
INCHAMORE WIND DAC

INCHAMORE WIND FARM

CO. CORK

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)



May 2023

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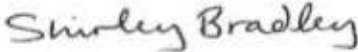

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DOCUMENT APPROVAL

PROJECT	Inchamore Wind Farm	
CLIENT / JOB NO	Inchamore Wind DAC	6226
DOCUMENT TITLE	Construction Environmental Management Plan	

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Date May 2023	Signature 	Signature 

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INCHAMORE WIND FARM, CO. CORK
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

CONTENTS

1	INTRODUCTION	1
1.1	Background to Report	1
1.2	Construction Environmental Management Plan (CEMP): Aims & Objectives	1
1.3	CEMP Development & Implementation	2
1.4	CEMP Roles & Responsibilities	3
1.5	CEMP Structure	4
2	PROJECT INFORMATION	7
2.1	Site Location and Scheme Description	7
3	ENVIRONMENTAL CONTROLS	12
3.1	Human Beings and Community	12
3.2	Ecology	14
3.2.1	Ecology Mitigation Measures	15
3.2.2	Aquatic Ecology Mitigation Measures	20
3.2.3	Ornithology Mitigation Measures	22
3.3	Soils and Geology	24
3.3.1	Subsoil and Bedrock Removal – Mitigation Measures	24
3.3.2	Storage and Stockpiles – Mitigation Measures	26
3.3.3	Vehicular Movements – Mitigation Measures	27
3.3.4	Ground Stability – Mitigation Measures	28
3.3.5	Soil Contamination – Mitigation Measures	32
3.4	Hydrology and Drainage	33
3.4.1	Surface Water Quality Monitoring	33
3.4.2	Site Drainage	34
3.4.3	Excavation Works	37
3.4.4	Release of Hydrocarbons Proposed Mitigation Measures	45
3.4.5	Release of Cement-Base Products	46
3.4.6	Instream Works	48
3.5	Air and Climate	50
3.6	Archaeology and Cultural Heritage	51
3.6.1	Mitigation	52
3.7	Noise & Vibration	53
3.8	Traffic	53
3.8.1	Diversion Routes	56
3.8.2	Delivery Volume for Construction Materials	56
3.8.3	Site Entrance	57
3.8.4	Construction Material Haul Route	58

3.9	Waste	58
3.9.1	Mitigation	58
3.10	Construction	59
3.10.1	Phasing of Works	59
3.10.2	Working Hours	60
3.10.3	Site Management Procedures and Construction Methodologies	60
3.10.4	Site Security	70
3.11	Site Clearance and Construction Methods	71
3.11.1	New Site Access Roads	73
3.11.2	Cut and Fill (Excavated) Roads	75
3.11.3	Road Drainage	75
3.12	Planning Conditions and Outline Method Statements	86
3.13	Scheme Amendments	86
3.14	Register of Variations	87
4	COMMUNICATION PLAN	88
4.1	Introduction	88
4.2	Contact Sheets	88
4.3	Meetings Reports and Consultations	89
4.4	Roles & Responsibilities	89
4.5	Reporting Procedures	89
4.6	Training, Awareness and Competence	100
4.7	Emergency Preparedness and Response	101
5	CORRESPONDENCE, RECORDS & REPORTS	102
5.1	Requirements	102
5.2	Environmental Audits	102
5.3	Environmental Consents, Licenses & Permits	103
5.4	Environmental Monitoring and Measuring	103
5.5	Non-Conformance, Corrective and Preventative Action	104
6	MANAGEMENT PLANS & AVAILABLE INFORMATION	105
6.1	Management Plans	105
6.2	Contractors Requirements	105

FIGURES

Figure 1.1	Summary of CEMP Development Process
Figure 2.1	Site location and route details
Figure 3.1	Constraints Map
Figure 3.2	Map showing the proposed location of the site entrance at Inchamore Wind Farm
Figure 3.3	Contractors' Temporary Compound Plan (Excerpt from Drawing No. 6226-PL-803)
Figure 3.4	Roadside Berm
Figure 3.5	Crane Pad Hardstand Design (Excerpt from Drawing No. 6226-PL-601)
Figure 4.1	General Communication Plan

TABLES

Table 1.1	CEMP – Document Structure
Table 3.1	Traffic Volumes for Wind Farm Site Infrastructure
Table 3.2	Traffic Volumes for Turbine Components
Table 3.3	Traffic Volumes for Grid Works
Table 3.4	Site Entrance Preparation CMS
Table 3.5	Contractors' Compound and Welfare Facilities CMS
Table 3.6	Excavation and Spoil Management Method Statement
Table 3.7	Turbine Base Construction Method Statement
Table 3.8	Typical Hardstands Construction Method Statement
Table 3.9	Relevant Planning Conditions and Related Documentation
Table 3.10	Scheme Amendments
Table 3.11	Register of Variations
Table 4.1	Contact Sheets
Table 4.2	Meetings, Reports and Consultations
Table 4.3	Roles and responsibilities
Table 5.1	Record of Environmental Consents, Licenses and Permits Issued
Table 6.1	List of Management Plans

PLATES

Plate 3.1:	Turbine Foundation under Construction with Adjoining Crane Pad
Plate 3.2:	Wind Turbine Foundation
Plate 3.3:	Wind Turbine Erection
Plate 3.4:	Assembly of Wind Turbine Blades
Plate 3.5:	Crane for Wind Turbine Erection

MANAGEMENT PLANS

- Management Plan 1 - Emergency Response Plan
- Management Plan 2 - Water Quality Management Plan
- Management Plan 3 - Surface Water Management Plan
- Management Plan 4 - Peat and Spoil Management Plan
- Management Plan 5 - Waste Management Plan
- Management Plan 6 - Decommissioning Plan
- Management Plan 7 - Traffic Management Plan

1 INTRODUCTION

1.1 Background to Report

Jennings O'Donovan & Partners Limited, on behalf of Inchamore Wind DAC, has prepared this Construction Environmental Management Plan (CEMP) for the construction of the proposed five turbine, Inchamore Wind Farm and the improvement works to roads to facilitate turbine delivery. The Development, as proposed, has been designed to ensure that any environmental impacts which may arise can be appropriately mitigated such that there will be no likely significant environmental effects.

This document has been prepared on the basis that this document will be further developed and expanded following the appointment of the Contractors for the main construction works. Some items of this CEMP can only be finalised with appropriate input from the Contractors who will actually carry out the main construction works. This CEMP identifies, for the incoming Contractors, the key planning, environmental and contract document constraints that must be adhered to in order to deliver optimum environmental reassurance for the Site.

The preparation of this document, and its continued development, is considered to be an appropriate mechanism to address the requirements to of the aforementioned condition to ensure the appropriate management of construction activities in accordance with the relevant environmental requirements.

