (1st of March to 31st of August inclusive).
- A pre-construction bird survey at the Wind Farm Site will be organised to ensure that any sensitive roost or nest sites in the works area are identified and disturbance to these are avoided. This will include surveys targeted towards hen harrier and long-eared owl (further details are provided in Appendix 7-7 of the EIAR). There will be a particular emphasis on nesting hen harrier, especially in proximity to the known previous nest sites.
- Construction phase surveys will be conducted, including a dedicated breeding hen harrier survey (further details are provided in Appendix 7-7 of the EIAR). 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; NatureScot, 2022; or other relevant literature). No works shall be permitted within the buffer until it can be demonstrated that the birds are no longer dependent on the roost/nest. The most

recent NatureScot guidance (NatureScot, 2022) suggests a disturbance distance of 300-750m for hen harrier during the breeding season, while the Forestry Commission of Scotland (2006) recommends 500-1000m. The appropriate disturbance buffer will depend on the scale and duration of the works occurring at the time, as well as the connectedness/sightlines to the nest site, and the time of year. If breeding hen harrier are identified, a suitably qualified Ecological Clerk of Works (ECoW) will be appointed to conduct an assessment to determine the construction restrictions required to avoid disturbance to the pair or their young, or damage to habitat depended on by the pair of their young. Taking a precautionary approach, the assessment will begin with a potential disturbance buffer of 500-1000m around the breeding area, depending on the particulars of the nest location, to be determined by the ECoW. The ECoW will monitor the response of the hen harrier and adapt the disturbance buffer if necessary.

- The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.
- During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. 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.
- Silt fences will be installed as an additional water protection measure around existing watercourses.

3.8.1 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.

3.8.2 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.

3.9 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 Prospective Development. Disposal of waste will be seen as a last resort.

3.9.1 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.

3.9.2 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.

3.9.3 Construction Phase Waste Management

3.9.3.1 Description of the Works

The turbines and meteorological mast will be manufactured off-site and delivered to the Wind Farm Site where on site erection will occur.

The turbine and meteorological mast foundations will consist of stone, stone finishing primarily from the onsite borrow pits 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 the onsite borrow pits and/or local quarries. A large amount of the underground cabling ducting has been installed to date, with some sections of existing cable ducting to be replaced, and several sections of new cable ducting required as part of the Prospective Development. Ground preparation for these cabling works 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 Prospective Development are outlined in Table 3-2 below.

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

Material Type	Example	EWG 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
Wooden packaging	Boxes, pallets	15 01 03

Hazardous wastes that may occur on site during the construction phase of the Prospective Development 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. Hazardous wastes will be kept separate from non-hazardous wastes so that contamination does not occur.

3.9.3.2 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.

3.9.3.3 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 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.

3.9.3.4 Waste Arising from Decommissioning

The design life of the proposed renewable energy development is 25 years after that period 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 between those phases, will be infrastructural material such as the turbine foundations, turbines and the granular material used to construct roads. When the 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 Construction Phase

Material Type	Example	EWG 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

3.9.3.5 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.

3.9.3.6 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.

3.9.3.7 Implementation

3.9.3.7.1 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.

3.9.3.7.2 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.

3.9.3.7.3 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

3.9.3.8 Waste Management Plan Conclusion

The WMP will be properly adhered to by all staff involved in the construction of the Prospective Development and 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, but before the construction phase of the Prospective Development.

4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

4.1 Roles and Responsibilities

The Project Developer will ensure all planning and environmental obligations are met prior to commencement of construction of the Prospective Development. The developer will appoint a Project Contractor who will be responsible for the construction of the Prospective Development in accordance with this CEMP which will be updated by the contractor as required during the construction phase of the Prospective Development. 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 Prospective Development'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 in Figure 4-1 below.

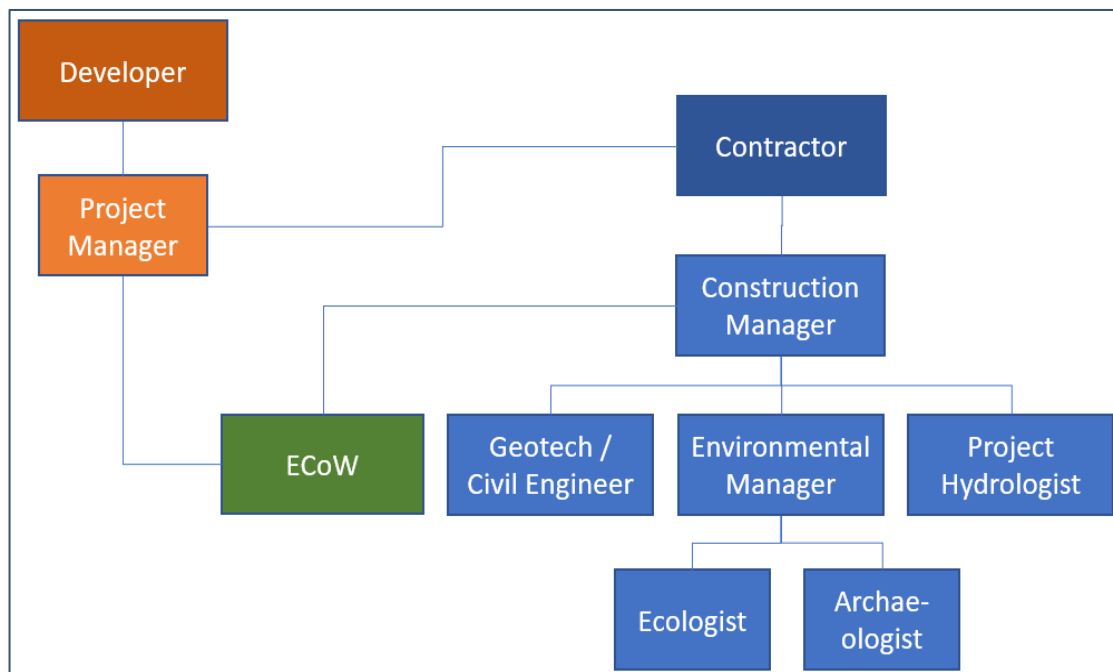


Figure 4-1 Prospective Development Organogram

Any requirement or condition 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 Prospective Development.

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 Prospective Development 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 Prospective Development'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 Prospective Development;
- 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 Prospective Development 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 Prospective Development.

4.1.3 Project Ecologist/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 Prospective Development. The Project Ecologist will not be on site full time 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 Prospective Development, 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:

- Oversight and implementation of detailed drainage design during construction;
- 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 remaining excavation works.

If new archaeological material is detected during the 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 Prospective Development. The Geotechnical Engineer will not be full time on site but will visit site at least twice 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 Prospective Development, 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.

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 which will be maintained on-site during the construction phase.

4.2.2.2 Continuous Turbidity Monitoring

Turbidity monitors or sondes are installed where 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 Prospective Development. This will not be

restricted to just these locations around the Site, with further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager.

4.2.2.4 Field Monitoring

Field chemistry measurements of unstable parameters, (pH, conductivity, temperature) will be taken at the surface water monitoring locations, as per water monitoring programme for the Prospective Development. 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 (of both the existing and proposed) , 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 (see Section 3.2.4), 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 Prospective Development 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 are to discuss the coming weeks activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same noncompliance reoccurring.

During construction of the Prospective Development, 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 Prospective Development 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 Prospective Development 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 Table 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 overhead lines 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
- 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 Prospective Development.

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 Prospective Development.

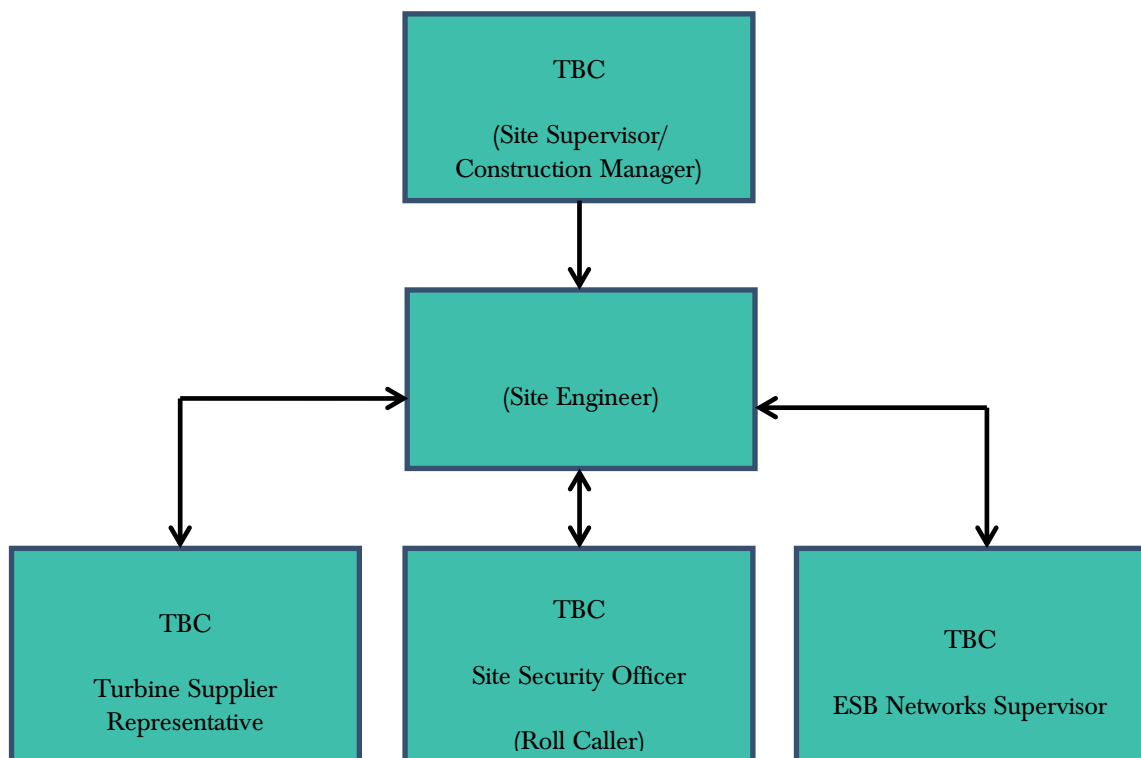


Figure 6-1 Emergency Response Procedure Chain of Command

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.
Peat instability	Excessive movement of peat on site; onset of peat slide.
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 causing 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 Prospective Development. 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 Donegal 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 Donegal 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.

6.1.5 Contingency Measures – Peat Slide

The below measures, as detailed in the Peat and Spoil Management Plan included as Appendix 4-2 of the EIAR, outline the contingency/emergency response measures to be implemented in the unlikely event of a peat slide occurring at the Wind Farm Site.

6.1.5.1 Excessive Movement

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

- All activities (if any) will cease within the affected area.
- Increased monitoring at the location will be carried out. The area will be monitored until such time as movements have ceased.
- Re-commencement of activities will only start following a cessation of movement and agreement with all parties (Contractor/Engineer/Designer).

6.1.5.2 Onset of Peat Slide

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

- On alert of a peat slide incident, all activities (if any) in the area will cease and all available resources will be diverted to assist in the required mitigation procedures.
- Action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain, the possible short run-out length to watercourses, speed of movement and the inability to predict locations it may not be possible to implement any on land prevention measures, in this case a watercourse check barrage will be implemented.
- All relevant authorities (such as Donegal County Council) will be notified if a peat slide event occurs on the Wind Farm Site.

- For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

6.1.5.3 Check Barrages

Whilst it is not anticipated based on the analysis undertaken that a peat slide will occur on Wind Farm Site, as a contingency a check barrage procedure is included below.

The check barrage procedure deals with preventing a peat slide from moving downstream within a watercourse.

The most effective method of preventing excessive peat slide debris from travelling downstream in a watercourse is the use of a check barrage. A check barrage comprises the placement of rock fill across a watercourse. The check barrage is a highly permeable construction that will allow the passage of water but will prevent peat debris from passing through. Rock fill will comprise well-graded coarse rock pieces from about 200mm up to typically 5000mm.

The rock fill for any check barrage will be sourced from the borrow pit on the Wind Farm Site.

The size of the barrage will vary depending on the scale of the peat debris to be contained and the geometry of the watercourse at the barrage location. In general, due to the low speed of a peat slide there is generally little impact force and most of the lateral load is due to fluid pressure on the upslope face of the barrage.

The check barrage will fill the entire channel width of the watercourse up to a height of 3 to 4m with a crest width of typically 3m and side slopes of about 35-45 degrees depending on the geometry of the barrage location.

Rock will not be tipped directly into open excavation in an uncontrolled manner. Its placement will be controlled by excavator operator. No construction machinery will track onto in-situ peat. In the event that machinery must track onto peat the peat will be inspected and assessed by a competent person to avoid excessive loading. If in any doubt machinery will not be tracked onto peat.

The check barrage procedure is as follows:

- Access to the check barrage location will be along the existing access roads on the Wind Farm Site and/or along public roads, where possible. When it is necessary to form the barrage then rock fill will be placed across the watercourse to effectively block the passage of peat debris.
- Operatives employed to carry out the construction of the check barrage will be inducted by means of a briefing by on-site supervisors as to the proposed location of the check barrage.
- The check barrage provides containment for peat debris in the highly unlikely event of a major peat slide. Further remedial measures, should they be required, will be assessed by the Contractor and the Project Geotechnical Engineer, and carried out as soon as physically possible when the location and extent of the failure is established.
- Where a barrage was constructed as a precaution and no peat debris reached the watercourse then the barrage will be removed as soon as any measures to prevent further peat sliding are agreed with all parties (Contractor/Engineer/Designer).

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 – Stranorlar Primary Care Centre	074 9131023

Hospital – Letterkenny University Hospital– Letterkenny	074 9125888
ESB Emergency Services	1800 372 999
Gas Networks Ireland Emergency	1800 20 50 50
Gardaí – Ballybofey Garda Station	074 9137740
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: Planree 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 involved 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 Prospective Development.

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 undergone 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 Prospective Development are set out in the various sections of the Environmental Impact Assessment Report (EIAR), NIS prepared as part of the planning application to Donegal 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 Prospective Development. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 7-1 Proposed Mitigation Measures

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Pre-Construction Drainage	EIAR Chapter 4, 9 Appendix 4-3, 4-4, 9-1	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, water crossings and onsite storage facilities for fuel, oil and chemicals . ➤ 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. ➤ 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.		
MM2	Tree Felling Drainage	EIAR Chapter 4, 9 Appendix 4-3, 4-4	To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities. ➤ The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing. ➤ All roads and culverts will be inspected prior to any machinery being brought on Site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings. ➤ Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas. ➤ New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3% - 3% gradient), to minimise flow velocities.		

			➤ All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. ➤ All new collector drains will taper out before entering the aquatic buffer zone to ensures the discharging water gently fans out over the buffer zone before entering the aquatic zone. ➤ Machine combinations, such as mechanical harvesters or chainsaw felling will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance. ➤ Mechanised operations will be suspended during and immediately after heavy rainfall. ➤ Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement. ➤ Brash which has not been pushed into the soil may be moved within the Site to facilitate the creation of mats in more demanding locations. ➤ Felling of trees will be pointed directionally away from watercourses. ➤ Felling will be planned to minimise the number of machine passes in any one area. ➤ Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible. ➤ Harvested timber will be stacked in dry areas, and outside any 50m watercourse buffer zone. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites. 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 removing of natural debris deflectors will be avoided.		
MM3	Waste Management	EIAR Chapter 4 Appendix 4-3	Prior to the re-commencement of construction work at the Site, 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.		