This document should be read in conjunction with the Appropriate Assessment Screening Report, Natura Impact Statement, Environmental Impact Assessment Report (EIAR), Planning Report and Planning Application Drawings.

1.2 Construction Environmental Management Plan (CEMP): Aims & Objectives

This CEMP has been developed in accordance with the Institute of Environmental Management and Assessment Practitioner "*Environmental Management Plans*", Best Practice Series, Volume 12, December 2008.

The principal objective of this CEMP is to avoid, minimise and control adverse environmental impacts associated with the development of the wind farm. As such, the Contractors commit to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts associated with the Development.

This CEMP aims to define good practice as well as specific actions required to implement mitigation requirements as identified in the EIAR, the planning process and/or other licensing or consenting processes.

The CEMP will be developed further, and/or amended where necessary, to take account of any additional information which may be made available from the detailed design process or site surveys etc.

The CEMP will form part of the main Civil Balance of Plant Construction works Contract as well as the Electrical Balance of Plant Construction works content. The Contractors will take account of the structure, content, methods and requirements contained within the various sections of this CEMP when further developing this document (to include environmental plans) as required by their Contract.

While this version of the CEMP provides a benchmark for good practice, where avoidance or further minimisation of risks to the environment can be demonstrated through use of alternative methods or improvements to current practices, the Contractors will implement these wherever possible, subject to approval from environmental monitoring personnel.

1.3 CEMP Development & Implementation

The CEMP has been prepared as part of the planning application for Inchamore Wind Farm. It is a live document on site and will be developed further by the Contractors with site specific method statements and plans as required prior to each phase of the works. It is also effectively a document management system for recording information and data relating to environmental checks, reports, surveys, monitoring data and auditing. Upon completion of the construction works, the Contractors will submit a complete electronic copy of the final CEMP to the client for their records. This final CEMP will include electronic scans of all hard copy reports, data, field records and correspondence which are gathered over the course of the construction works.

While version numbers will remain fixed depending on the stage of the Project, it is acknowledged that the CEMP is a continually evolving document which can be updated in part or whole, at any stage of the Project. Hence, revision and document distribution records are included at the front of each CEMP document to enable individual documents to be updated at any time. A summary of the CEMP development process and the required input from the main parties involved in the post planning and construction of the wind farm are

indicated in **Figure 1.1**. The Contractors will be responsible for further development of the CEMP in line with other relevant licenses and consents. This may involve liaising with statutory bodies where appropriate.

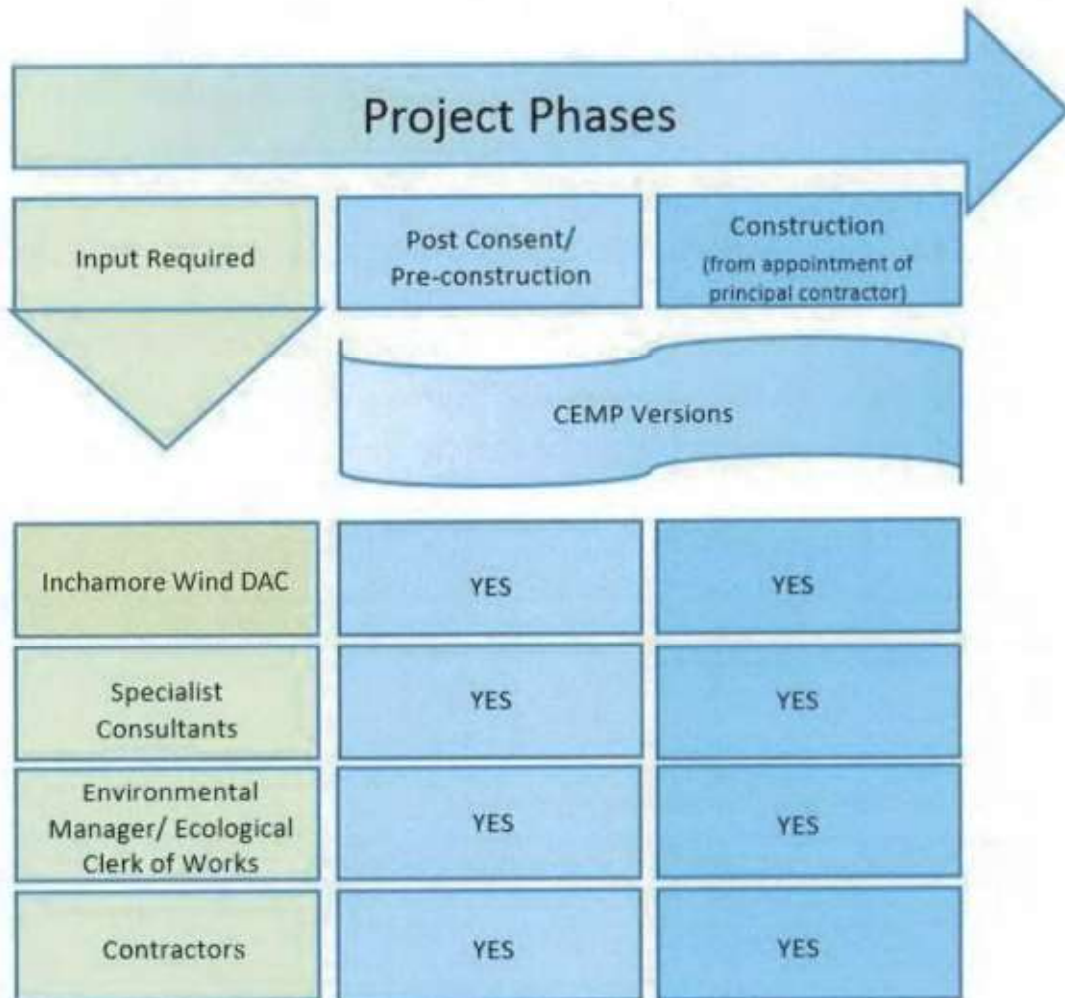


Figure 1.1 Summary of CEMP Development Process

1.4 **CEMP Roles & Responsibilities**

Prior to commencement of construction works, the Contractors will identify a core Environmental Management Group, comprising of specific project personnel and the Ecological Clerk of Works. The Environmental Management Group will meet monthly to discuss the monthly environmental report and will advise site personnel on areas where improvements may be made on site. The group will draw on technical expertise from relevant specialists where required, including the Resident Engineer and will liaise with other relevant external bodies as required.

The Developer will appoint an Ecological Clerk of Works who will be responsible for coordination, compliance monitoring and continued development of the CEMP and any other surveys, reports or method statements required. The Ecological Clerk of Works will also review the Contractors' method statements and environmental plans as required by the CEMP, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group and required liaisons between Inchamore Wind DAC the Contractors, the Planning Authority and other statutory authorities.