MM4	Construction Environmental Management Plan	EIAR Chapter 4 Appendix 4-3	The requirement for a CEMP to be prepared in advance of any construction works commencing on any wind farm development site and submitted for agreement to the Planning Authority is now well-established. The procedures for the implementation of the mitigation measures outlined in the CEMP and their completion is audited by way of a CEMP Audit Report.		
MM5	Upgrade of Existing Founded Access Road		For upgrading of all existing founded access roads the following will apply: ➤ Excavation of the access road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill. ➤ Benching of the excavation will be required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm. ➤ Access roads will be finished with a layer of capping/surfacing material across the full width of the road. ➤ For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability		
MM6	Upgrade of Existing Floating Road to Founded	Appendix 4-3 Appendix 8-1	7. Existing floating access roads construction will consist of ➤ Prior to any upgrading works, peat probing, hand shear vane testing and full-scale proof load testing will be carried out along each of the existing floating roads. ➤ Prior to commencing upgrade works 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. ➤ The surface of the existing access road will be graded/tidied up prior to the placement any additional material. ➤ Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. 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.		

			➤ The construction of these access roads will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.		
MM7	Upgrade of Existing Floating Road to Founded	Appendix 4-3	Upgrading of existing floating access road will consist of: ➤ Prior to any upgrading works, peat probing, hand shear vane testing and full-scale proof load testing will be carried out along each of the existing floating roads. See 'Peat Stability Assessment Report' in Appendix 8-1 of the EIAR for details. ➤ Prior to commencing upgrade works 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. ➤ The surface of the existing access road will be graded/tidied up prior to the placement any additional material. ➤ Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. 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. ➤ The construction of these access roads will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.		
MM8	Construction of new Floating Road (BMEP Site)	Appendix 4-3	➤ Prior to commencing 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. ➤ Prior to any upgrading works, peat probing and hand shear vane testing will be undertaken along the route of the track. ➤ To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating track will be tipped over at least a 10m length of constructed floating road. ➤ Where it is not possible to end-tip over a 10m length of constructed floating road then dumpers delivering stone to the floating track 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		
MM9	Upgrade of Floating Road (BMEP Site)	Appendix 4-3	➤ Prior to commencing floating track construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m. ➤ Prior to any upgrading works, peat probing and hand shear vane testing will be undertaken along the route of the track. ➤		
MM10	Temporary Drainage Works	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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 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; and, ➤ A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
MM11	Pre- Construction Drainage	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. 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.		

			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 Subject Development 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 Wind Farm Site 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 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.		
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MM12	Pre- Construction Drainage	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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 Ch. 9: Hydrology and Hydrogeology of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines. ➤ The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing. ➤ All roads and culverts will be inspected prior to any machinery being brought on Site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings. ➤ Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas. ➤ New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3% - 3% gradient), to minimise flow velocities. ➤ All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. ➤ All new collector drains will taper out before entering the aquatic buffer zone to ensures the discharging water gently fans out over the buffer zone before entering the aquatic zone. ➤ Machine combinations, such as mechanical harvesters or chainsaw felling will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance.		
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			➤ Mechanised operations will be suspended during and immediately after heavy rainfall. ➤ Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement. ➤ Brash which has not been pushed into the soil may be moved within the Site to facilitate the creation of mats in more demanding locations. ➤ Felling of trees will be pointed directionally away from watercourses. ➤ Felling will be planned to minimise the number of machine passes in any one area. ➤ Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible. ➤ Harvested timber will be stacked in dry areas, and outside any 50m watercourse buffer zone. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites. ➤ 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 removing of natural debris deflectors will be avoided.		
Construction Phase					
MM13	Road Construction	EIAR Chapter 4 Appendix 4-2 PSMP	To provide access within the Wind Farm Site and to connect the proposed turbines and associated infrastructure existing roads will need to be upgraded. The road construction preliminary design has taken into account the following key factors; ➤ Buildability considerations ➤ Maximising use of existing infrastructure ➤ Minimising excavation arisings ➤ Peat stability ➤ Serviceability requirements for construction and wind turbine delivery and maintenance vehicles ➤ Requirement to minimise disruption to peat hydrology.		
MM14	Road Construction	EIAR Chapter 4	The existing forest track will be upgraded by laying a new surface dressing on the existing section of roadway where necessary. The new forest track will be designed as 'Build On-Top		

		Appendix 4-2 PSMP	Embankment Roads' (Floating Roads) in accordance with the COFORD (2004) 'Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads'. Floating roads minimise the impact on peat, particularly peat hydrology, and significantly reduce the volumes of peat requiring management as there is no excavation required and no peat arisings are generated.		
MM15	Health and Safety of Borrow Pit	EIAR Chapter 4 Appendix 4-2 PSMP	Upon removal of the rock from the borrow pits, it is proposed to reinstate the borrow pits using excavated peat and spoil. Once reinstatement is complete, the perimeter of the borrow pits will be permanently secured with a stock-proof fence erected around the borrow pit area to prevent access to these areas in the interest of health and safety. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced area.		
MM16	Blasting on Site	EIAR Chapter 4, 12 Appendix 4-3 CEMP	The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Síochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast. A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon one blast finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Chapter 12: Noise and Vibration. Any blasting will be carried out in accordance with the <i>Guidance on the Safe Use of Explosives in Quarries</i> (Safety and Health Commission for the Mining and Other Extractive Industries, 2002)⁹ and the British Standard BS 5228-1:2009+A1:2014 <i>Code of practice for noise and vibration control on construction and open sites – Noise</i>¹⁰. Blasting will only be carried out after notifying any potentially sensitive receptors.		

⁹https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf

¹⁰<https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965>

MM17	Borrow Pit	EIAR Chapter 4, 8 Appendix 4-3 CEMP	The excavated rock from the borrow pits will be used in the construction of the infrastructure elements (turbine bases, roads, etc.) at the Wind Farm Site. The Contractor will be required to develop the borrow pits in a way which will allow the excavated peat and spoil to be placed safely. It is proposed to construct cells within the borrow pit (BP3) for the placement of the excavated peat and spoil. This is to allow for the safe placement and grading of the peat and spoil using dumper trucks and excavators. It also eliminates the need to construct above ground retaining structures which may have an unnecessary visual impact and increase the development footprint of the proposed wind farm. The design and construction commitments for the borrow pits are detailed below. 1. Peat and overburden will be removed and stored within the void at the existing borrow pits. The rock within the proposed borrow pit footprint will be removed by blasting. 2. It is proposed to construct the borrow pits so that the base of the borrow pits are below the level of the adjacent section of access road. 3. Slopes within the excavated rock formed around the perimeter of the borrow pits will be formed at stable inclinations to suit local in-situ rock conditions. Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance. 4. The stability of the rock faces within the borrow pits will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines. 5. BP3 will be constructed with individual cells divided by an in-situ rock buttress which will be inspected and approved by the Project Geotechnical Engineer. See Drawing P24-234-0602-0006 of the PSMP in Appendix 4-2 of the EIAR for the location of the rock buttress. 6. Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. The contractor excavating the rock will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely.		
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			7. The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required. 8. The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit. The surface of the placed spoil will have a maximum grade of 5°. 9. An interceptor drain will also be installed around the perimeter of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction, and also when reinstated. 10. Temporary control of groundwater within the borrow pit will be required. A temporary pump and suitable outfall locations will be required during construction. 11. A settlement pond will be constructed at the lower side/outfall location of the borrow pit and is shown on the drainage drawings. 12. The acrotelm will be placed with the vegetation part of the sod facing the right way up (where practicable) to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit. 13. Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit. 14. All the above-mentioned requirements will be implemented by the Contractor during construction.		
MM18	Watercourse Crossing	EIAR Chapter 4, 9 Appendix 4-3 Appendix 4-4	Watercourse crossings will be constructed to the specifications of the Office of Public Work (OPW) bridge design guidelines ' <i>Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945</i> ', and in consultation with Inland Fisheries Ireland (IFI).		
MM19	Watercourse Crossings within the BMEP Site	EIAR Chapter 6, 9	The proposed BMEP works only includes 1 no. round of deforestation in comparison to the Do-Nothing Scenario in which the BMEP Site would be felled and replanted several times. Where temporary crossings cannot be avoided, the following measures will be applied:		

		Appendix 4-3	➤ No instream works will be undertaken. ➤ No watercourse will be interfered with and temporary bridge construction will ensure that water flow will not be impeded and conveyance of increased water flow resulting from above normal rainfall. ➤ Movement of fish will not be impeded. ➤ Crossings points will be constructed at right angles to the water flow. ➤ On sloping ground, temporary bridges to be constructed in a 'Hump Back' fashion. This will reduce the risk of silt flowing down the wheel ruts and directly entering the stream/drain being crossed. ➤ Any run-off will be diverted onto a buffer strip at a suitable point well above the stream. ➤ The machine track leading to the bridge will be very well brashed and ruts that can act as water channels down to the stream will not be allowed to develop ➤ Bridging logs will be placed from top of bank to top of bank to ensure that the natural stream banks are left intact. ➤ The temporary watercourse crossings will be removed following the completion of the works.		
MM20	Culvert Crossings	EIAR Chapter 4, 9 Appendix 4-3 Appendix 4-4	All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
MM21	Drainage Design Principals	EIAR Chapter 4, 9	The key principles of drainage design that will be implemented and adhered to as part of the Prospective Development are as follows:		

		Appendix 4-3, 4-4	➤ Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge/recharge to ground. ➤ Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas. ➤ There is no direct hydraulic connectivity from proposed construction areas to natural watercourses or drains connecting to downstream watercourses. ➤ Maintain the existing hydrology/hydrogeology of the Site. ➤ Re-routing existing local drainage pathways as required. ➤ Daily inspection and recording of surface water management system by on-site 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. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at a minimum of 50m and 100m distance from streams and lakes respectively.		
MM22	Interceptor Drains	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. This will minimise the volume of potentially silty runoff to be managed within the construction area. The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains may have to be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting as conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains would be maintained in localised areas along the roadway with culverts		

			under the roadway, which would allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts may be left in situ following construction. The velocity of flow in the interceptor will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the channel is non-erosive. On steeper sections where erosion risks are greater, a geotextile membrane will be added to the channel. Interceptor drains will be installed horizontally across slopes to run in parallel with the natural contour line of the slope. Intercepted water will travel along the interceptor drains to areas downgradient of works areas, where the drain will terminate at a level spreader. Across the entire length of the interceptor drains, the design elevation of the water surface along the route of the drains will not be lower than the design elevation of the water surface in the outlet at the level spreader		
MM23	Swales	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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.		
MM24	Check Dams	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. Check dams may also be installed in some of the existing artificial drainage channels on the Site, downstream of where drainage swales connect in. The check dams will be installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam is at the same level as the top elevation of the next		

			down-gradient check dam in the drain. The centre of the check dam will be approximately 150mm lower than the edges to allow excess water to overtop the dam in flood conditions rather than cause upstream flooding or scouring around the dams. Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be left in place at the end of the construction phase to limit erosive linear flow in the drainage swales during extreme rainfall events.		
MM25	Level Spreaders	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. The water carried in interceptor drains will not have come in contact with works areas of the Site, and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope in order to prevent erosion. The slope in the channel leading into the spreader will be less than or equal to 1%. The slope downgradient of the spreader onto which the water will dissipate will have a grade of less than 6%. The availability of slopes with a grade of 6% or less will determine the locations of level spreaders. If a slope grade of less than 6% is not available in the immediate area downgradient of a works area at the end of a diversion drain, a piped slope drain will be used to transfer the water to a suitable location. The spreader lip over which the water will spill will be made of a concrete kerb, wooden board, pipe, or other similar piece of material that can create a level edge similar in effect to a weir. The spreader will be level across the top and bottom to prevent channelised flow leaving the spreader or ponding occurring behind the spreader. The top of the spreader lip will be 150mm above the ground behind it. The length of the spreader will be a minimum of 4m and a maximum length of 25m, with the actual length of each spreader to be determined by the size of the contributing catchment, slope and ground conditions.		

			Clean four-inch stone can be placed on the outside of the spreader lip and pressed into the ground mechanically to further dissipate the flow leaving the level spreader over a larger area.		
MM26	Piped Slope Drain	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. The piped slope drains will be semi-rigid corrugated pipes with a stabilised entrance and a rock apron at the outlet to trap sediment and dissipate the energy of the water. The base of drains leading into the top of the piped slope drain will be compacted and concavely formed to channel the water into the corrugated pipe. The entrance at the top of the pipe will be stabilised with sandbags if necessary. The pipe will be anchored in place by staking at approximately 3-4 metre intervals or by weighing down with compacted soil. The bottom of the pipe will be placed on a slope with a grade of less than 1% for a length of 1.5m, before outflowing onto a rock apron. The rock apron at the outlet will consist of 6-inch stone to a depth equal to the diameter of the pipe, a length six times the diameter of the pipe. The width of the rock apron will be three times the diameter of the pipe where the pipe opens onto the apron and will fan out to six times the diameter of the pipe over its length. Piped slope drains will only remain in place for the duration of the construction phase of the Prospective Development. On completion of the works, the pipes and rock aprons will be removed, and all channels backfilled with the material that was originally excavated from them.		
MM27	Vegetation Filters	EIAR Chapter 4, 9	The selection of suitable areas to use as vegetation filters was determined by the size of the contributing catchment, slope, and ground conditions. Vegetation filters are not used in isolation for waters that were likely to have higher silt loadings. In such cases, silt-bearing water had already passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader.		

		Appendix 4-3, 4-4			
MM28	Stilling Ponds (Settlement Ponds)	EIAR Chapter 4, 9 Appendix 4-3, 4-4	Stilling ponds will be used to attenuate runoff from works areas of the Prospective Development during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Prospective Development during the operational phase.. 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. Stilling ponds will be excavated/constructed at each required location as two separate ponds in sequence, a primary pond and a secondary pond. The points at which water enters and exits the stilling ponds will be stabilised with rock aprons, which will trap sediment, dissipate the energy of the water flowing through the stilling pond system, and prevent erosion. The primary stilling pond will reduce the velocity of flows to less than 0.5 metres per second to allow settlement of silt to occur. Water will then pass from the primary pond to the secondary pond via another rock apron. The secondary stilling pond will reduce the velocity of flows to less than 0.3 metres per second. Water will flow out of the secondary stilling pond through a stone dam, partially wrapped in geo-textile membrane, which will control flow velocities and trap any sediment that has not settled out. Water will flow by gravity through the stilling pond system. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. The stilling ponds will be dimensioned so that the length to width ratio will be greater than 2:1, where the length is the distance between the inlet and the outlet. Where ground conditions allow, stilling ponds will be constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond will be a minimum of 1-1.5 metres in depth. Deeper ponds will be used to minimise the excavation area needed for the required volume. The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds		

			area. All material excavated during pond construction will be used locally for landscaping and berm construction around these ponds. Stilling ponds will be located towards the end of swales, close to where the water will be reconverted to diffuse sheet flow. Upon exiting the stilling pond system, water will be immediately reconverted to diffuse flow via a fan-shaped rock apron if there is adequate space and ground conditions allow. Otherwise, a swale will be used to carry water exiting the stilling pond system to a level spreader to reconvert the flow to diffuse sheet flow.		
MM29	Siltbuster	EIAR Chapter 4, 9 Appendix 4-3, 4-4	A “siltbuster” or similar equivalent piece 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. 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. The Siltbuster units are now considered best practice for the management of dirty water pumped from construction sites. The UK Environment Agency and the Scottish Environmental Protection Agency have all recommended/specified the use of Siltbuster units on construction projects.		
MM30	Silt Bags	EIAR Chapter 4, 9 Appendix 4-3, 4-4	Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. 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. The dewatering silt bag, when full (approximately four tonnes of silt), will be removed from Site by a waste contractor with the necessary waste collection permit, who will then transport the silt bag to an appropriate, fully licensed waste facility.		

MM31	Sedimats	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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 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.		
MM32	Silt Fences	EIAR Chapter 4, 9 Appendix 4-3, 4-4	Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50m buffer zone of a stream, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Prospective Development. 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 '<i>Control of Water Pollution from Linear Construction Projects</i>' 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.		
MM33	Hydrocarbon Interceptor	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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 Prospective Development (i.e., construction compounds and substation compound).		

MM34	Transverse Drains (Grips)	EIAR Chapter 4, 9 Appendix 4-3, 4-4	On sections of access road, transverse drains ('grips') are constructed within the surface layer to divert runoff into swales or roadside drains. These drains can run perpendicularly from edge to edge of the road and are most commonly used on steeper gradients to prevent surface water from flowing down the centreline, thereby reducing the risk of erosion and protecting the road structure.		
MM35	Cable Trench Drainage	EIAR Chapter 4, 9 Appendix 4-3, 4-4	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. This approach will also be adopted where new cable trenching sections are required, and replacement/upgrade of cable trenching is required. 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 Prospective Development, would be transported to one of the on-site designated peat and spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site. On steeper slopes, silt fences, 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.		
MM36	Site Drainage Management	EIAR Chapter 4, 9	Preparative Site Drainage Management All materials and equipment necessary to implement the drainage measures will be brought on-site in phases as they are required during the construction phase. A sufficient number of straw		

		Appendix 4-3, 4-4	bales, clean drainage stone, terram, stakes, etc. will be kept on-site at all times to implement the drainage design measures as necessary. Pre-emptive Site Drainage Management The works programme for the groundworks part of the construction phase of the Prospective Development 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.		
MM37	Site Entrances	EIAR Chapter 4, 15	The Prospective Development will continue to be accessed via the existing site entrance off the N15 National Road to the west of the Wind Farm Site. This entrance will facilitate general construction access and delivery of abnormal loads to the Wind Farm Site. Appropriate sightlines have been established to the north and south of the entrance for the safe egress of traffic.		
MM38	Traffic Management	EIAR Chapter 4, 15 Appendix 15-2	The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users. 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 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. All turbine deliveries will be provided for in a Traffic Management Plan which will be finalised in advance of oversized load deliveries, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. Such a Traffic Management Plan is typically submitted to the relevant		

			Authorities for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.		
MM39	Concrete Pouring	EIAR Chapter 4, 9, 10, 11 Appendix 4-3	Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. Before leaving the Site, washing of the delivery truck will be minimised and restricted to designated wash out areas. This wash-out area is proposed for continued use during the construction of the Prospective Development. Wash out will be restricted to the concrete lorry's chute only. 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. Concrete lorries will be washed out fully at the off-site batching plant, where facilities are already in place. Concrete wash-out areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste by an appropriately authorised waste collector for disposal at an authorised waste facility. Alternatively, a Siltbuster-type concrete wash unit or equivalent¹¹ may be used.		
MM40	Dust Suppression	EIAR Chapter 4, 5, 10, 11	In periods of extended dry weather, dust suppression may be necessary within the Wind Farm Site, along haul roads, proposed new site roads, and proposed upgrades to existing site roads, to prevent dust from becoming a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Wind Farm Site drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds		

¹¹ (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/)

			to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff. ➤ 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 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 Prospective Development will be covered by tarpaulin where necessary. ➤ If necessary, excavated material will be dampened prior to transport to the peat and spoil management areas. ➤ 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 Prospective Development to reduce the amount of emissions associated with vehicle movement. ➤ Groundworks (i.e., works with potential to create dust) associated with proposed turbines will be fully supervised by an ECoW. ➤ The ECoW will regularly monitor adjacent Annex I habitat for signs of degradation.		
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			➤ The ECoW will have power to halt construction works if required.		
MM41	Vehicle Washing	EIAR Chapter 4, 9, 10, 11	Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. It is not anticipated that vehicle or wheel washing facilities will be required as part of the construction phase of the Prospective Development as the majority of site roads are existing facilitating regular or frequent deliveries to the Wind Farm Site (e.g. with steel or concrete). Site roads are well finished with compacted hardcore, hence 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 Prospective Development.		
MM42	Waste Management	EIAR Chapter 4, 10, 11, 15	The waste management plan (WMP) is located within the CEMP which outlines the best practice procedures during the construction phase. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Prospective Development. Disposal of waste will be a last resort. The WMP was updated in line with the EPA's 2021 document '<i>Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects</i>' (EPA, 2021)¹². The WMP has been prepared to outline the main objectives that are to be adhered to facilitate the preparation of a more detailed WMP prior to the construction phase of the Prospective Development. The WMP will be in place throughout the construction and decommissioning phases of the Subject Development. 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.		

¹² EPA 2021 [Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects](https://www.epa.ie/publications/circular_economy/resources/CDWasteGuidelines.pdf). Available at: https://www.epa.ie/publications/circular_economy/resources/CDWasteGuidelines.pdf

			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.		
MM43	Construction Timing	EIAR Chapter 4, 7	It is estimated that the construction phase of the Prospective Development will take approximately 12 months from commencement of civil works to the full commissioning of the wind turbines. The commencement of works where the removal of vegetation is required, or where works take place in sensitive breeding habitats will be scheduled to occur outside the bird breeding season (1st March to 31st August) to avoid any potentially significant effects on nesting birds. Construction may commence from September to March so that construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout the bird breeding season. Construction activities will be carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday). However, to ensure that optimal use is made of good weather period or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine components along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority.		
MM44	Peat Stability	EIAR Chapter 4 Appendix 4-3	Excessive loading of insitu peat ➤ No further construction of floating roads on the Wind Farm Site is to be carried out. Given the potential risk associated with floating road construction alternative methods of construction shall be adopted. ➤ No loading of insitu peat. The instability recorded on site in all cases can be contributed to various degrees to excessive placed construction loading onto the insitu peat surface. Identifying body of weak peat in proximity to proposed works		

			➤ Confirmatory re-testing and assessment in zone of influence in advance of construction works. The peat failure of 12 November 2020 occurred due to an unforeseen body of very weak peat adjacent to the working area. Further confirmatory re-testing to be completed immediately prior to works recommencing in each area of site to ensure no change in ground conditions. Accidental excessive loading of insitu peat during construction ➤ Site supervision and permit to work with respect to peat stability. All construction on site shall be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety. Identifying areas of potential weak peat in advance of works completion of works ➤ Monitoring of ground movement and constructed works. In order to monitor the performance of the constructed works within the peat areas, and any further construction works to be carried out, a series of monitoring points shall be established throughout the site. ➤ Proof testing of floating roads. Full-scale proof load tests to be carried out on floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road. Degradation of work due to inclement weather ➤ Construction and weather conditions. Restrictions on work during or after periods of heavy or sustained rainfall. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure.		
MM45	Construction of Turbine Base	EIAR Chapter 4, 8	The turbine base will be founded on competent founding strata which will require excavation through peat and any soft subsoils. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.		

			The formation material will have to be approved by an engineer as meeting the turbine manufacturer's requirements. If the formation level is reached at a depth greater than the depth of the foundation, the ground level will be raised with Clause 804 (Cl804) or similar hardcore material, compacted in 250 millimetres (mm) layers, with sufficient compacted effort (i.e. compacted with seven passes using 12 tonne roller). Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will be pumped to an adjacent settlement pond.		
MM46	Peat Stability	EIAR Chapter 4, 8 Appendix 4-2, 4-3	With respect to minimising any adverse impacts on peat stability, the following procedures will be followed during construction of turbine bases, hardstanding areas and met mast foundation in relation to excavations in peat: ➤ All excavated peat and spoil to be stored in appropriately designed locations, such as within the existing borrow pits and the proposed extension to the borrow pit. No material will be side cast on the peat slopes. ➤ All excavations within peat will be adequately supported or peat slopes will be battered to a safe slope inclination typically of 1(v): 3(h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required. ➤ Excavations will be kept reasonably free from water at all times. Water will be prevented from being impounded within excavations by either using drainage channels cut into the excavation face or by pumping. ➤ Where water is channelled or pumped from an excavation then this water will be fed into an established watercourse or drainage ditch following suitable treatment.		
MM47	Peat Stability	EIAR Chapter 4, 8 Appendix 4-2, 4-3	Upgrading of Existing Founded Access Roads will be constructed using the following measures which attempt to minimise any adverse impact on peat stability. ➤ Access road construction will be to the line and level requirements as per design/planning conditions. ➤ For upgrading of all existing founded access roads the following will apply:		

			○ Excavation of the access road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill. ○ Benching of the excavation will be required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm. ○ Access roads will be finished with a layer of capping/surfacing material across the full width of the road. ○ For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability. For upgrading of existing access roads previously constructed using a floated construction technique the following will apply: ➤ Daily monitoring of these monitoring posts will be undertaken while works are ongoing in specific areas. ○ The existing floating roads will be incrementally removed by pulling back the engineering fill material and base layer, before constructing the new road using the excavate and replace/partial displacement method. ○ The roads will be built incrementally, with peat removed before being backfilled with coarse rock sourced from the borrow pit where the peat is relatively shallow (<2m). The lateral extent of excavation will be limited to 3m (effective reach of an excavator) before being backfilled. The excavator will work from the road at all times and will not track or operate directly on the peat surface. ○ Rock fill from the borrow pit will be transported to the roads and berm using A25 dumpers, with the coarse rock tipped onto the constructed section of road before being used to backfill the excavation. Rock will not be end tipped directly from dumpers into the excavation. ○ Where areas of deeper or weaker peat are encountered, the partial displacement method is proposed. This removes the peat down to the stable		
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			depth of excavation but will leave a layer of peat in place at the base of the excavation. ○ Coarse boulders (>0.5m, with no fine material) will be used in the base of the excavation and will be pushed into the base of the weaker peat to the solid stratum below the peat. This displaces the peat upwards, filling the voids between the coarse boulder fill. ➤ The finished road will have a minimum running width of 5m, with wider sections on bends and corners. ➤ The construction of access roads in areas of deep peat (greater than 3m) will be inspected on a daily basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.		
MM48	Construction Management Targets	Appendix 4-3	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 housekeeping 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.		
MM49	Hygiene on Site	Appendix 4-3	➤ 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.		

MM50			>		
MM51	Refuelling on Site	EIAR Chapter 4, 8, 9, Appendix 4-3	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 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 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; > Fuels stored on the 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;		
MM52	Spill Control Measures	Chapter 8,9	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.		

		Appendix 4-3	➤ 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.		
MM53	Concrete and Cement on Site	Appendix 4-3	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.		

			Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. Before leaving the Site, washing of the delivery truck will be minimised and restricted to designated wash out areas. There is an existing wash-out area on site, located southeast of T10 along the site access road. This wash-out area is proposed for continued use during the construction of the Prospective Development. Wash out will be restricted to the concrete lorry's chute only. 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. A temporary lined impermeable containment area exists on site for use during construction, and was built using straw bales and lined with an impermeable membrane. Concrete lorries will be washed out fully (i.e. beyond just the chute) at the off-site batching plant, where facilities are already in place. During the construction phase, concrete wash-out areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste by an appropriately authorised waste collector for disposal at an authorised waste facility.		
MM54	Air Pollution from Construction	EIAR Chapter 10 Appendix 4-3	The risks of pollution arising from concrete deliveries will be further reduced by the following: ➤ Concrete trucks will not be washed out on-site but will be directed back to their batching plant for washout. ➤ Remaining site roads will initially be constructed with a subgrade and compacted with the use of a roller to allow concrete delivery trucks access all areas where the concrete will be needed. The final wearing course for the roads will not be provided until all turbine foundations have been poured. No concrete will be transported around the Wind Farm Site in open trailers or dumpers so as to avoid spillage while in transport. All concrete used in the construction of turbine foundations will be pumped directly		

			into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed. ➤ The arrangements for concrete deliveries to the Wind Farm Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures. ➤ Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Wind Farm Site.		
MM55	Hydrological Receptors	EIAR Chapter 9 Appendix 4-3	The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures to be properly installed and operate effectively. The buffer/setback zone will: ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.		
MM56	Archaeological Management	EIAR Chapter 14 Appendix 4-3	➤ A buffer zone of 10m will be established around the potential Cultural Heritage feature within the Western block prior to the commencement of clear-felling in this area. The buffer will comprise durable post-and-wire fencing with 'Keep Out' signage. ➤ A walk-over survey of the BMEP Site (both Eastern and Western blocks) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.		