1.5 **CEMP Structure**

The CEMP is divided into discrete Sections which are designed to be filed as separate documents / folders if required. A copy of the CEMP documents / folder(s) will be kept in the site offices for the duration of the site works and will be made available for review at any time. The Contractors Ecological Clerk of Works will be responsible for the CEMP and will keep all sections updated throughout the construction phase.

Where a Contractor has standard documents within his own company / corporate Environmental Management Plans which cover a particular requirement of this CEMP, these will either be inserted or cross referenced within the relevant Section of this CEMP.

The CEMP Sections are listed in **Table 1.1** as follows:

Table 1.1: CEMP – Document Structure

Section	Title & Brief Description	Contractors Development Required
1	Introduction	No (Information purposes only)
2	Project Information Provides details on site location, scheme description and a summary of the environmental sensitivities at the Site (as derived from the Appropriate Assessment Screenings and other information where available).	No (Information purposes only)
3	Environmental Controls Provides details on relevant Planning Consent Conditions and mitigation measures outline in the EIAR and NIS. Any documents prepared by Inchamore Wind DAC in response to Consent Conditions will be recorded in Table 3.9. Table 3.10 contains a record of all	Yes Any documents prepared by the Contractors in response to Consent Conditions will be recorded by the Contractors in Table 3.9 and inserted in the CEMP where necessary. Any Scheme Amendments and / or Variations

Section	Title & Brief Description	Contractors Development Required
	Scheme Amendments and Table 3.11 a Register of Variations.	to the CEMP required during the works will be recorded by the Contractors in Tables 3.2 and 3.3.
3	<p>Environmental Communications Plan</p> <p>Contains details on specific requirements relating to:</p> <ul style="list-style-type: none"> Contact details for Inchamore Wind DAC, personnel, technical specialists, Contractors' personnel, regulators, landowners, other stakeholders etc.; Meetings, reports and consultations. Roles and responsibilities; and General reporting procedures and tasks. 	<p>Yes</p> <p>The Contractors will:</p> <ol style="list-style-type: none"> Insert contact information for regulatory authorities and other stakeholders (where not already provided) into Table 4.1 Refer to Table 4.2 for details on requirements for meetings, reports and consultations Insert information on Contractors' appointments and responsibilities relating to environmental management and implementation of this CEMP into Table 4.3. Refer to Figure 4.1 for a summary of the main communication lines.
5	<p>Correspondence, Records, Reports</p> <p>This Section relates to document control and retention of records. The information at the start of Section 4 provides:</p> <ul style="list-style-type: none"> A list of all documents to be retained / filed within the CEMP. <p>Table 5.1 provides a record of all Environmental Consents, Licenses and Permits issued for the project.</p>	<p>Yes</p> <p>The Contractors will complete Table 5.1. Throughout the duration of the Contract, the Contractors will insert / file all communication records, data, field records and reports associated with Environmental Management and implementation of this CEMP into this Section 5. This Section may be subdivided into sub-folders for specific information relating to discrete areas of Environmental Management (such as waste management, pollution prevention, water quality monitoring, ecology etc). Alternatively, this information may be filed within the individual Management Plans in Section 6. The filing method selected by the Contractors will be made explicit at the start of Section 5.</p>

Section	Title & Brief Description	Contractors Development Required
6	<p>Management Plans & Available Information</p> <p>Management Plans include the following:</p> <ul style="list-style-type: none"> • MP1 Emergency Response Plan (ERP) • MP2 Water Quality Monitoring Plan (WQMP) • MP3 Surface Water Management Plan • MP4 Peat and Spoil Management Plan • MP5 Waste Management Plan • MP6 Decommissioning Plan • MP7 Traffic Management Plan 	<p>Yes</p> <p>The Contractors is required to develop the Management Plans and/or include additional information or method statements as appropriate and where required by the Contract. The Development of the Management Plans will generate more site-specific documents which address particular environmental management procedures applicable for works in specified areas of the Site. These Management Plans form the Contractors' Environmental Plans (for example, Spoil Management Plan). Table 6.1 lists all Management Plans and provides information on Contractors' responsibilities.</p>

2 PROJECT INFORMATION

2.1 Site Location and Scheme Description

The Site, as shown in **Figure 2.1**, is located within an agricultural and forested landscape, between Milleeny, Co. Cork, Coomagearlahy, and Derryreag, in Co. Kerry. The Site is located 5.9 km west of Ballyvourney, Co. Cork and borders the county boundary between Cork and Kerry. It is 54 km west of Cork City, and 23 km north-east of Kenmare, Co. Kerry.

The Development is located within the townlands of Inchamore, Mileeny Derryreag and Derreenaling.

The overall length of the grid connection between the substation and the existing 220 kV GIS substation (**Figure 3.1**) is 19.9 km, of which 1.3 km is within the Site. The remaining 18.6 km is located off-road and in third-party lands through the townlands of Inchamore, Derryreag, Derreenaling, Cummeenavrick, Glashacormick, Clydaghroe, Cummeennabuddoge and Caherdowney. The proposed grid connection will consist of underground 38 kV cables.

Temporary works will be required to accommodate the delivery of the turbine components from Ringaskiddy Port. These temporary works are included as part of this application and are located on the access road from the N22 to the Site.

The Site extends to 170 ha of which 145.4 ha largely consists of low yielding, commercial forestry. Coillte own 76.0 ha of the forestry (52% of forestry on site) while 69.4 ha (47%) of the forestry is owned privately.