			➤ Archaeological monitoring under licence from the NMS of any further peat removal required as part of the construction stage of the Prospective Development will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ A walk-over survey of the BMEP Site (both Parcel 1 and Parcel 2) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary. ➤ A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented.		
MM57	Noise Control	EIAR Chapter 5, 12 Appendix 4-3	The contract documents will specify that the Contractor undertaking 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. To ameliorate any potential noise impacts that may present during the construction phase, a schedule of noise control measures has been formulated in accordance with best practice guidance. The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria: ➤ 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;		

			➤ Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; ➤ Selection of plant with low inherent potential for generation of noise and/ or vibration where practical; ➤ Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and; ➤ 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. Where rock breaking is employed in relation to the proposed borrow pit locations or other locations across the Site, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities: ➤ Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. ➤ Ensure all leaks in air lines are sealed. ➤ Use a dampened bit to eliminate ringing. Air overpressure from a blast is difficult to control, however, because of its variability much can be done to reduce the effect. A reduction in the amount of primer cord used, together with the adequate burial of any that is above the ground, can give dramatic reduction to air overpressure intensities especially in the audible frequency range. Most complaints are likely to be received from an area downwind of the blast site, and therefore, if air blast complaints are a continual problem, it would be advisable to postpone blasting during unfavourable weather conditions if possible. As air blast intensity is a function of total charge weight, then a reduction in the total amount of explosives used can also reduce the air overpressure value. Further guidance will be obtained from the recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 in relation to blasting operations.		
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			The methods used to minimise impacts will consist of the following: ➤ Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). ➤ The firing of blasts at similar times to reduce the ‘startle’ effect. ➤ On-going circulars informing people of the progress of the works. ➤ The implementation of an onsite documented complaints procedure. ➤ The use of independent monitoring for verification of results. ➤ Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence. 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.		
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MM58	Management of Bird Species/ Habitats	EIAR Chapter 7 Appendix 4-3	➤ Construction works will not take place in the vicinity of the most recent hen harrier nest site until the forestry canopy closes at this location, to ensure no short-term loss of nesting habitat. ➤ Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). ➤ A pre-construction bird survey at the Wind Farm Site will be organised to ensure that any sensitive roost or nest sites in the works area are identified and disturbance to these are avoided. This will include surveys targeted towards hen harrier and long-eared owl (further details are provided in Appendix 7-7 of the EIAR). There will be a particular emphasis on nesting hen harrier, especially in proximity to the known previous nest sites. ➤ Construction phase surveys will be conducted, including a dedicated breeding hen harrier survey (further details are provided in Appendix 7-7 of the EIAR). If winter roosting or be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022; NatureScot, 2022; or other relevant literature). No works shall be permitted within the buffer until it can be demonstrated that the birds are no longer dependent on the roost/nest. The most recent NatureScot guidance (NatureScot, 2022) suggests a disturbance distance of 300-750m for hen harrier during the breeding season, while the Forestry Commission of Scotland (2006) recommends 500-1000m. The appropriate disturbance buffer will depend on the scale and duration of the works occurring at the time, as well as the connectedness/sightlines to the nest site, and the time of year. If breeding hen harrier are identified, a suitably qualified Ecological Clerk of Works (ECoW) will be appointed to conduct an assessment to determine the construction restrictions required to avoid disturbance to the pair or their young, or damage to habitat depended on by the pair of their young. Taking a precautionary approach, the assessment will begin with a potential disturbance buffer of 500-1000m around the breeding area, depending on the particulars of the nest location, to be determined by the ECoW. The ECoW will monitor the response of the hen harrier and adapt the disturbance buffer if necessary. ➤ The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. Where sections of woody vegetation are removed		
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			for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context. ➤ During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. 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. ➤ Silt fences will be installed as an additional water protection measure around existing watercourses.		
Decommissioning Phase					
MM59	Decommissioning	EIAR Chapter 4 Appendix 4-6	The Decommissioning Plan will be updated prior to the end of the operating period in line with decommissioning methodologies that may exist at that time and will be agreed with the competent authority prior to the commencement of decommissioning of the wind farm. The potential for effects during the decommissioning phase of the Meenbog Wind Farm has been fully assessed in the EIAR.		

MM60	Decommissioning	EIAR Chapter 4 Appendix 4-6	➤ In decommissioning the Meenbog Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine components will be separated and removed offsite. The turbine materials will be transferred to a suitable recycling or recovery facility. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environmental emissions such as noise, dust and/or vibration. ➤ The underground electrical cabling connecting the turbines to the onsite 110kV substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.		
EIAR Chapter 5: Population and Human Health					
Pre-construction Phase					
MM61	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.		
MM62	Traffic and Transport	EIAR Chapter 5	A Traffic Management Plan (TMP) has been developed in order to minimise any potential effect on the local population during the construction phase of the Proposed Project due to traffic.		

		Appendix 15-2			
Construction Phase					
MM63	Human Health	EIAR Chapter 5 Appendix 4-3	The Prospective Development 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). ➤ 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 Wind Farm 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 Wind Farm Site.		

			➤ The suitability of machinery and equipment for use near power lines will be risk assessed. ➤ All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Wind Farm Site are made aware of the location of lines before they come on to Site. ➤ Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. ➤ When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. ➤ Information on safe clearances will be provided to all staff and visitors. ➤ Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and 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 2021'¹³. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. The scale and scope of the Prospective Development 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		
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¹³ Health & Safety Authority (2013) *Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/construction/guidelines_on_the_procurement_design_and_management_requirements_of_the_safety_health_and_welfare_at_work_construction_regulations_2013_updated_.pdf

			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): ➤ Review previously identified hazards and identify any new 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;		
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			○ 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.		
MM64	Noise and Vibration	Chapter 5, 12 Appendix 4-3	Best practice measures for noise control will be adhered to on-site during the construction phase of the Prospective Development including, but not limited to; ➤ 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; ➤ Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; ➤ Selection of plant with low inherent potential for generation of noise and/or vibration where practical; ➤ Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and; ➤ 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.		
MM65	Major Accidents and Natural Disasters	EIAR Chapter 5, 8, 9, 16 Appendix 4-3	The Prospective Development has been designed and will be built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.		

			The Prospective Development will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		
Operational Phase					
MM66	Health and Safety	EIAR Chapter 5	The following mitigation measures will be implemented during the operation of the Prospective Development to ensure that the risks posed to staff and landowners remain imperceptible throughout the operational life of the Prospective Development; ➤ 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 Prospective Development 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 Onsite 110kV Substation, which is operated by EirGrid is 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. ➤ 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.		
MM67	Shadow Flicker	EIAR Chapter 5	<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. <u>Wind Turbine Control Measures</u> If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed, 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. All predicted incidents of shadow flicker can be pre-programmed into the wind farm's control software. The wind farm's SCADA control system can be programmed to shut down any particular turbine at any particular time on any given day to avoid excessive shadow flicker occurrences at properties which are not naturally screened or cannot be screened with measures outlined above. Where such wind turbine control measures are to be utilised, they need only be implemented when the specific combined circumstances occur that are necessary to give rise to the shadow flicker effect in the first instance. Therefore, if the sun is not shining on a particular day that shadow flicker was predicted to occur at a nearby property, there would be no need to shut down the relevant turbines that would have given rise to the shadow flicker at the property. Similarly, if the wind speed was below the cut-in speed that caused the turbine rotor to rotate and give rise to a shadow flicker effect at a nearby property, there would be no need to shut down the relevant turbines that otherwise would have caused shadow flicker. In order to ensure that the model and SCADA system is accurate and working well a site visit will be carried out to verify the system. The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties and the following process will be adhered to. 8. <i>Recording the weather conditions at the time of the site visit, including wind speeds and direction (i.e. blue sky, intermittent clouds, overcast, moderate breeze, light breeze, still etc.).</i> 9. <i>Recording the house number, time and duration of site visit and the observation point GPS coordinates.</i>		
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			10. Recording the nature of the sensitive receptor, its orientation, windows, landscaping in the vicinity, any elements of the built environment in the vicinity, vegetation. 11. In the event of shadow flicker being noted as occurring the details of the duration (times) of the occurrence will be recorded. 12. The data will then be sent to the wind farm operational team to confirm that the model and SCADA system are working. 13. Following 12 months of full operation of the Proposed Project a report can be prepared for the Local Authority describing the shadow flicker mitigation measures used at the wind farm and confirming the implementation and successful operation of the system. This method of shadow flicker mitigation has been technically well-proven at wind farms in Ireland and also in areas outside Ireland that experience significantly longer periods of direct sunlight. In order to demonstrate how the SCADA control system can be applied to switch off particular turbines at the relevant times and dates, In this case, the relevant turbine(s) would be programmed to switch off for the time required to reduce daily shadow flicker to below the guideline limit of 30 minutes. The SCADA control system would be utilised to control shadow flicker in the absence of being able to agree alternative mitigation measures with the relevant property owner. Where a shadow flicker mitigation strategy is to be implemented, it is likely that the control mechanisms would only have to be applied to a turbine to bring the duration of shadow flicker down to the 28-minute post-mitigation shadow flicker target.		
MM68	Interference with Communications Systems and EMF	EIAR Chapter 5, 15	Interference with domestic transmitters can be overcome by the installation of deflectors or repeaters.		
Decommissioning Phase					
MM69	Decommissioning Phase	EIAR Chapter 5,4	The wind turbines proposed as part of the Prospective Development are expected to operate for a period of 25 years. Following the end of this period, the wind turbines may either operate for a further period or be replaced with a new set of turbines, subject to planning permission being obtained, or the Subject Development may be decommissioned fully. The Grid		

			Connection infrastructure will remain in place as it will form part of the national electricity grid under the control of EirGrid. The works required during the decommissioning phase are described in Section 4.11 in Chapter 4: Description of the Prospective Development. Any effect and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent, and the mitigation measures will be implemented during the decommissioning phase also. A Decommissioning Plan has been prepared as part of the EIAR and is included as Appendix 4-7. This Decommissioning Plan follows the most up to date NatureScot guidance. By its nature, the Decommissioning Plan is a working document and, in accordance with the NatureScot guidance, an updated decommissioning plan will be agreed with the local authorities three months prior to decommissioning the Subject Development.		
EIAR Chapter 6 Biodiversity					
Pre-construction					
MM70	Ecological Receptors	EIAR Chapter 6 Appendix 6-4	Given that mobile species may migrate into the Site over time, a pre commencement walkover survey will be undertaken to ensure that any faunal species that may migrate into the Site over time are appropriately considered during the construction phase, and any unforeseen impacts are adequately mitigated. Otter Whilst no otter breeding or resting places were recorded on the Site during the surveys undertaken, a pre commencement survey for otter will be undertaken in advance of construction to ensure that the species is treated appropriately, should it migrate into the Site. Invasive Alien Species Notwithstanding the above, a detailed IAS survey will be undertaken prior to commencement to update the surveys previously undertaken. This will identify any invasive alien species listed on the First Schedule of the S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024. The locations of any such species will be recorded and their locations		

			mapped. Should any be located within or adjacent to the footprint of the Prospective Development, the measures set out in the Invasive Species Management Plan (ISMP) that is included as Appendix 6-4 will be adhered to. In addition, this sets out site hygiene biosecurity measures that will be adhered to at all times.		
Construction Phase					
MM71	Erosion Associated with Aquatic Species	EIAR Chapter 6, 9	Measures to prevent significant effects on watercourses include but are not limited to; ➤ Avoidance of Watercourses (with the exception of one culvert replacement) ➤ Control of surface waters through construction areas in accordance with a detailed drainage plan (Appendix 4-4) ➤ Silt fences and bags ➤ Settlement ponds ➤ Level Spreaders and vegetation filters ➤ Timing of sensitive works to avoid periods of high rainfall ➤ Monitoring and maintenance plan – construction phase ➤ Tree felling in line with DAFM Guidance Documents ➤ Specific mitigations to control waters on the Site during felling operations ➤ Application of felling buffers around watercourse.		
Operational Phase					
MM72	Key Ecological Receptors	EIAR Chapter 6 Appendix 6-4	Whilst no significant effect on these KERs is predicted as a result of the operation of the Prospective Development, Mitigation is set out in Chapter 9 of the EIAR to avoid and minimise any operational impacts on a precautionary basis. These measures are fully described in the drainage plan and associated drawings that are provided in Appendix 4-3 to the EIAR.		
MM73	Blanket Bog Enhancement	Appendix 6-4	Block direct connection between the peatland habitat enhancement area and the watercourse to the north. Any collector artificial drains (interceptor drains) that provide connection to the watercourse will be blocked to prevent run off of suspended solids or other pollutants. These measures will take the form of peat dams where there is no flow (as is the case in the vast majority of drains/furrows) and check dams if any flowing drains are encountered. The		

			enhancement works will then commence upslope at the highest point and work systematically downslope towards the natural watercourse. Given the topography and small size of drains and furrows, it is likely that surface smoothing will be the main action undertaken. However, if it becomes apparent, following felling, that additional drain blocking is required.		
MM74	Soil Erosion	Appendix 6-4	The following supplementary mitigation measures will be employed during felling works. These will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses. They 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 parcels 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. ➤ 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 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. ➤ Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required. ➤ 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.		
MM75	Tree Felling and Brash Management	Appendix 6-4	➤ The felling of standing trees in harvest blocks will be undertaken by a timber harvesting machine. Extraction of the logs to the forest road will be carried out using a forwarder. ➤ Low ground pressure machinery will be used. ➤ These machines will traverse the parcel along specified routes ('racks'), over brash mats comprised of deposited branches, off-cuts from tree stems and tops of trees. This is to distribute machine weight and to provide further soil protection from compaction, rutting and erosion. As it fells trees and progresses into the harvest block, the harvester will collect the brash produced by the felling and delimbing of individual trees, and place it in front of the machine, in advance of it moving further forward along the rack. These brash mats will also be used by the forwarder, as it will stay on the racks as it traverses the parcel. Both machines may travel over the same section of the rack several times. Therefore, racks will be monitored and fresh brash will be gathered by the forwarder and applied to racks to ensure that they remain effective. ➤ The harvester machine will cut standing trees within the harvest block using a combined chainsaw and grapple (referred to as a 'harvester head') located at the end		

			of a hydraulic boom. This head fells each tree and then strips (or ‘delimbs’) the stem of branches. ➤ The merchantable timber will be crosscut into sawlog and pulpwood log products of various lengths from 1.6-5.5 m. ➤ These logs will be temporarily deposited on either side of the brash-protected rack from where the harvester will operate and over which, the harvester and the forwarder will travel as they traverse the harvest block. The racks will be generally parallel to each other throughout the harvest block, spaced so that the harvester can fell those trees within its reach on both sides. The location of racks will avoid any wet and potentially sensitive areas of the site, and machines will not travel within the aquatic or other exclusion zones of this harvest block. ➤ Felled timber along the racks will be subsequently collected by the forwarder, which uses a hydraulic grapple arm to load timber into a receiving bunk in its powered trailer. Once the bunk is full, the forwarder will traverse the site along a rack to a stacking bay located beside the forest road, where it will then offload the timber to form (or add to an existing) timber stack, for collection by the haulage truck. At no stage will the forwarder exceed its design capacity and traverse overloaded across the site. In areas of blanket bog enhancement, all timber and brash will be removed from site and stumps will be either flipped, mulched or tamped down to smooth the surface as described in the following sections. In the remaining areas for hen harrier habitat enhancement, stumps will be cut as close to the surface as possible, timber removed from site, and brash windrowed.		
MM76	Potential Effects on Bats	EIAR Chapter 6	Noise and lighting restrictions: Operational noise associated with the Prospective Development will primarily comprise noise generated by wind turbines and substation infrastructure (e.g. transformer hum and associated cooling systems). These sources generally operate outside the ultrasonic frequency range used by bats for echolocation and navigation. Lighting will be avoided wherever possible. Where artificial lighting is required during construction, directional lighting will be used to prevent light spill onto woodland edges, forestry margins and other linear features used by bats for commuting and foraging. This will		

			be achieved through the use of directional lighting accessories, such as hoods, cowls, louvers and shields, to direct light only to the intended area (Stone, 2013). During operation, as part of the Prospective Development, lighting will be designed to prevent upward and lateral light spill to minimise light trespass and avoid illumination of surrounding habitats. Lighting design will comply with the Institution of Lighting Professionals Guidance Note GN08/23 – <i>Bats and Artificial Lighting at Night</i> (ILP, 2023). In addition, the Applicant commits to the Dark Sky Ireland Lighting Recommendations, which require that lighting is used only where necessary, directed only to the area requiring illumination, minimised in intensity, and of an appropriate spectral composition, with warm white light sources (≤ 2700 K) used where feasible. Aviation lighting will be limited to that required for safety and regulatory compliance. Vegetation buffers around turbines In accordance with NatureScot (2021) and Northern Ireland Environment Agency (NIEA, 2021) guidance, a minimum buffer of 50 m will be maintained between turbine blade tips and habitat features used by bats, including treelines and woodland edges. A 50 m buffer between turbine blade tip and the nearest habitat feature has therefore been adopted, based on a turbine configuration (blade length 66.5 m; hub height 90 m; maximum tip height 156.5 m). Buffer distances were calculated using the Natural England / NatureScot methodology and have been incorporated into the turbine layout (Plate 6-1). The resulting vegetation-free buffer zones form part of the embedded design of the wind farm and will be maintained throughout the operational life of the wind farm as part of the Prospective Development. These buffers are a key component of the design approach to managing bat collision risk. Blade feathering Guidance from the Northern Ireland Environment Agency (NIEA, 2021) and NatureScot (2021) is adopted as best practice and recommends that, in addition to buffers applied to key habitat		
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			features, wind turbines implement blade feathering when wind speeds are below the cut-in speed of the turbine. Blade feathering will be implemented as a standard operational measure for the Prospective Development, with turbine blades feathered below the cut-in wind speed. This represents standard turbine operation and is expected to be implemented automatically through the turbine control system.		
EIAR Chapter 7 Birds					
Pre-Construction Phase					
MM77	Birds	EIAR Chapter 7 Appendix 7-8	➤ A pre-construction bird survey at the Wind Farm Site will be organised to ensure that any sensitive roost or nest sites in the works area are identified and disturbance to these are avoided. This will include surveys targeted towards hen harrier ➤ Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. This will include a dedicated breeding hen harrier survey		
Construction Phase					
MM78	Birds	EIAR Chapter 4, 6, 7, 9, 12 Appendix 3-4	➤ Construction works will not take place in the vicinity of the most recent hen harrier nest site until the forestry canopy closes at this location, to ensure no short-term loss of nesting habitat. ➤ Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). ➤ The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context. ➤ During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be		

			considered in relation to disturbance of birds. 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. ➤ Silt fences will be installed as an additional water protection measure around existing watercourses. ➤ 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 birds are no longer dependent on the roost/nest.		
Operational Phase					
MM79	Soil Erosion	Appendix 6-4	The following supplementary mitigation measures will be employed during felling works. These will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses. They 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 parcels 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. ➤ 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 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. ➤ Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required. ➤ 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.		
MM80	Tree Felling and Brash Management	Appendix 6-4	➤ The felling of standing trees in harvest blocks will be undertaken by a timber harvesting machine. Extraction of the logs to the forest road will be carried out using a forwarder. ➤ Low ground pressure machinery will be used. ➤ These machines will traverse the parcel along specified routes ('racks'), over brash mats comprised of deposited branches, off-cuts from tree stems and tops of trees. This is to distribute machine weight and to provide further soil protection from compaction, rutting and erosion. As it fells trees and progresses into the harvest block, the harvester will collect the brash produced by the felling and delimbing of individual trees, and place it in front of the machine, in advance of it moving further forward along the rack. These brash mats will also be used by the forwarder, as it will stay on the racks as it traverses the parcel. Both machines may travel over the same section of the rack		

			several times. Therefore, racks will be monitored and fresh brash will be gathered by the forwarder and applied to racks to ensure that they remain effective. ➤ The harvester machine will cut standing trees within the harvest block using a combined chainsaw and grapple (referred to as a 'harvester head') located at the end of a hydraulic boom. This head fells each tree and then strips (or 'delimbs') the stem of branches. ➤ The merchantable timber will be crosscut into sawlog and pulpwood log products of various lengths from 1.6-5.5 m. ➤ These logs will be temporarily deposited on either side of the brash-protected rack from where the harvester will operate and over which, the harvester and the forwarder will travel as they traverse the harvest block. The racks will be generally parallel to each other throughout the harvest block, spaced so that the harvester can fell those trees within its reach on both sides. The location of racks will avoid any wet and potentially sensitive areas of the site, and machines will not travel within the aquatic or other exclusion zones of this harvest block. ➤ Felled timber along the racks will be subsequently collected by the forwarder, which uses a hydraulic grapple arm to load timber into a receiving bunk in its powered trailer. Once the bunk is full, the forwarder will traverse the site along a rack to a stacking bay located beside the forest road, where it will then offload the timber to form (or add to an existing) timber stack, for collection by the haulage truck. At no stage will the forwarder exceed its design capacity and traverse overloaded across the site. In areas of blanket bog enhancement, all timber and brash will be removed from site and stumps will be either flipped, mulched or tamped down to smooth the surface as described in the following sections. In the remaining areas for hen harrier habitat enhancement, stumps will be cut as close to the surface as possible, timber removed from site, and brash windrowed.		
MM81	Hen Harrier Enhancement	Appendix 6-4	It is proposed to permanently remove ~108 hectares of forestry and to create more biodiverse upland habitats suitable for foraging hen harrier. This measure ensures the provision of high-quality replacement peatland habitat to offset the loss of onsite habitat through disturbance/displacement related avoidance. The actions required to achieve this are tree felling, furrow and drain blocking, and revegetation. Furrow and Drain Blocking		

			Drains/furrows will be blocked where they provide hydrological connection to downstream watercourse to prevent any negative effects on downstream watercourses as a result of felling works. These measures should be complete before large scale construction works (i.e., turbine erection) begins. Revegetation After tree felling and timber removal, revegetation will be allowed to occur. Revegetation should be underway before large scale construction works (i.e., turbine erection) begins. The progress of revegetation should be monitored by an ecologist using relevés. Creation of Patchy Scrub Areas of patchy willow and birch scrub will be allowed to revegetate naturally to provide structural diversity and maximise establishment success. Scrub may only be allowed to cover a maximum of 30% of the enhancement area in total. If scrub exceeds 30% coverage, it will be removed using a mulching head, as described in Section 4. If scrub cover is less than 10%, scrub patches will be planted using a mix of bare-root saplings and 2-3year old potted trees.		
Decommissioning Phase					
MM82	Ornithology	EIAR Chapter 7	A Bird Monitoring Programme with the objective of monitoring the ornithological community at the Wind Farm Site during decommissioning works has been prepared It includes for pre-commencement and decommissioning monitoring to identify sensitive nests or roosts in proximity to the works. This will include surveys suitable hen harrier habitat.		
EIAR Chapter 8 Land, Soils and Geology					
Construction Phase					
MM83	Felling	EIAR Chapter 8	All felling operations will be completed in line with the Forest Service's published policy and will be subject of a Limited Felling Licence (LFL). The Forest Service policy requires replacement or replanting on a hectare for hectare basis for the footprint of the infrastructure developments.		
MM84	Excavation and Disturbance of Peat and Subsoil	EIAR Chapter 4, 8	<u>Wind Farm Site</u> The following recommendations and best practice guidelines for the placement of peat and spoil in identified spoil management areas and in landscaping will be adhered to during the construction of the Prospective Development :		

		Appendix 4-2	➤ The placement of peat within the peat cell will require the use of long reach excavators; ➤ The surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat/spoil will be carried out as placement of peat within the peat cell progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat; ➤ The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up (where practicable) to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the placement areas. ➤ Supervision by the Project Geotechnical Engineer is required for the development of the peat cell.		
MM85	Wastewater Disposal	EIAR Chapter 4, 8 Appendix 4-2	➤ A self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works; ➤ Welfare facilities are also present at the existing onsite substation (constructed as part of the Existing Development). Wastewater is stored in an underground tank and is removed by a licenced contractor. These facilities will also be used during the construction of the Prospective Development; ➤ Water supply for the site offices and other sanitation will be brought to Wind Farm Site and removed after use, to be discharged at a suitable off-site treatment location; and, ➤ No water or wastewater will be sourced on the Wind Farm Site, nor discharged to the Wind Farm Site.		
MM86	Erosion of Exposed Subsoils and Peat	EIAR Chapter 8 Appendix 4-3	➤ Soil/subsoil removed from the excavation locations 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, brush 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. Brush mat renewal will take place when they become heavily used		

			and worn. Provision will be made for brush mats along all off-road routes, to protect the soil from compaction and rutting.		
MM87	Peat, Soils and Subsoils during Felling	EIAR Chapter 8 Appendix 4-3	➤ 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 Site along specified off-road routes (referred to as racks); ➤ Brush 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 brush 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 brush will be applied when the brush 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.		
MM88	Excavation of Proposed Borrow Pits	EIAR Chapter 8 Appendix 4-3	The following mitigation measures are prescribed in relation to the excavation and reinstatement of the borrow pits: ➤ Peat and overburden will be removed and stored within the void at the existing borrow pits; ➤ Slopes within the excavated rock formed around the perimeter of the borrow pits will be formed at stable inclinations to suit local in-situ rock conditions. Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance; ➤ The stability of the rock faces within the borrow pits will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term; ➤ Rock buttresses will be constructed within BP3, founded on in-situ rock to create individual cells. The cells will be opened in sequence and filled as needed;		

			➤ A rock buttress to form cells within the borrow pit will be required to ensure access for trucks and excavators. This will be formed by leaving in place an upstand of intact rock as the borrow pit excavation is progressed; ➤ Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. The contractor excavating the rock will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely; ➤ The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit.; ➤ Surface water and groundwater drainage controls will be implemented at the borrow pits ➤ The development of the borrow pit will be supervised by the Project Geotechnical.		
MM89	Peat Instability and Failure	EIAR Chapter 8 Appendix 4-3	The key mitigation with regard peat stability risk was the completion of robust, multidisciplinary site investigations which informed a comprehensive peat stability risk assessment. The peat stability analysis completed by FT was undertaken following the principles in the Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, 2nd Edition, Scottish Government, 2017). The PSA (FT, 2026) provides a number of mitigation/control measures to reduce the potential risk of peat failure, summarised below; Excessive loading of in-situ peat No construction of new floating roads is to be carried out at the Wind Farm Site, although some of the existing floating roads will be used for the completion of the Prospective Development following proof load testing of the roads. No loading of in-situ peat. The instability recorded on site in all cases can be contributed to various degrees to excessive placed construction loading onto the in-situ peat surface. Identifying body of weak peat in proximity to proposed works Confirmatory re-testing and assessment in zone of influence in advance of construction works. Further confirmatory re-testing to be completed immediately prior to works recommencing in each area of site to ensure no change in ground conditions. Accidental excessive loading of in-situ peat during construction		

			Site supervision and permit to work with respect to peat stability. All construction on site shall be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety. Identifying areas of potential weak peat in advance of works completion of works Monitoring of ground movement and constructed works. In order to monitor the performance of the constructed works within the peat areas, and any further construction works to be carried out, a series of monitoring points shall be established throughout the site. Proof testing of floating roads. Full-scale proof load tests to be carried out on existing floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road. Degradation of work due to inclement weather Restrictions on work during or after periods of heavy or sustained rainfall. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure. Construction of stabilising berm downslope Downslope of the junction between the spur road to T01 and T02/04 a berm will be constructed downslope of the existing floating road, due to the relatively low ODF values recorded when a crane load is applied. Berm designed in accordance with Eurocode 7 design requirements.		
MM90	Peat Stability	Appendix 4-2	Other mitigation measures regarding peat stability are including but not limited to; ➤ No construction of new floating roads is to be carried out, although some of the existing floating roads will be used to complete the Prospective Development works. Given the potential risk associated with floating road construction alternative methods of construction will be adopted and are detailed in the PSA. ➤ No loading of in-situ peat. ➤ Spoil Management – All excavated peat and spoil will be stored in designated locations such as the existing borrow pits (BP1 and BP2) and the proposed extension to BP3 or in the peat cell at T18. No material will be side cast on peat slopes for either temporary or permanent storage. ➤ Monitoring of ground movement and constructed works. ➤ Confirmatory testing and assessment in zone of influence in advance of construction works is to be completed.		

			➤ Site supervision and permit to work with respect to peat stability. All construction on site will be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety. Procedures will be put in place to clearly demonstrate how this has been achieved which are detailed in the PSA. ➤ Proof testing of floating roads. Full-scale proof load tests to be carried out on floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road. ➤ A berm will be constructed downslope of the T01/T01 junction which will involve the excavation of peat and the placement of rockfill. ➤ Construction and weather conditions. Restrictions on work during or after periods of heavy or sustained rainfall as recorded from weather station located on site, or from Met Eireann weather forecasts. ➤ Following periods of heavy intense rainfall, the site will be inspected prior to resumption of construction works by a competent person to ensure that all drainage is working, and critical areas with respect to stability are stable with no signs of ground movement.		
MM91	Construction of Roads within the BMEP Site	Appendix 4-2, Appendix 6-4	Construction of a section of floating track on the BMEP Site: (a) Any works will be subject to the mitigation measures given below, or any other such related requirements. (b) Confirmatory testing as per bullet (7) below will be undertaken along the route of the track prior to construction commencing, including inspection, peat probing and hand shear vane testing. (c) Full-scale proof load testing as per bullet (9) below will be undertaken following construction of the new floating track. No loading of in-situ peat (sidecasting): The remaining works on the Wind Farm Site and the BMEP Site will be carried out without placing of any arisings or loading on to the in-situ peat. Placing of any load particularly onto the downslope margin of any works within peat will be avoided. ➤ It is recommended that the tracking of construction machinery onto the in-situ peat is kept to a minimum and limited to the installation or maintenance of site drainage using appropriate low ground pressure plant. In the event that construction machinery has to track onto the in-situ peat then the peat shall be inspected and assessed by a		

			competent person to avoid excessive loading. If the competent person is in any doubt as to the suitability of the peat for tracking of machinery, no tracking of machines onto the peat should take place. ➤ The definition of excessive loading shall be determined by the competent person and will take into account the nature and type of loading and the nature and type of the in-situ peat and general ground conditions. ➤ Where required the assessment will include visual inspection and appropriate testing of in-situ peat with respect to depth and strength to full peat depth. For example, thin peaty soil (less than 0.5m thick) over mineral soil would not represent a notable risk of peat instability. The results of the assessment, pending satisfactory findings, shall be completed prior to any works commencing. A record of all such assessments shall be maintained. ➤ The above excludes areas of landscaping that will be required around hardstands and alongside roads, where peat will be used to 'dress' cut and fill slopes and areas of disturbed ground. Spoil Management; All excavated peat and spoil to be stored in appropriated designed locations, such as within the existing borrow pits (BP1 and 2) and the proposed extension to the borrow pit (BP3). No material will be sidecast on the peat slopes for either temporary or permanent storage (excluding landscaping requirements).		
MM92	Peat Stability	Appendix 4-2, 6-4	Procedures that provide an auditable chain of command shall be put in place to clearly demonstrate that peat stability and related health and safety have been assessed in the construction management. ➤ For any construction activity where peat stability and related health and safety have been assessed, then a permit to work shall be issued to the construction operative by the appropriate personnel. ➤ No construction works will be started until a permit to work has been issued to the construction operative by the appropriate personnel. Construction of berm downslope of T01/T04 Junction will involve the excavation of peat and placement of rockfill. ➤ Excavation of peat and immediate backfill with rockfill. ➤ The lateral extent of excavation will be limited to 3m (effective lateral reach of an excavator) before being backfilled. Rock fill from the on-site borrow pits will be		

			transported to the berm using A25 dumpers, with the coarse rock tipped onto the constructed section of berm before backfilling. Material will not be end-tipped into the excavation. ➤ No material will be side cast or stored on the peat surface during the construction of the berm. Where the sides of the peat are spalling or squeezing then the stability of the peat will be maintained by controlled displacement of the very weak peat with coarse rockfill and boulders pushed down onto the underlying glacial till to form a stable base ➤ Monitoring will be required both upslope and downslope of the berm during the construction works. ➤ A detailed method statement for these works will be prepared prior to construction commencing. ➤ Following periods of heavy intense rainfall, such as 10mm/hr, >25mm in a 24-hour period, or >50% of monthly average in a 7-day period and in following 24 hours, no groundworks may take place, and any ongoing works should be restricted to hardstanding areas. ○ When periods of heavy intense rainfall are predicted then works will be ceased in advance and any construction works in critical areas with respect to stability are secured in advance.		
Operational Phase					
MM93	Site Road Maintenance	EIAR Chapter 8	➤ Use of aggregate from authorised quarries for use in road and hardstand maintenance.		
MM94	Site Vehicle/Plant Use	EIAR Chapter 4, 8 Appendix 4-4	➤ Vehicles used during the operational phase will be refuelled off site before entering the Proposed Project site; ➤ It is not envisioned that fuels will be stored on-site during the operational phase; ➤ 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 Construction and Environmental Management Plan (CEMP) (see Appendix 4-3).		