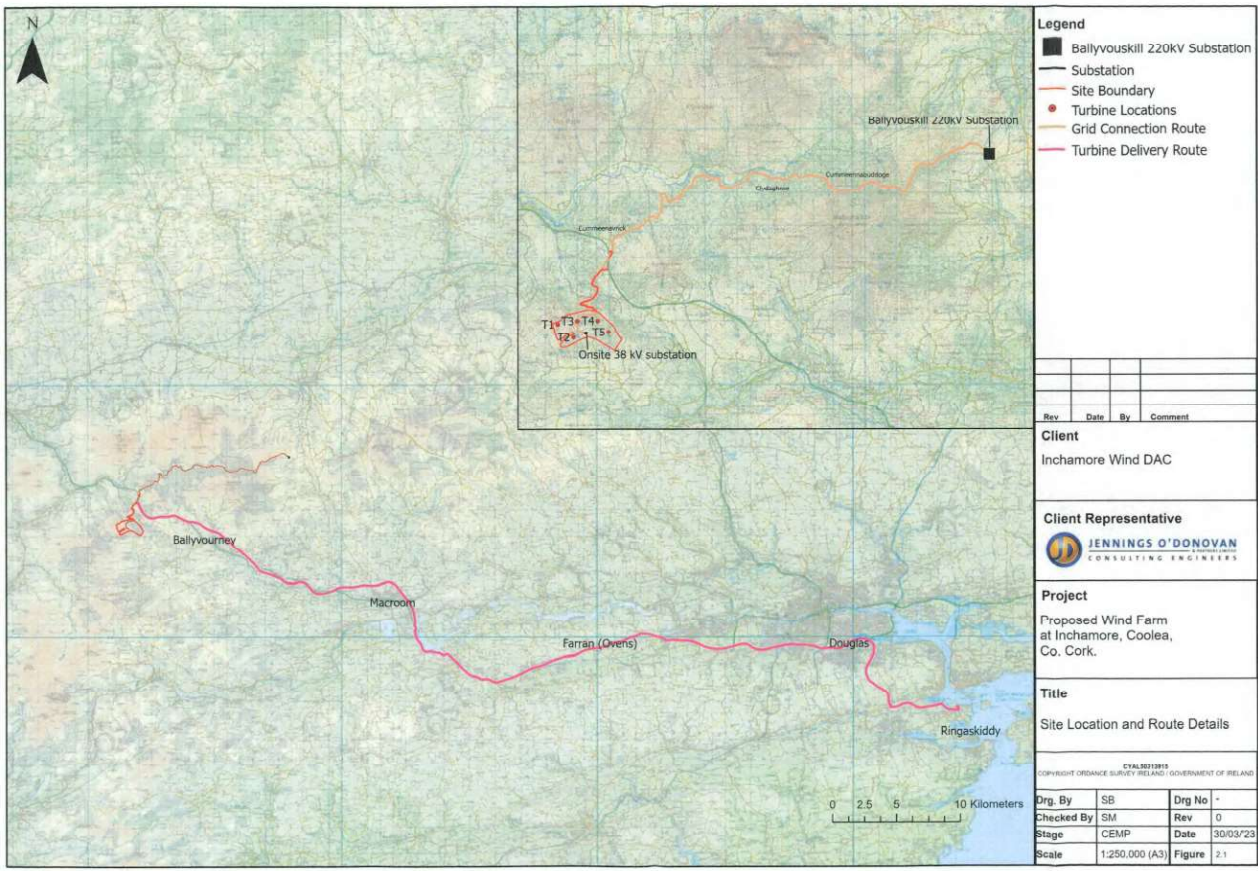
Coillte owned land comprises different stages of coniferous plantation forestry. The species comprise mainly of Sitka Spruce with small pockets containing Lodgepole Pine, Alder, Birch and Beech.

The remaining land (24.6 ha) is third party property and the principal land use in the general area consists of a mix of agricultural sheep and cattle grazing, farmland, residential properties, agricultural structures and open mountain heath.

There are 39 houses within 2 km of the proposed turbines.

In addition to this, there is an abandoned house located to the west of the proposed substation, on Coillte lands and within the Site. This house is under the ownership of Coillte and will not be occupied for the lifetime of the Development.

Of the 39 No. houses within 2 km of the proposed turbines, the closest house to a turbine that is to be assessed as part of this EIAR, is H1. This is located 753 m from T2.



Legend

- Ballyvouskill 220kV Substation
- Substation
- Site Boundary
- Turbine Locations
- Grid Connection Route
- Turbine Delivery Route

Rev	Date	By	Comment

Client
Inchamore Wind DAC

Client Representative
 JENNINGS O'DONOVAN
CONSULTING ENGINEERS

Project
Proposed Wind Farm at Inchamore, Coolea, Co. Cork.

Title
Site Location and Route Details

CTAL00210815
 COPYRIGHT ORDNANCE SURVEY IRELAND GOVERNMENT OF IRELAND

Drw. By	SB	Drw No	-
Checked By	SM	Rev	0
Stage	CEMP	Date	30/03/23
Scale	1:250,000 (A3)	Figure	2.1

Figure 2.1: Site location and route details

The Development will consist of the following main components:

- A wind farm with an operational lifespan of 35 years (from date of the development)
- The construction of five turbines with an overall ground to blade tip height ranging from 177 m to 185 m inclusive; a rotor diameter ranging from 149 m to 155 m inclusive; and a hub height ranging from 102.5 m to 110.5 m inclusive.
- Construction of permanent turbine hardstands and turbine foundations.
- Construction of one temporary construction compound with associated temporary site offices, parking areas and security fencing.
- Installation of a (35-year life cycle) meteorological mast with a height of 110 m and a 4 m lightning pole on top, such that the overall structure height will be 114 m.
- Development of one on-site borrow pit.
- Construction of new permanent internal site access roads and upgrade of existing internal site access roads to include passing bays and all associated drainage infrastructure.
- Development of a permanent internal site drainage network and sediment control systems.
- Construction of a permanent 38 kV electrical substation including a control building with welfare facilities, all associated electrical plant and equipment, parking, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures and works.
- All associated underground electrical and communications cabling connecting the wind turbines to the on-site wind farm substation.
- Ancillary forestry felling to facilitate construction of the Development.
- All associated site development works including berms, landscaping, and soil excavation.
- Upgrade of existing forest access roads to include passing bays and all associated drainage infrastructure.
- Upgrade works on the Turbine Delivery Route to include the following:
 - Works at an entrance to an existing forest road accessed off the N22 to include localised widening of the forest road and creation of a splayed entrance, removal of existing vegetation for visibility splays and removal of street furniture to facilitate

construction traffic including the delivery of abnormal loads and turbine component deliveries.

A 10-year planning permission and 35-year operational life for the wind turbines and met mast, from the date of commissioning of the entire wind farm is being sought. This reflects the lifespan of modern-day turbines.

A permanent planning permission is being sought for the substation and all associated electrical plant, equipment cabling security fencing and gates, wastewater holding tank, and all ancillary structures and works as these will become an asset of the national grid under the management of ESB & EirGrid and will remain in place upon decommissioning of the wind farm.

The Grid Connection consists of one 38 kV substation (to include one control building with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures and works) and a 38 kV cable to connect to Ballyvouskill 220 kV Substation.

A temporary access road off the N22 in the townland of Cummeenavrick will facilitate the safe turning of vehicles leaving the Site.

Permission is not being sought for a Grid Connection Route or the turning area in Cummeenavrick, however the below is assessed as part of the Project in the EIAR:

- All works associated with the permanent connection of the wind farm to the national electricity grid comprising a 38 kV underground cable in permanent cable ducts from the proposed, permanent, on-site substation, in the townland of Inchamore and onto the townlands of Inchamore, Derreenaling, Derryreag, Cummeenavrick, Glashacormick, Clydaghroe and Cummeennabuddoge to the existing Ballyvouskill 220 kV Substation in the townland of Caherdowney.
- The construction of a temporary access road off the N22 in the townland of Cummeenavrick to facilitate a 180 degrees turning manoeuvre by construction vehicles and reinstatement at the end of the construction period.

3 ENVIRONMENTAL CONTROLS

This CEMP is informed by Planning Conditions where the Development is granted planning consent, mitigation measures set out in Environmental Impact Assessment Report (2023) and associated documents and by the guidance documents and best practice measures listed below. This CEMP will be adhered to and further developed by the Contactor and will be overseen by the project representative/foreman.

Guidance Documents

- Construction Industry Research and Information Association (CIRIA) (2006) Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London.
- CIRIA (2006) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006).
- COFORD (2004) Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads.
- CIRIA (2015) SuDS Manual, (CIRIA Report C753, 2015)
- Coillte (2009): Forest Operations & Water Protection Guidelines.
- Department of Agriculture, Food and the Marine (2018) DRAFT Plan for Forests & Freshwater Pearl Mussel in Ireland – Consultation Document.
- Forestry Commission (2004) Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh.
- Forest Services (2006) Draft Plan for Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures.
- Forest Service (2000) Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.
- IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- GPP1 (2020) Understanding your Environmental Responsibilities – Good environmental Practices, NetRegs.
- GPP 5 (2018) Works and Maintenance In or Near Water, NetRegs.
- GPP21 (2021) Pollution Incident Response Planning, NetRegs.
- GPP 22 (2018) Dealing with Spills, NetRegs.

3.1 Human Beings and Community

The assessment set out in **Chapter 4: Population & Human Health** has not identified any likely significant effects from the Project on population or human health. The Project has been

assessed as having the potential to result in effects of slight positive, long-term impact overall. Cumulative effects are predicted unlikely.

The main mitigation measure is by design or avoidance. A suitable separation distance from turbines and other key infrastructure to properties has been embedded in the EIA Development design. Additional mitigation to protect site personnel and the public will also be implemented in the event of damage to a turbine and subsequent likely turbine or turbine component failure.

These are:

- Turbines will be procured from a reliable manufacturer and will have undergone vigorous safety checks during design, construction, commissioning and operation.
- Physical and visual warnings such as signs will be erected as appropriate for the protection of site personnel and the public.
- Facility for remote turbine deactivation will be provided.
- Access to turbines for site personnel will be restricted in storm events. Where access by site personnel is required safety precautions may include remotely shutting down the turbine, yawing to place the rotor on the opposite side of the tower door and parking vehicles at a distance of at least 100 m from the tower. All personnel will be fitted with appropriate Personal Protective Equipment. Regular maintenance and inspections will take place during the 35-year operational phase. The final turbine model chosen will be in line with International Electrotechnical Commission 61400-1 safety standards. Maintenance visits will take place as needed with the Supervisory Control and Data Acquisition (SCADA) control system monitoring turbine performance remotely. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations. Warning signs and security infrastructure will be in place around the onsite switchgear and control building to provide for public safety.
- Access to the turbines will be via the door at the base of the turbines. The turbine access door will otherwise be securely locked at all times.
- Measures are set out in **Chapter 15: Transport and Transportation** relating to how delivery of goods and services would be managed during works to minimise impacts.

Once the above mitigations are taken into account, the residual risk on population and human health is assessed to be an imperceptible, long-term effect.

3.2 Ecology

All mitigation measures have been developed in the context of national and international legislative guidance for the protection and management of flora, habitats of conservation importance, fauna and aquatic ecological interest.

Guidelines to be adhered to in the delivery of the CEMP and method statements include the following:

- *'Guidelines on protection of fisheries during construction works in and adjacent to waters'* (Inland Fisheries Ireland, 2016)
- *'Guidelines for the treatment of Badgers prior to the construction of National Road Schemes'* (National Roads Authority, 2005)
- *'Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of National Road Schemes'* (National Roads Authority, 2006a)
- *'Guidelines for the treatment of bats during the construction of national road schemes'* (National Roads Authority, 2006b)
- *'Guidelines for the treatment of Otters prior to the Construction of National Road Schemes'* (National Roads Authority, 2006c)
- *'Guidelines for the crossing of watercourses during the construction of national road schemes'* (National Roads Authority, 2008)
- *'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* (National Roads Authority, 2010)
- CIRIA (2001). Control of water pollution from construction sites - Guidance for consultants and contractors (C532). Construction Industry Research and Information Association, London.
- CIRIA (2019). Culvert, screen and outfall manual (C786). Construction Industry Research and Information Association, London.
- DHPLG (2019). Draft Revised Wind Energy Development Guidelines. Department of Housing, Planning and Local Government. December 2019
- Enterprise Ireland (unknown). Best Practice Guide (BPGCS005) Oil storage guidelines.
- IFI (2016). Guidelines on Protection of Fisheries during Construction Works in and adjacent to waters. Inland Fisheries Ireland, Dublin.
- IWEA (2012). Best Practice Guidelines for the Irish Wind Energy Industry. Guidance prepared by Fehily Timoney & Company for the Irish Wind Energy Association.
- Kilfeather, P.K. (2007). Maintenance and protection of the Inland Fisheries resource during road construction and improvement works. Southern Regional Fisheries Board.

- Murphy, D.F. (2004). Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board.
- NRA (2008). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. National Roads Authority.
- SNH (2019). Good Practice during Wind Farm Construction (4th edition). Scottish Natural Heritage.

The description of mitigation measures is provided in terms of mitigation by avoidance, reduction and remediation.

3.2.1 Ecology Mitigation Measures

3.2.1.1 Mitigation for habitat loss

The permanent loss of habitat to facilitate the construction of the project is estimated at 31 ha. This will result from the following:

- Turbines foundations and hardstand areas
- Foundation for substation
- Foundation for met mast
- Wind farm road system

The majority of the affected habitat, approximately 26.43 ha, is conifer plantation. As conifer plantation is a non-native habitat that is not classed as a key ecological receptor, the permanent loss of this habitat is rated as Not Significant.

The construction of turbine T1 will result in the permanent loss of 1.67 ha of wet heath and wet heath/blanket bog mosaic. A small area of wet heath (0.33 ha) will be lost as a result of the T2 construction. The total loss of wet heath and wet heath/blanket bog mosaic is approximately 2 ha. The peatland habitat within the site is part of a larger complex of heath/bog habitats, which is rated as of County Importance. The loss of 2 ha of Annex I listed habitats, which have good conservation status and functionality, is rated as a Significant Adverse effect of Permanent duration. Mitigation for loss of heath and bog habitats will be provided through the restoration and protection of 10.6ha of degraded bog habitats as part of the Habitat Enhancement Plan.