		Appendix 4-5			
MM95	Use of Oil in Transformers	EIAR Chapter 4, 8 Appendix 4-4	➤ The electrical control building (at the substation) will be banded appropriately to the volume of All transformers in the turbines and substation areas will be banded 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 4-3).		
Decommissioning Phase					
MM96	Decommissioning Phase	EIAR Chapter 8	➤ The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of reduced magnitude. ➤ Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. ➤ Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
EIAR Chapter 9 Water					
Pre-Construction Phase					
MM97	Temporary Drainage Works	EIAR Chapter 4, 9 Appendix 4-4	Pre-commencement Temporary Drainage Works 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					
MM98	Watercourses	EIAR Chapter 9	Mitigation measures for the new proposed steel and timber footbridge crossing associated with the amenity proposals are detailed below: - The proposed crossing will comprise a clear-span steel and timber footbridge. No permanent structures will be located within the watercourse channel and the existing bed and banks will remain undisturbed; - All drainage and sediment-control measures will be installed prior to commencement of works in the vicinity of the watercourse; - Construction activities will be undertaken from the banks where practicable and no plant or machinery will enter the watercourse; - Plant and equipment will not be permitted to track across the channel; - Access to the opposite bank will be required that avoids disturbance of the bed and banks; - Any excavated material will be stored outside the watercourse buffer and protected from erosion. - Appropriate sediment-control measures, including silt fencing will be installed down-gradient of works areas. - Refuelling, plant maintenance and material storage will be undertaken in designated areas away from the watercourse. - Spill kits will be maintained on site and emergency response procedures implemented in the event of an accidental release. The following mitigation measures will be implemented with respect to upgrade of the crossing at T14 and the new box culvert: - In-stream works will be undertaken during low-flow conditions and during the time period as recommended by IFI;		

			➤ Where required, the works area will be isolated from the watercourse using over-pumping, fluming or other appropriate flow management measures; ➤ Temporary flow management measures will be monitored throughout the works to ensure uninterrupted downstream flow and to prevent scour, erosion or sediment mobilisation; ➤ Where the box culvert is installed in sections, the joint will be sealed to prevent granular material entering the watercourse; ➤ Sediment and erosion control measures will be installed prior to commencement of works and maintained throughout construction; ➤ Excavated material and stockpiles will be stored away from the watercourse and protected from runoff; ➤ Refuelling, plant maintenance, and chemical storage will be undertaken in designated areas away from the watercourse; ➤ Spill kits will be available on-site and all personnel will be trained in spill response procedures. ➤ Plant and machinery entering the site will be inspected to ensure they are free from leaks and in good working order; ➤ Concrete works will be managed to prevent cementitious material or wash water entering the watercourse; ➤ Disturbed channel banks and riparian areas will be reinstated and stabilised immediately following completion of works; ➤ Regular environmental inspections will be undertaken to ensure compliance with water quality protection measures; and, ➤ Any pollution incident will be reported and remedial action implemented immediately.		
MM99	Use of the 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 in-house 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).		
MM100	Surface Waters	EIAR Chapter 4, 9 Appendix 4-3 Appendix 4-4 Appendix 4-5	Mitigation by Avoidance The key mitigation measure to be implemented 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 Prospective Development is located outside of the delineated 50m natural watercourse (river and stream) buffer zones. Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the hydrological buffer zones. The silt fences will be installed as single, double or triple silt fences depending on the space available and the anticipated loading. Further details on silt fences are included in the CEMP (Appendix 4-3 of the EIAR). The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures to be properly installed and operate effectively. Mitigation by Design: The drainage measures associated with the Prospective Development are proportionate to the works that are intended in each area. The Prospective Development drainage replicates what works well from the Existing Development drainage layout i.e. use of interceptor/collector drains, silt fencing, silt traps, settlement ponds and routing treated drainage downstream via the existing forestry drainage network. ➤ 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 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 Prospective Development, an extensive network of forestry and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Prospective Development drainage system. 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.		
MM101	Tree Felling	EIAR Chapter 9	Tree felling operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment. ➤ Forestry Standards Manual (Forest Service, 2015) ➤ Forest Protection Guidelines (Forest Service, 2002) ➤ Forest Operations and Water Protection Guidelines (Coillte, 2013) ➤ Forestry and Water Quality Guidelines (Forest Service, 2000b) ➤ Forestry and the Landscape Guidelines (Forest Service, 2000c) ➤ Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018) ➤ Coillte Planting Guideline SOP ➤ Code of Best Forest Practice (Forest Service, 2000) <u>Mitigation by Avoidance:</u>		

			There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “Forestry and Water Quality Guidelines”. The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures to be properly installed and operate effectively. The buffer/setback zone will: ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. <u>Mitigation by Design:</u> 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		
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			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 on Site during construction; ➤ Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; ➤ Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; ➤ Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; ➤ Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.		
MM102	Groundwater Levels during Excavation Works	EIAR Chapter 9	The extraction of bedrock at the proposed borrow pits will follow the current international best practice. This protocol will be employed to mitigate the potential effects of explosives on groundwater quality during blasting operations.		
Operational Phase					

MM103	Release of Wastewater	EIAR Chapter 9	A sealed underground holding tank for effluent (wastewater) from the substation building has been installed. The tank shall be routinely emptied by a licensed contractor. A level sensor has been installed in the tank which shall be linked to the on-site SCADA system. If the level of the tank contents rise to a predetermined 'high' level a warning shall appear on the overall SCADA system for the wind farm and automatic notification shall be sent to the facility manager. A suitably permitted waste contractor will be engaged, in relation to the servicing and de-sludging of the wastewater holding tank on site. There will be no discharge of wastewater to ground at the Site, and therefore there is no potential to impact groundwater or surface water quality.		
Decommissioning Phase					
MM104	Decommissioning Phase	EIAR Chapter 9	The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works in comparison to construction phase works.		
EIAR Chapter 10 Air Quality					
Construction Phase					
MM105	Exhaust Emissions	EIAR Chapter 10 Appendix 4-4	➤ Prospective Development 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 will produce 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 to limit exhaust emissions from idling. ➤ Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. ➤ 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 wind farm infrastructure will be predominantly sourced onsite, and locally sourced if required, which will further reduce potential emissions. ➤ A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3).		
MM106	Exhaust Emissions: Transport to and from the Site	EIAR Chapter 10	➤ Aggregate materials for the construction of the wind farm infrastructure will be predominantly sourced onsite, and locally sourced if required, which will further reduce potential emissions. ➤ 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. ➤ Waste material will be transferred from the Site to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. ➤ A CEMP will be in place throughout the construction phase (see Appendix 4-3).		
Operational Phase					
MM107	Dust Emissions: Prospective Development Infrastructure	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 dust emissions that arise. ➤ 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.		

MM108	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 dust emissions that arise		
Decommissioning Phase					
MM109	Decommissioning Phase	EIAR Chapter 10	Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less effect. The mitigation measures prescribed for the construction phase of the Prospective Development will be implemented during the decommissioning phase thereby minimising any potential effects. The potential for effects during the decommissioning phase of the Prospective Development has been fully assessed within the EIAR.		
EIAR Chapter 11 Climate					
Construction Phase					
MM110	Greenhouse Gas Emissions	EIAR Chapter 11	➤ Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. ➤ All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. ➤ When stationary, delivery and on-site vehicles will be required to turn off engines. ➤ Turbines and construction materials will be transported to the 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 Prospective Development from the onsite borrow pits.		

			➤ Areas of excavation will be kept to a minimum, placement of material will be in designated peat and spoil management areas (i.e. the onsite borrow pits, and peat cell at T18). ➤ A Construction and Environmental Management Plan (CEMP) (Appendix 4-3) will be in place throughout the construction phase. ➤ The CEMP (Appendix 4-3) includes a Waste Management Plan (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 Prospective Development. Disposal of waste will be seen as a last resort. ○ Section 4.5.7 of Chapter 4 for the 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 Wind Farm Site to reduce the amount of emissions associated with vehicle movements. ➤ It is intended to obtain the majority of aggregate materials for the construction of the Prospective Development from the onsite borrow pits (with some material being imported from local licenced quarries as needed). This will significantly reduce the number of 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					
MM111	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.		
Decommissioning Phase					

MM112	Decommissioning Phase	EIAR Chapter 11	Any cumulative impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Prospective Development will be implemented during the decommissioning phase thereby minimising any potential cumulative effects.		
EIAR Chapter 12 Noise					
Construction Phase					
MM113	Construction Noise	EIAR Chapter 12	➤ 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; ➤ Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; ➤ Selection of plant with low inherent potential for generation of noise and/ or vibration where practical; ➤ Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and; ➤ 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. Where rock breaking is employed in relation to the proposed borrow pit locations or other locations across the Site, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities: ➤ Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency.		

			➤ Ensure all leaks in air lines are sealed. ➤ Use a dampened bit to eliminate ringing. Further guidance will be obtained from the recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 in relation to blasting operations. The methods used to minimise impacts will consist of the following. ➤ Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). ➤ The firing of blasts at similar times to reduce the ‘startle’ effect. ➤ On-going circulars informing people of the progress of the works. ➤ The implementation of an onsite documented complaints procedure. ➤ The use of independent monitoring for verification of results. ➤ Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.		
MM114	Wind Turbine Noise	EIAR Chapter 12	In the unlikely event that an issue with low frequency noise is associated with the Prospective Development, it is recommended that an appropriate detailed investigation be undertaken. Due consideration should be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document entitled ‘Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities ’ (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the Salford University document ‘Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011’.		
Operational Phase					
MM115	Operational Phase (Noise)	EIAR Chapter 12	In the unlikely event that an issue with low frequency noise is associated with the Prospective Development, it is recommended that an appropriate detailed investigation be undertaken. Due consideration should be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document entitled ‘Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities ’ (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the Salford University document ‘Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011’.		

MM15	Amplitude Modulation	EIAR Chapter 12	In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Subject Development, the operator will fully investigate the complaint in collaboration with the turbine manufacturer, through review of the meteorological periods and conditions during which the reported AM occurs. If an ongoing issue with excessive AM is identified, a mitigation strategy to reduce the level of AM will be implemented through engineering methods and/or curtailment of specific turbines. The operator may appoint a qualified acoustic consultant to objectively assess the level of AM in accordance with the methods outlined in the IOA AMWG or subsequent revisions		
Decommissioning Phase					
MM116	Decommissioning Phase (Noise)	Chapter 12 Appendix 4-6	No specific mitigation measures are required for decommissioning. To ameliorate any potential noise impacts that may present during the decommissioning phase, a schedule of noise control measures has been formulated in accordance with best practice guidance. These are outlined in the Decommissioning Plan (Appendix 4-6) that has been prepared for the Proposed Project.		
EIAR Chapter 13 Landscape and Visual					
Construction Phase					
MM117	Visual Effects	EIAR Chapter 13	In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible.		
MM118	Visual Effects	EIAR Chapter 13	General housekeeping measures, necessary for Health and Safety requirements, will ensure that the active construction areas will be kept tidy, mitigating localised visual impacts during the construction phase. A detailed description of the Prospective Development is included in Chapter 4 of the EIAR. The following sections assess the visual effects associated with the construction phase of the other (non-turbine) components of the Prospective Development.		

EIAR Chapter 14 Cultural Heritage					
Construction Phase					
MM119	Unrecorded Cultural Heritage Assets	EIAR Chapter 14 Appendix 4-3	➤ A buffer zone of 10m will be established around the potential Cultural Heritage feature within Parcel 2 prior to the commencement of clear-felling in this area. The buffer will comprise durable post-and-wire fencing with 'Keep Out' signage. ➤ A walk-over survey of the BMEP Site (both Parcels) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.		
MM120	Sub-surface Archaeology	EIAR Chapter 4 Appendix 4-3	➤ Archaeological monitoring under licence from the NMS of any further peat removal required as part of the construction stage of the Prospective Development will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ A walk-over survey of the BMEP Site (both Parcel 1 and Parcel 2) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.		

			➤ A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented.		
Operational Phase					
MM121	Landscape Effects	EIAR Chapter 14	➤ Archaeological monitoring under licence from the NMS of any further peat removal required as part of the construction stage of the Prospective Development will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ A walk-over survey of the BMEP Site (both Eastern and Western blocks) will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary. ➤ A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented.		
EIAR Chapter 15 Material Assets					
Material Assets - Traffic					

Construction Phase					
MM122	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 153 abnormal sized loads will be delivered to the Site, comprising 51 convoys of 3 vehicles, undertaken over 51 separate nights. ➤ These nights will be spread out over an approximate period of 11 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.		
MM123	General Traffic Management	EIAR Chapter 15 Appendix 15-2	The 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 Prospective Development. 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 Donegal County Council in advance of deliveries of turbine components to the Wind Farm 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 Wind Farm Site. ➤ Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. the delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number 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 Prospective Development 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. ➤ Liaison with the relevant local authority - Liaison with Donegal 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 minor alterations to road network at critical junctions – at locations highlighted in Section 15.1.8. ➤ Agreement of delivery routes – These routes will be agreed with Donegal 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. ➤ Traffic management on L6554 – Temporary traffic management measures including signage and flagmen on short section of L6554 during tree felling associated with the BMEP.		
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			➤ 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 4-3. ➤ Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
Decommissioning Phase					
MM124	Decommissioning Phase	EIAR Chapter 15 Appendix 4-6	In the event that the Prospective Development is decommissioned after the 25 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 of the EIAR and Appendix 4-6 Decommissioning Plan. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning, in accordance with Scottish Natural Heritage report (SNH) <i>Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms</i> (SNH, 2013).		
Material Assets - Other					
Construction Phase					
MM125	Electricity	EIAR Chapter 4, 15 Appendix 4-3	➤ 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 overhead lines 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 ➤ All staff will be made aware of and adhere to the Health & Safety Authority's <i>'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'</i>. This will encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan. ➤ Other Material Assets ➤ 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.		
MM126	Water	EIAR Chapter 9, 15	➤ 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.		
Operational Phase					
MM127	Telecommunications	EIAR Chapter 15 Appendix 15-4	In the event of interference occurring to telecommunications, the Guidelines (DoEHLG, 2006) acknowledge that '<i>electromagnetic interference can be overcome</i>' by the use of diverter 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 Agreement ensures that in the event of any interference occurring to television or radio reception due to operation of the Prospective Development, the required measures, as set out in the Protocol Agreement, will be carried out by the Applicant to rectify this. The Protocol Agreement 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 Prospective Development. As outlined above, it is expected that the Enet link that would be impacted by the Wind Farm Site will be decommissioned within the next two years and should therefore not be impacted by the operation of the Prospective Development. Notwithstanding, the proposed 80m onsite met mast has been positioned to allow the link to be rerouted, if necessary, and without being impacted by any other proposed turbines. This provides a suitable mitigation measure in the event that the Enet link remains active when the Prospective Development becomes operational.		
MM128	Aviation	EIAR Chapter 15	The following IAA and DoD requests will be complied with should the Proposed Project be consented. DOD requests: <u>Irish Aviation Authority</u> 1. Agree an aeronautical obstacle warning light scheme for the wind farm development;		