The construction of turbine T3 will result in the loss of 1.1 ha of cutover bog. However, the cutover bog at this site is of poor quality (rated as being of Local Importance, higher-lower value). The significance of the effect is rated as Slight Adverse of Permanent duration.

3.2.1.2 Mitigation for Disturbance

Areas adjoining the infrastructure will be disturbed by the construction works, including the need for construction of a drainage system and for the insertion of the electrical cabling including along the grid connection route.

- A programme of ongoing monitoring and rehabilitation will be followed during construction phase. Monitoring and rehabilitation of the following peatland categories (see **EIAR Figure 5.1**) will take place: (i) mosaic of wet heath, dry heath and outcropping rock, (ii) mosaic of wet heath and blanket bog, and (iii) wet heath dominated by *Molinia caerulea*.
- An Ecological Clerk of Works (ECoW) will be on site for the duration of the construction phase. As required, this person will be assisted by a consultant ecologist with expertise in peatland habitats. The consultant ecologist will be employed by the client and will be independent of the Contractor.
- As ground excavations are opened up, the ECoW will walk the work corridor with a surveyor and within sensitive peatland areas will mark out (with range poles or equivalent) the extremities of the required work area. This will identify the limit of the work area and will prevent unnecessary incursions by the Contractor onto adjoining intact heath or bog.

3.2.1.3 Re-vegetation of bare surfaces

An ecological objective is to minimise the area of exposed peat surface and to encourage revegetation. This will be achieved by the removal from suitable areas of the vegetated heath and bog surface (cut out as sods or 'turves') within the work footprint at T1, the storage of this material, and subsequent reuse around the turbine and hardstand margins.

The surface turves of vegetated bog and heath will be dug out to a depth of 30 cm or more using a dumper/digger with a bucket. Care will be taken to keep the turve as intact as possible and the vegetated side upwards (though this is not always possible). The turves will be loaded to a trailer and transported to a pre-identified storage area. The storage area will be located in an area of site (not heath or bog) where disturbance during the storage period will not occur. The turves will be off-loaded from the trailer and placed side by side and vegetation side upwards. They will be placed in single layers, i.e., not piled on top of each other. Should storage be for prolonged periods (months), the turves may need to be

watered during dry spells. When ready for placement at the finished turbine/hardstand, they will be lifted with a dumper and bucket and taken to the destination. Here they will be off-loaded, placed side by side on the disturbed peat surface with vegetation side up. The turves will be bedded in with the bucket of a dumper so that they form a continuous layer without gaps between them. This approach will provide almost immediate cover of the bare surfaces. All of the above will be monitored by the ECoW.

It is noted that where adequate peat depth is not available to dig out turves, as well as in the cutover bog at T3, the surface peat will be scraped off and stored in piles in a location similar to that for turves. This material will contain root stock, rhizomes and seed of peatland plant species and can be spread on disturbed surfaces when works are complete to assist in revegetation.

3.2.1.4 Mitigation for Small Cudweed (*Filago minima*)

A pre-construction survey will take place to map its distribution along tracks in the summer before construction commences.

The areas where the plant occurs will be avoided by the trench excavations and all works in such areas will be supervised by an ecologist with experience in rare plants.

Should the plant occur across an entire width of track, a licence will be sought from NPWS to remove the plants from the required work area and to transplant to a suitable location elsewhere. The application for a licence will be supported by a Management Plan for the species compiled by an ecologist with experience of rare plants and plant translocation schemes.

3.2.1.5 Badgers

No signs of badger presence were found on site during the baseline surveys in 2021. As required under the Wildlife Acts, mitigation is required to ensure that any potential active setts are not disturbed.

Prior to construction, a survey for the presence of badgers will be carried out at the time of the tree felling operations. This will be by an ecologist with experience of badger survey and working in association with the tree felling contractor. Survey for badger is preferably carried out in the period October to March when vegetation cover is low.

Before any felling commences, the ecologist will survey marginal areas around the plantation for signs of badger presence. Also, any accessible areas within the plantation, such as unplanted gaps, will be searched for signs. Once felling commences, the ecologist will monitor the progression of the works as the required areas are cleared.

Should there be any evidence of a badger sett, all work will cease immediately and a buffer zone will be established where felling works will be restricted. Mitigation will be implemented as considered necessary. This would include application to NPWS for permission to close a sett that could be disturbed by the works. Note that since closure of active setts is prohibited during the badger breeding season (December to June inclusive), scheduling of the tree felling process is important to avoid delays.

3.2.1.6 Otter

The main study area was a distance of at least 150 m upstream and downstream of any proposed crossing points of watercourses considered suitable to support otter (after NRA 2008 & NRA 2009b), including the margins of the watercourse to a distance of 10 m width. Otters were not recorded on site and are not likely to occur due to the small size of the watercourses within the site.

3.2.1.7 Common frog

Areas where construction works are due to commence during the period February to August will be checked by the Ecological Clerk of Works for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed and transferred under licence from National Parks and Wildlife Service.

3.2.1.8 Bats

To minimise risk to bat populations, a buffer zone is recommended around any forestry, treeline, hedgerow, woodland feature, into which no part of the turbine should intrude. Using the formula quoted below, based on Nature Scot Guidance, the minimum distances of wind turbines for bat mitigation are calculated for each of the potential turbine models.

$$\text{formula: Buffer distance} = \sqrt{(50 + b1)^2 - (hh - fh)^2}$$

where *bl* = blade length, *hh* = hub height, *fh* = feature height (all in meters)

The dimensions of the potential wind turbine models proposed to be used are provided in the table below. Feature height is 25 m (typical conifer plantation height, the predominant habitat

type present within the survey area). Dimensions of Blade length and Hub height were provided and the calculation is as follows:

$$\text{Buffer distance} = \sqrt{(50 + 77.5)^2 - (102.5 - 25)^2}$$

$$\text{Buffer distance} = 101.24 \text{ m}$$

- An ecologist/Ecological Clerk of Works will supervise areas where vegetation, scrub and hedgerow removal will occur prior to and during construction.
- Where possible construction will take place during daylight hours in order to minimise light disturbance on bats. Should fixed lighting be required these will consist of LED luminaires using warm white colours < than 2700 Kelvin. Luminaires will feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats. Lighting will be directional and avoid lighting key features suitable for bat activity such as treelines or woodland edge. Some works along the cable route and the Site may occur at night (**EIAR Chapter 2: Project Description**) but the project ecologist/Ecological Clerk of Works will limit night-time works to sections of the route / site which avoid sensitive features (e.g., mature treelines).
- In the case that after additional bat surveying and roosts need to be relocated, a National Parks and Wildlife Service wildlife derogation licence will be applied for.
- Where bat roosts have been identified prior to construction, construction will be delayed until the bats have gone or have been removed to avoid disturbance.