			2. Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location; and 3. Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection. <u>Department of Defence</u> 1. 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. 2. 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. 3. Light intensity to be of similar value to that emitted in the visible spectrum of light.		
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8. MONITORING PROPOSALS

All monitoring proposals relating to the pre-commencement, construction and operational phases of the Prospective Development are set out in various sections of the EIAR, NIS and Biodiversity Enhancement Plan prepared as part of the planning application to Donegal 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 Prospective Development. 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 Appendix 4-4	Reactive Site Drainage Management The final drainage design prepared for the Prospective Development 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. An inspection and maintenance plan for the drainage system on-site will be prepared in advance of commencement of any works on the Prospective Development. Regular inspections of all installed	Ongoing	Monthly	EnvCoW / Project Hydrologist

			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.			
MX2	Felling Operations		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 Sampling Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The	Ongoing	Daily	Project Hydrologist/ Project Ecologist

			‘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.			
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MX3	Peat Stability		Confirmatory testing and assessment in zone of influence in advance of construction works is to be completed. The peat stability assessment within this report and the Ionic report have concluded that the Wind Farm Site and BMEP are safe and the remaining works can be completed safely in accordance with the recommendations and mitigation measures contained herein. Notwithstanding, the following confirmation testing and assessment will be carried out immediately in advance of construction. The confirmation testing and assessment is in addition to that already carried out in the peat stability assessment. ○ In advance of the construction of any remaining works, a zone of influence extending 50m minimum in all directions from the proposed works area will be re-inspected and assessed by a competent person in advance of any works. ○ Where deemed necessary by the competent person, the zone of influence will be extended to include any ground that is considered to be affected by the works. ○ The assessment within the zone of influence will include visual inspection and appropriate testing of in-situ peat with respect to depth and strength to full peat depth. The assessment will include but not be limited to recording morphology, vegetation cover, drainage, proximity of drains and natural watercourses. The results of the assessment will be considered by the designer. ○ The further confirmatory testing of in-situ peat with respect to depth and strength to full peat depth will comprise the following within the zone of influence and will be carried out immediately in advance of works commencing:	Ongoing	Pre-Construction	Project Geotechnical Engineer
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			○ Peat depth determined at typically at 20m spacing using peat probes or alternatively using continuous depth profiling such as ground penetrating radar (GPR). ○ In-situ shear vane testing, or similar technique that measures the operational shear strength of the peat, typically at 20m spacing depending on the encountered peat condition. Testing also to be undertaken below the sections of floating road to be used as part of the Prospective Development. The use of the Geonor H10 field vane is recommended for this. ○ Spacing of probes and in-situ shear vane testing, or similar, to be reduced where areas of deeper peat are encountered. ○ A hydrological assessment carried out by appropriate experienced and competent person, which will include but not be limited to drainage, proximity of drains and natural watercourses will be carried out in advance of construction works. ○ The results of the assessment, pending satisfactory findings, will be completed prior to any works commencing. Works will only commence following a permit to work being issued. ○ A record of all such assessments will be maintained. ○ Site supervision and permit to work with respect to peat stability. All construction on the Wind Farm Site will be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety. Procedures will be put in place to clearly demonstrate how this has been achieved, for example: ○ All works that may affect the stability of the Wind Farm Site will be routinely inspected and supervised on Wind			
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			Farm Site by appropriate personnel. Regular geotechnical inspection of the works associated with the Prospective Development will be undertaken by a suitably experienced geotechnical engineer. ○ The above procedure will be independently audited by a suitably competent and experienced person(s). The competent person shall have suitable professional qualifications and have experience of carrying out similar roles for construction projects in peatland. ○ All persons involved in the assessment of peat stability on the Wind Farm Site will have sufficient expertise, competency, and experience for the tasks to which they have been assigned. ○ Proof testing of floating roads. Full-scale proof load tests to be carried out on floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road. A suggested outline methodology is given below. ○ Rolling load test for all floating roads. Tests to be carried out using a fully laden dump truck with sufficient load to mimic the load of the mobile crane. The weight of any truck should be recorded at a weighbridge. Typical test procedure as follows: ○ Condition and deflection of the floating road observed visually as the truck travels continuously over the floating road at a constant low speed. ○ The performance of the floating road will be qualitatively classified as Good, Fair or Poor based on the condition of the road and the observed deflection under the weight of the truck. ○ The results of the proof testing shall be analysed by the designer and any mitigation measures, which may include replacement with founded road on competent			
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			strata, to be incorporated into the design. All tests will be carried out under controlled conditions to ensure that the road is not adversely damaged and that instability does not occur. ➤ Excavation works will be monitored by the Project Geotechnical Engineer. ➤ Construction and weather conditions. Restrictions on work during or after periods of heavy or sustained rainfall as recorded from weather station located on the Wind Farm Site, or from Met Eireann weather forecasts. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure. ➤ Following periods of heavy intense rainfall, the Wind Farm Site will be inspected prior to resumption of construction works by a competent person to ensure that all drainage is working, and critical areas with respect to stability are stable with no signs of ground movement			
MX4	Otter	EIAR Chapter 6 Appendix 4-3	Whilst no otter breeding or resting places were recorded on the Site during the surveys undertaken, a pre commencement survey for otter will be undertaken in advance of construction to ensure that the species is treated appropriately, should it migrate into the Site.	Once	As required	Project Ecologist
MX5	Invasive Species	EIAR Chapter 6 Appendix 4-3	A pre-commencement invasive species survey of the construction footprint will be undertaken by a qualified ecologist to determine if any invasive species have established on the site since the undertaking of the previous surveys. The treatment and control of invasive alien species if recorded will follow guidelines issued by the National Roads Authority – The Management of The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020).	Once	As required	Project Ecologist
Construction Phase						

MX6	Drainage Management	EIAR Chapter 4, 9 Appendix 4-3, 4-4	Drainage swales will be regularly inspected for evidence of erosion along the length of the swale. If any evidence of erosion is detected, additional check dams will be installed to limit the velocity of flow in the channel and reduce the likelihood of erosion occurring in the future. Silt traps will be inspected weekly during the construction phase of the Prospective Development and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows. The frequency of drainage system inspections will be reduced following completion of the construction phase of the Prospective Development. 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.	Ongoing	Weekly	Project Hydrologist
MX7	Reactive Site Drainage Management	EIAR Chapter 4, 9	All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.	As required	As Necessary	EnvCoW / Project Hydrologist
MX8	Reactive Site Drainage Management	EIAR Chapter 4, 9	Check dams will be inspected and maintained regularly to insure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.	Daily	As Necessary	EnvCoW / Project Hydrologist
MX9	Reactive Site Drainage Management	EIAR Chapter 4, 9	Piped slope drains will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and blockages. Stake anchors or fill over the pipe will be checked for settlement, cracking, and stability. Any seepage holes where pipe	Ongoing	Weekly	EnvCoW / Project Hydrologist

			emerges from the drain at the top of the pipe will be repaired promptly.			
MX10	Reactive Site Drainage Management	EIAR Chapter 4, 9	Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.	Ongoing	Weekly	EnvCoW / Project Hydrologist
MX11	Waste Management	EIAR Chapter 4 Appendix 4-3	The Waste Management Act requires that any waste related activity must 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 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.	As Required	Weekly	Waste Manager
MX12	Borrow Pit	EIAR Chapter 4, 8	➤ The stability of the rock faces within the borrow pits will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines. ➤ It will be necessary to construct rock buttresses founded on in-situ rock within BP3 to create individual cells (up to 3 no. as required). The cells will be opened in sequence and filled as needed. The rock buttress will be constructed of rock fill from the borrow pit excavation, placed and compacted in layers. The founding stratum for the buttress will be intact bedrock and will be inspected and approved by the Project Geotechnical Engineer. ➤ Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit.	As Required	Monthly	EnvCoW, Project Geotechnical Engineer.

			➤ All the above-mentioned requirements will be implemented by the Contractor during construction			
MX13	Peat Stability	EIAR Chapter 4 Appendix 6-4	Monitoring of ground movement and constructed works; In order to monitor the performance of the constructed works within the peat areas, and any further construction works to be carried out, a series of monitoring points shall be established throughout the Wind Farm Site. ➤ Monitoring is proposed to provide advance warning of potential instability or possible longer-term movement, that may represent potential for degradation of the works over time that could lead to instability. ➤ The exact location of the monitoring will be determined following inspection. Other locations may be included as required by the designer or contractor. ➤ Monitoring will consist of a series of wooden posts (say 4 no.) inserted into the ground to create a straight line, ideally obliquely across the slope. A string line will be tied to the first and last post. The line of posts will be placed such that they can be sighted along from the position of the road. Any deviation of the posts would indicate potential movement of the peat. ➤ The monitoring is intended to be easy to install, readily read without any equipment, and where required can be readily maintained and replaced. ➤ The monitoring locations will be read weekly or following heavy rainfall. Readings will be carried out until completion of the works. ➤ A record of the readings shall be maintained. The record will include time, date, movement of any posts (or no movement), any follow-up inspections. Accidental movement of the posts will be noted and the posts moved back into alignment, where possible.	Ongoing	As Required	Project Geotechnical Engineer

			➤ Trigger levels will be taken as indicatively 100mm or continued rate of creep movement, as determined by the designer. Where trigger levels have been reached, the designer will be notified and the reason for the movement established to determine whether the movement warrants further investigation. ➤ Where there are remaining works to be completed then monitoring will be installed adjacent to the works at critical locations. Operatives will be made aware of the monitoring and will be required to observe the monitoring at a regular interval and to report any unusual observations to the construction management team. ➤ Where monitoring shows ground movement has occurred in an area where construction works is underway then works will cease in that area and operatives and plant moved to a safe location, the designer notified and the reason for the movement established prior to re-commencing works. Inspection of constructed works indicated a number of locations where monitoring is required.			
MX14	Rainfall Forecasting and Monitoring	EIAR Chapter 9, 10, 11 Appendix 4-3	The following forecasting systems are available and at least one of the following 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 informative than general forecasts as only available on a provincial scale;	As Required	Daily	EnvCoW

			➤ 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.			
MX15	Rainfall Forecasting and Monitoring	EIAR Chapter 9, 10, 11 Appendix 4-3	➤ 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,	As Required	Daily	EnvCoW

			○ 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 which will be maintained on-site during the construction phase. ➤			
MX16	Water Quality	EIAR Chapter 9, 10, 11 Appendix 4-3	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;	As required	Monthly	EnvCoW

			➤ 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.			
MX17	Drainage Monitoring	EIAR Chapter 4, 9	All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.	As required	As required	Project Ecologist
MX18	Ornithology	EIAR Chapter 7 Appendix 7-7	A Bird Monitoring Programme with the objective of monitoring the ornithological community at the Wind Farm Site during construction works has been prepared. It includes for pre-commencement and construction monitoring to identify sensitive nests or roosts in proximity to the works. This will include surveys in suitable hen harrier habitat.	Ongoing	Annually	Project Ornithologist
Operational Phase						
MX19	Maintenance	EIAR Chapter 4 Appendix 4-3	Each turbine will be subject to a routine maintenance programme involving several checks and changing of consumables, including oil changes. In addition, there is often a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic	Monthly	Monthly	ECoW

			will consist of four-wheel drive vehicles or vans. The site roads will also require periodic maintenance. Maintenance of the site roads will involve filling potholes and maintaining road edge markers. Drainage maintenance will typically involve cleaning of drainage ditches when required to prevent water backing up. The onsite 110kV substation and site tracks will also require periodic maintenance. The onsite 110kV substation is operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. 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. The following maintenance procedures will also be adhered. 1. Periodic service and maintenance works which include some vehicle movement. 2. For operational and inspection purposes, substation access is required. 3. Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: > Six-month service – three-week visit > Annual service – six-week visit > Weekly visits as required. Occasional technical problems may require maintenance visits by technical staff. During the six-month and annual service visits, some waste (lubricating and cooling oils, packaging from spare parts or equipment, unused paint, etc.) will arise. This will be recorded and removed from the Site and reused, recycled or disposed of in accordance with the relevant legislation in an authorised facility. It is estimated that 1-2 daily visits will be made to the Wind Farm Site for authorised persons and vehicles to undertake minor routine			
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			maintenance and inspection, if and when required. Although the level of activity required for the maintenance of the both the Wind Farm Site and existing Grid Connection infrastructure is minimal.			
MX20	Bats	EIAR Chapter 6 Appendix 6-1	➤ Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase. ➤ 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. ➤ Post-construction linear habitat restoration monitoring following the main growing season (i.e. in September) in a given year for the first five years of growth. ➤ Post turbine commissioning noise monitoring will be commenced within 6 months of commissioning the wind farm.	Ongoing	Monthly	Project Ecologist
MX21	Operational Phase Drainage	Appendix 4-3	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.	Ongoing	Weekly	Project Hydrologist. ECoW
MX22	Operational Monitoring Bats	EIAR Chapter 7 Appendix 6-1 Appendix 7-6	In accordance with NatureScot (2021), a minimum of three years of post-construction bat monitoring is proposed for the Prospective Development. The objectives of post-construction monitoring are to verify pre-construction risk predictions, assess any changes in bat activity patterns following construction, and determine whether further mitigation measures are required to avoid significant effects on bats. Post-construction monitoring will comprise a combination of: ➤ static acoustic monitoring; ➤ manual activity surveys (walked transects); and ➤ carcass searches to record any bat fatalities associated with turbine operation.	Ongoing	Annually	Project Ornithologist