3.2.1.9 Kerry Slug

The following measures will minimise the identified potential impacts on the local Kerry Slug population:

- Areas of suitable habitat (wet heath and outcropping rock) that occur outside of the footprint of the Development will be avoided during the course of construction thereby minimising the loss and disturbance of Kerry Slug habitat.
- Immediately prior to undertaking works in areas of suitable habitat (wet heath / blanket bog / rock outcrop), the project ecologist will check for the presence of Kerry Slug. Should slugs be discovered, they will be transferred to suitable habitat in the surroundings. Similar on-going monitoring of suitable habitat within works areas will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.

3.2.2 Aquatic Ecology Mitigation Measures

- No works will take place within the 65 m buffer zone of watercourses except for the watercourse crossings, road development and drainage measures as detailed in **Management Plan 2: Water Quality Management Plan** and **Management Plan 3: Surface Water Management Plan**.
- The site compound and any temporary soil storage areas will be located at a minimum distance of 65 m from any watercourse. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment. Further details can be found in **Management Plan 4: Peat and Spoil Management Plan**, **Management Plan 3: Surface Water Management Plan** and a **Management Plan 2: Water Quality Management Plan**.
- All site drainage, as described in the **Management Plan 3: Surface Water Management Plan** and shown on associated drawings, will be directed through either sediment traps, settlement ponds and / or buffered drainage outfalls to ensure that total suspended solid levels in all waters discharging to any watercourse will not exceed 25 mg/L (IFI, 2016). All construction site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-containment facility prior to discharge.
- Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Environmental Manager or Ecological Clerk of Works to ensure satisfactory operation and/or maintenance requirements. A full specification for the water quality monitoring is presented in the **Management Plan 2: Water Quality Management Plan**.
- The storage of oils, hydraulic fluids, etc., will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005).
- The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment.
- All machinery operating at the Site will be fully maintained and routinely checked to ensure no leakage of oils or lubricants occurs. All fuelling of machinery will be undertaken at a discrete "fuel station" (Planning drawing 6226-PL-803) designated for the purpose of safe fuel storage and fuel transfer to vehicles.
- The construction of the watercourse crossings will be undertaken during the period 1st July to 30th September as set out in Inland Fisheries Ireland Guidance (2016) to avoid accidental damage or siltation of spawning beds, unless otherwise specified by Inland Fisheries Ireland during consultations in advance of works.
- Any extensions to existing drainage culverts on the site roads will be undertaken in dry conditions and in low flow conditions on drains that do not run dry.

- The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment (see **Chapter 9: Hydrology and Hydrogeology** for further details).
- There will be no batching or storage of cement allowed in the vicinity of any watercourse crossing construction area.
- Procedures (as detailed in **Chapter 9: Hydrology and Hydrogeology**) will be put in place to ensure the full control of raw or uncured waste concrete to ensure that watercourses will not be impacted.
- Should there be any incidents of pollution to watercourses, immediate steps as specified in the Emergency Response Plan (**Management Plan 1: Emergency Response Plan**) will be undertaken to resolve the cause of the pollution and where feasible, mitigate against the impact of pollution.
- Re-seeding / re-vegetation of all areas of bare ground or the placement of Geo-jute (or similar) matting will take place prior to the operational phase to prevent silt-laden run-off. The seed mix will contain only suitable native species of plant.
- Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not in natural streams or drainage lines.
- A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.

The use of Sustainable Drainage Systems (SuDS) on site will eliminate risk to watercourses from sedimentation during the construction phase of the Project.

All surface water management measures will be put in place concurrently during the development of the road network. The measures entail the following key elements which are described in detail within the **Management Plan 3: Surface Water Management Plan**:

- Open Constructed drains for development run-off collection and treatment.
- Collection Drains for upslope "clean" water collection and dispersion.
- Filtration Check Dams to reduce velocities along sections of road which run perpendicular to contours.

- Settlement Ponds and Buffered Outfalls to control and store development runoff to encourage settlement prior to discharge at Greenfield runoff rates.
- To reduce the amount of silt laden water to be treated, clean water drains will be created upstream of the works area to divert water away from construction areas, thereby lessening the volume of water to be treated onsite.
- De-watering of excavations where required, will be through filtered 'silt socks' / dewatering bags or a 'Siltbuster' or similar system, prior to discharge. Excavations will be kept to the absolute minimum for the specific task and undertaken on a 'just in time' basis to minimise the extent of silty water generated and requiring treatment prior to discharge.

3.2.3 Ornithology Mitigation Measures

o Measures for Loss of Habitat

The implementation of the Habitat Enhancement Plan (**EIAR Appendix 5.5**) will enhance blanket bog habitat for bird species associated with peatland habitats, including red grouse, merlin and meadow pipit. The regrowth of ling heather in the eroded blanket bog habitat would be of particular benefit to the local red grouse population.

This Plan, which provides for the enhancement of approximately 10.6 ha of blanket bog habitat, will mitigate for the loss of breeding bog and heath habitat for birds.

3.2.3.1 Measures to Prevent Disturbance to Breeding Hen Harriers

A section of the grid connection route is located along the route of an existing forestry road which runs north of the Mullaghanish to Musheramore Mountain SPA, with the closest distance between the cable route corridor and the SPA being 170 m. To prevent any potential disturbance to nesting and/or foraging Hen Harriers, works will be restricted along the identified section to the period outside of the breeding season (March-August). This will ensure that the breeding Hen Harrier population within the SPA is not disturbed by the proposed wind farm project.

3.2.3.2 Measures to Minimise Potential Disturbance to Sensitive Bird Species

The present assessment has identified the potential for disturbance effects on two breeding species of conservation interest as a result of the construction works (see **Section 7.4.2.2**). These species are merlin and red grouse. Best available evidence has been reviewed and it is suggested that these species could be disturbed by works, including tree felling, at the following distances:

Merlin	500 m
Red grouse	500 m

As noted in Section 7.4.2.2 of **EIAR Chapter 7: Ornithology**, pre-construction breeding surveys for selected species are required on the basis of the following:

1. Suitable breeding habitat exists within and around the Site for sparrowhawk, kestrel and snipe, which were recorded as non-breeding during the baseline surveys but which could breed within the study area in future years;

Should the pre-construction surveys indicate a requirement for protection from construction-related disturbance, including tree-felling, of any relevant species, appropriate measures will be taken in line with all relevant legislation and best practice guidance available at the time to ensure that breeding attempts are not disturbed by construction related works.