			The results of post-construction monitoring will be used to review the effectiveness of the mitigation strategy. Where monitoring identifies evidence of significant bat mortality, an adaptive mitigation response will be implemented, which may include the introduction or refinement of turbine curtailment measures during periods of elevated collision risk, informed by key activity periods and weather parameters. Any such measures will be developed in line with relevant guidance and reviewed annually. At the end of each monitoring year, the efficacy of the monitoring and mitigation programme will be reviewed, and any identified refinements incorporated into subsequent monitoring years. This adaptive approach allows for an evidence-based assessment of post-construction bat risk and ensures that mitigation measures remain proportionate, effective and responsive to site-specific conditions. The effectiveness of any curtailment measures will be assessed to determine both: (a) whether bat mortality remains incidental; and (b) whether turbine downtime can be minimised while maintaining effective protection for bats. <u>Monitoring Year 1</u> <u>Bat activity surveys</u> Post-construction bat activity surveys will be undertaken using a comparable survey effort and methodology to the baseline surveys. Static acoustic monitoring will be undertaken during the main bat activity season (April to October), in accordance with NatureScot (2021). Full-spectrum bat detectors will be deployed at turbine locations for a duration and density consistent with the baseline bat surveys.			
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			Bat activity data will be processed and analysed using the same site-specific analytical framework applied to the baseline surveys, including calculation of bat passes per hour (bpph) and assessment of median and maximum nightly activity levels. This ensures direct comparability between pre-operational and post-operational datasets. Walked transect surveys will also be undertaken to provide supplementary information on bat behaviour across the landscape. Key environmental parameters known to influence bat activity and collision risk will be recorded and reviewed alongside activity data, including: ➤ wind speed (m/s), measured at nacelle height; ➤ ambient temperature (°C); and ➤ precipitation (mm/hr). <i>Carcass searches</i> Carcass searches will be undertaken at each turbine in accordance with NatureScot (2021) guidance to record bat fatalities associated with turbine operation. Surveys will incorporate: ➤ systematic search protocols; ➤ searcher efficiency trials; and ➤ scavenger removal trials, to allow appropriate correction factors to be applied when estimating true mortality rates. Surveys will be undertaken across relevant activity seasons, with a trained dog detection team utilised to maximise detection efficiency. <u>Monitoring Years 2 & 3</u> Monitoring will continue during Years 2 and 3, with survey methods and effort refined based on the findings of the preceding year(s). Where curtailment measures have been implemented, monitoring			
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			will assess the effectiveness of these measures relative to baseline conditions and earlier post-operational results. The performance of any curtailment strategy will be evaluated in relation to bat activity levels, wind speed and temperature thresholds, to confirm that mitigation is neither under- nor over-curtailing turbines during periods of bat activity. Annual reviews will determine whether modifications to the mitigation or monitoring programme are required. Where no bat fatalities are recorded during Year 1, the scope of curtailment (where applicable) may be reduced, revised or removed in subsequent years, subject to agreement with the relevant consenting authority and continued monitoring to confirm outcomes.			
MX23	Management of Woodland and Scrub	Appendix 6-4	➤ To prevent colonisation by tree and scrub species, Parcel 1 and Parcel 2 will be monitored annually for the first 5 years. The area covered by scrub, woodland and the windrowed material will be between 10% and 30% of the total area. Woodland and scrub retained on the site will be located in a mosaic throughout the site and not in one big block. ➤ To prevent the colonisation of the blanket bog habitat enhancement area by tree species, the area will be monitored for all seedling regeneration and the regeneration will be removed annually for the first 5 years. ➤ The frequency of maintenance and monitoring will be reviewed after 5 years and can be reduced if there is little ongoing colonisation. The colonisation will not be allowed to compromise status of the hen harrier habitat or the blanket bog habitat and the monitoring frequency will ensure that this does not happen. The period between monitoring visits and associated maintenance will not exceed 5 years. Where scrub and trees need removing, this	Ongoing	Annually	Project Ecologist

			will likely be undertaken using a machine with a mulching head.			
MX24	Monitoring of Habitat Suitability for Hen Harrier	Appendix 6-4, 7-7	To ensure that Parcel 1 and Parcel 2 provide suitable foraging habitat for hen harrier, the structure will be monitored annually for the first 5 years post initial enhancement works. The frequency of monitoring will be reviewed at this stage and can be reduced if the habitat is in a suitable structure and condition.	Ongoing	Month	Project Ornithologist
MX25	Monitoring for Hen Harrier Activity	Appendix 6-4, 7-7	To provide information on hen harrier activity in the BMEP Site, Parcel 1 and Parcel 2 will be monitored annually for the first 5 years to understand short-term use, as well as on Year 10 and 15, to understand long-term use. In brief, monitoring will include monthly field surveys in Parcel 1 and Parcel 2. The results will be presented during reporting for the Bird Monitoring Programme.	Ongoing	Annually	Project Ornithologist
MX26	Monitoring Blanket Bog	Appendix 6-4	High level monitoring assessments will be carried out within the target area for the first 5 years post initial enhancement works. These will serve to identify if the enhancement works are progressing as planned, in the potential absence of positive habitat condition assessments, which may take some years to establish. Ten 4x4m parcels will be established within the target area, within which the following metrics will be recorded: > Water levels. > Cover of non-native species. > Presence of sphagnum or other indicator species (yes or no). > Bare peat cover.	Ongoing	Annually	Project Ecologist
MX27	Breeding Walkover Surveys	Appendix 7-7	Breeding Walkover Surveys are proposed to monitor species that were recorded breeding within proximity to or within the Wind Farm Site during surveys from September 2023 to September 2025 and	Ongoing	Annually	Project Ornithologist

			their response to the operating wind farm. In particular, these include grey wagtail, kestrel, meadow pipit, snipe, buzzard, long-eared owl and sparrowhawk. Surveys are proposed during operational Years 1, 2, 3, 5, 10 and 15 of the operational lifetime. Survey methodology should be adapted from Brown and Shepherd methodology (Brown and Shepherd, 1993; Calladine <i>et al.</i>, 2009). One visit should be conducted each month from April to July inclusive to all areas within a 500m radius of the development footprint. The surveyor should record and map all target species (species listed on Annex I of the EU Birds Directive or red-listed for breeding populations on the Birds of Conservation Concern in Ireland list). A list of non-target species encountered should also be recorded to inform supporting habitat.			
MX28	Collision Monitoring Surveys	Appendix 7-7	Carcass searches for bird casualties as a result of collision with turbines will follow survey methods broadly based on guidelines issued by the SNH (2009) and search methods adopted by Duffy and Steward (2008) and any revisions to the same. The study area will be visited once per month during operational Years 1, 2, 3, 5, 10 and 15 of the operational lifetime. During each visit, the base of each of the 19 turbines will be searched for bird carcasses. The area to be searched will be based on the turbine size and surrounding landscape. A trained dog and handler should be used to locate carcasses. If a bird carcass is found, the following details will be recorded: GPS location of each bird carcass, photographic record, carcass condition (intact - carcass that is completely intact or not badly composed; scavenged - evidence that the carcass was fed upon by a scavenger/predator; or feather spot - ten or more feathers indicating predation or scavenging or two or more primary feathers must be	Ongoing	Annually	Project Ornithologist

			present to consider the carcass a casualty), distance from the turbine, date and time. Carcass removal trials and searcher efficiency trials will be undertaken to account for the ability of the dog to find bird carcass and the likelihood of scavenging of carcass by animals. This is done to ensure a more accurate estimation of the total number of collision victims. The result of these trials is a correction factor that can be applied to the results of the carcass searches.			
MX29	BMEP Site Auditing	Appendix 6-4	The BMEP will be audited each year. The audit will assess: ➤ Objectives of the plan. ➤ Implementation of the plan. ➤ Adherence to the requirements of the plan. The BMEP will be reviewed annually and as previously outlined, any requirement for amendments will be submitted to the planning authority.	Ongoing	Annually	Project Ornithologist
MX30	Vantage Point Surveys	EIAR Chapter 7	Vantage Point Surveys are proposed to monitor bird flight activity at the Wind Farm Site. This will provide information on bird responses to the operating wind farm as well as providing context to any carcasses found during Collision Monitoring Surveys. Surveys should be conducted at the same vantage point locations used during pre-planning surveys (VP1-VP6) to provide comparable data. Methodology should follow NatureScot (2025) or any revisions to the same. The surveyor should conduct a 6 hour survey (including a 30 minute break after 3 hours) at each vantage point once per month. The surveyor should record and map all target species (species listed on Annex I of the EU Birds Directive or red-listed for	Ongoing	Annually	Project Ornithologist

			breeding populations on the Birds of Conservation Concern in Ireland list). A list of non-target species encountered should also be recorded to inform supporting habitat.			
MX31	Breeding Red-throated Diver Surveys	EIAR Chapter 7	Field surveys showed that red-throated diver may be breeding in Lough Golagh and Lough Slug, and birds also travel to Loughnaweelagh. Although the Wind Farm Site was considered to be of No Ecological Importance to this species, given that red-throated diver are a rare breeding bird with a breeding range restricted to County Donegal, this presents an exclusive opportunity to monitor the local red-throated diver population in County Donegal in an area where there are wind energy developments. Therefore, it is proposed to conduct breeding season surveys at Lough Golagh and Lough Slug during operational Years 1, 2, 3, 5, 10 and 15 of the operational lifetime. Survey methodology should follow Gilbert <i>et al.</i> (1998) or any revisions to the same. Surveys should be conducted once at the end of May/June and once in July (leaving 14 days between visits). The surveyor should select a vantage point over looking the lough. Surveys should be conducted for 6 hours (with a 30 minute break after 3 hours) and should be during daylight. Red-throated diver, foraging flights and signs of nesting should be recorded and mapped.	Ongoing	Annually	Project Ornithologist
MX32	Earthworks	EIAR Chapter 4, 9	An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling.	Ongoing	Annually	Project Ecologist

			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. Checks will be carried out on a daily basis. During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards (EQSs) will be undertaken for each primary watercourse, and specifically following heavy rainfall events (as per the CEMP included in Appendix 4-3 of the EIAR).			
MX33	Noise and Vibration	EIAR Chapter 12 Appendix 12-6	Prior to the commissioning of the proposed turbines, the Applicant will submit a Noise Compliance Monitoring Protocol (NCMP) to the planning authority for written agreement and approval. The NCMP will include detailed methodologies for noise measurements, procedures for recording results, and a protocol for managing complaints in accordance with the most up to date guidance, standards, and industry best practice. It is a standard procedure for this to be agreed under the planning condition compliance framework. The proposed noise limits shall be cumulative, accounting for all operational wind turbines. When setting appropriate turbine noise limits in accordance with the criteria following the applicable WEDG06 guidelines and best practice guidance, it is important to bear in mind that where an existing wind turbine development is the dominant source of turbine noise at a given NSL, this must be considered in the context of the planning condition for noise under which other development operate. The proposed turbine noise criteria should apply to the nearest NSLs where it can be reasonably determined that the noise contribution	Once within six months	As Required	Noise Consultant

			from the operation of the proposed turbines is the dominant wind turbine source or has a significant contribution to the cumulative turbine noise level at a given NSL. The proposed operational noise limits for the proposed turbines at are: Noise levels generated by the windfarm following commissioning by itself or in combination with other existing or permitted wind energy development in the vicinity when measured externally at noise sensitive locations, shall not exceed: ➤ 40 dB $L_{A90,10min}$ for daytime in quiet environments with typical background noise of less than 30 dB $L_{A90,10min}$. ➤ 45 dB $L_{A90,10min}$ for daytime in environments with typical background noise greater than or equal to 30 dB $L_{A90,10min}$ or a maximum increase of 5 dB(A) above background noise (whichever is the higher); and ➤ 43 dB $L_{A90,10min}$ for night-time periods or a maximum increase of 5 dB(A) above background noise (whichever is the higher). Prior to the commissioning of the wind farm, the developer shall submit a Noise Compliance Monitoring Programme (NCMP) to the planning authority for written agreement. The NCMP shall include a detailed methodology for all noise measurements, (which is usually monitored within the first 6 months of turbine operation) and procedures for recording results. Noise Complaint Management Protocol In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Subject Development, the operator will fully investigate the complaint in collaboration with the turbine manufacturer, through review of the meteorological periods and conditions during which the reported			
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			AM occurs. If an ongoing issue with excessive AM is identified, a mitigation strategy to reduce the level of AM will be implemented through engineering methods and/or curtailment of specific turbines. The operator may appoint a qualified acoustic consultant to objectively assess the level of AM in accordance with the methods outlined in the IOA AMWG or subsequent revisions.			
MX34	Peat and Spoil Management / Instability	Appendix 4-3 Appendix 8-1	To monitor possible peat movements following the construction of the Prospective Development, it is recommended that the Wind Farm Site is inspected by a suitably qualified engineer annually for the first three years following commissioning of the Prospective Development. Particular attention should be given to the floating roads, as well to any areas where the site drainage is not functioning as intended. Excessive Movement Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the Wind Farm Site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following will be carried out. All activities (if any) will cease within the affected area. Increased monitoring at the location will be carried out. The area will be monitored until such time as movements have ceased. Re-commencement of activities will only start following a cessation of movement and agreement with all parties (Contractor/Engineer/Designer). Onset of Peat Slide In the unlikely event where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following will be carried out. On alert of a peat slide incident, all activities (if any) in the area will cease and all available resources will be diverted to assist in the required mitigation procedures. Action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain, the	As required	Every 6 Months	Geotechnical Engineer

			possible short run-out length to watercourses, speed of movement and the inability to predict locations it may not be possible to implement any on land prevention measures, in this case a watercourse check barrage will be implemented. All relevant authorities (such as Donegal County Council) will be notified if a peat slide event occurs on the Wind Farm Site. For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased. Check Barrages Whilst it is not anticipated based on the analysis undertaken that a peat slide will occur on Wind Farm Site. The check barrage procedure deals with preventing a peat slide from moving downstream within a watercourse. The most effective method of preventing excessive peat slide debris from travelling downstream in a watercourse is the use of a check barrage. A check barrage comprises the placement of rock fill across a watercourse. The check barrage is a highly permeable construction that will allow the passage of water but will prevent peat debris from passing through. Rock fill will comprise well-graded coarse rock pieces from about 200mm up to typically 5000mm.			
Decommissioning Phase						
MX35	Bird Monitoring	Appendix 7-7	It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement surveys will be undertaken within one month prior to the initiation of	Ongoing	Annually	Project Ornithologist

			works at the Wind Farm Site. The surveys will aim to identify sensitive sites (e.g., nests or roosts) in proximity to works. During construction, surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). As above, these surveys will aim to identify sensitive sites for birds in proximity to works. Any requirement for construction works to run into subsequent breeding or winter seasons following the commencement of works will be subject to a repeat of the pre-construction bird surveys. Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas. Suitable hen harrier habitat will be visited, particularly in areas where hen harrier were previously recorded nesting during pre-planning or operational phase surveys. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase no works shall be undertaken, works will cease within a species-specific buffer of this location in line with best practice guidance (Forestry Commission Scotland, 2006; NatureScot, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost or 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 off to alert all personnel on site to the suspension of works within that area.			
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9. PROGRAMME OF WORKS

9.1 Construction Schedule

The construction phase will take approximately 12 months to complete from starting on site to the export of electricity from site. Please note, the onsite 110kV substation and Grid Connection are currently operational, however the 33kV internal site electrical underground cabling has yet to be fully connected to the onsite substation and commissioned.

The EIAR stipulates that in the interest of breeding birds, construction will not commence during the bird nesting season, which runs from 1st of March to 31st of August inclusive. Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. This will include a dedicated breeding hen harrier survey (further details are provided in Appendix 7-8 of the EIAR).

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			
ID	Task Name	Q1	Q2	Q3	Q4
1	Site Health and Safety				
2	Site Compound Extension				
3	Site Roads – New and Upgrades				
4	Electrical Works incl. connection to substation				
5	Turbine Hardstands				
6	Turbine Foundations				
7	Backfilling and Landscaping				
8	Turbine Delivery and Erection				
9	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 Prospective Development 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 Prospective Development 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 Prospective Development. 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 Donegal County Council on request.

Once the Prospective Development 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 Prospective Development:

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.