Best available evidence has been reviewed (Currie & Elliot 1997, NatureScot 2022, Pearce-Higgins *et al.* 2012, Scottish Natural Heritage 2016) and it is suggested that the following species could be disturbed by construction works, including tree felling, at the following distances:

Sparrowhawk	200 m
Kestrel	200 m
Snipe	400 m
Woodcock	200 m

Should any of these species be recorded breeding within the given distances of the works area through surveys before and/or during construction, a buffer zone (using above distances) shall be established around the expected location of the nest (location identified as far as is possible without causing disturbance to the bird) and all works will be restricted within the zone until it can be demonstrated by an ornithologist that the species has completed the breeding cycle in the identified area. Any restricted area that is required to be set up will be marked clearly using hazard tape fencing and all site staff will be alerted through toolbox talks.

The above mitigation, if needed, will apply from March to August (inclusive) and will ensure that the works will not have an adverse effect on the identified species of conservation importance recorded during the baseline surveys or in pre-construction surveys.

Measures to Minimise Potential Disturbance to Nesting Passerine Species

A range of passerine bird species breed within the Site, including the Red-listed meadow pipit and the Amber-listed goldcrest and willow warbler. In compliance with Section 22 of the Wildlife Acts 1976 to 2021, all vegetation required to be cleared to facilitate the works will be done outside of the restricted period from 1st March to 30th August.

Should it be necessary to remove vegetation during the breeding season, for instance where bramble and ephemeral plant species have become established on ground cleared earlier, this will be surveyed by an ornithologist up to 10 days before any clearance. Should an active nest be located, the area will be restricted from works by a distance where it is considered that the works would not cause disturbance or abandonment of the nest. Such distances, which will vary according to species and local topography, will be determined by the ornithologist. The restriction will be maintained until it is established that any young birds present have fledged.

3.3 Soils and Geology

The following section details the environmental control measures which must be incorporated into the Contractors' Construction Method Statement (CMS) to ensure the protection of soils and geology. In addition, a Peat and Spoil Management Plan and a Waste Management Plan (see **Management Plans 4 and 5** respectively) have been prepared which provide further details of control measures and monitoring procedures.

3.3.1 Subsoil and Bedrock Removal – Mitigation Measures

Mitigation by Avoidance

The proposed turbines and infrastructure layout was dictated to a large degree the constraints of the existing infrastructure, peat depth and the topography. Turbines were located in areas where the existing infrastructure is utilised, peat is shallow, and the topography is favourable. The aim of this process was to minimise the volumes of subsoils to be removed either directly by excavation (turbine foundations) or as a function of cut and fill requirements (hardstands).

Mitigation by Good Practices

- Excavation of peat in areas where there is over 1.0 m in peat depth (T1, T3 and T5) will follow appropriate engineering controls (**Section 9.5.2.3, Chapter 9: Hydrology and Hydrogeology**). This will include the drainage of the peat along the proposed Site Access Roads in advance of excavation activity, one month in advance where possible. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains will not be positioned parallel to slope contours. This drainage will be attenuated prior to outfall (**Chapter 9: Hydrology and Hydrogeology**). It is noted that peat depth at the Site is generally shallow, and management of saturated peat will be required at relatively few locations of 'Moderately Deep' peat, mainly at the proposed location of T1.
- In those parts of the Site where excavation may intercept areas of peat that are >1.0 m depth (proposed locations T1, T3 and T5), a geotechnical engineer/engineering geologist will be onsite to supervise and manage the excavation works and confirm the necessity for supporting newly excavated peat exposures or redirect initial construction phase drainage to maintain ground stability.
- For side walls in all excavations a safe angle of repose will be established. For peat, the safe angle of repose is approximately 15°, which equates to a c. 10 m horizontal distance if excavating to 2.5 m depth. Due to the quality of the peat, the potential residual water content after pre-excavation drainage works or increased water content following heavy rainfall, there is a risk of localised stability issues in areas of deeper peat. Therefore, to address this risk for excavation in areas of deeper peat particularly at the proposed location of T1, excavation supports will be used, for example temporary sheet piling, or similar. This will minimise the effect of excavation to the minimum required.
- Areas of the site where deeper (>2.0 m) peat was detected during site surveys are presented in geo-constraint maps (**Appendix 8.1**), proposed hardstand areas have avoided these areas of deep peat. Similarly, the safe angle of repose for subsoils at the Site (GRAVELS), or any other material (e.g., crushed rock) arising at the site must also be considered and similar consideration and mitigation applied respectively.

Mitigation by Reuse

- Subsoil and bedrock which are excavated as part of the construction phase will be reused onsite in accordance with **Management Plan 4: Peat and Spoil Management Plan**. Bedrock material arising at the Site will be reused as fill material, but Site Access Roads and Turbine Hardstands will be surfaced with a harder rock imported to the Site.

The imported rock will be locally sourced and similar in nature to the local area in terms of geo-chemistry.

- Excess rock and soil will be reused as backfill in areas previously excavated e.g., Turbine Foundations, or as backfill in cut and fill operations.
- Geotechnical testing on the rock arising from excavation/construction activities will be carried out prior to its reuse onsite. It will only be reused for those purposes if it conforms to relevant standards (listed below). This is further detailed in **Management Plan 4: Peat and Spoil Management Plan**.
 - Good Practice during Wind Farm Construction (SNH, 2015)
 - Notes for Guidance on the Specification for Road Works Series NG 600 – Earthworks (TII, 2013)
 - Constructed tracks in the Scottish Uplands (SNH, 2015)
- Catotelm peat will be used to backfill, for example; around Turbine Foundation pads once established. Acrotelm peat will be used as a dressing on top of deposited catotelm peat to promote and re-establish flora and ensure the acrotelm layer becomes relatively cohesive in terms of localised peat stability (vegetated).
- Similarly, all soil and subsoil types identified during site investigations and during actual construction will be treated as separate materials. The arisings will be separated accordingly. This includes, for example; Acrotelm peat, catotelm peat, clays, subsoils (GRAVEL / TILL), weathered rock.
- Temporary set down / stockpile areas will be considered similarly to active excavation areas in terms of applying precautionary measures and good practices.

Mitigation by Remediation

The mitigation measures listed above, namely backfilling with peat in layers, are in effect remediation measures. These measures remediate the impacts of excavation and limits the impacts to the extent of the actual proposed infrastructure.

3.3.2 Storage and Stockpiles – Mitigation Measures

Mitigation by Avoidance and Good Practice

- No permanent stockpiles will remain on the Site. All excavated materials from the Site or introduced materials for construction will be used on site.
- No temporary stockpiles will be positioned or placed on areas of peat which have not been assessed or are indicated as being geo-hazards, particularly in areas of unacceptable factor of safety / stability (**Appendix 8.1**).

- All temporary stockpiles will be positioned on established and existing hardstand areas or in designated areas which are appropriate for short term storage.
- No temporary stockpile placed on established hardstands or within the Development footprint in areas of peat will be in excess of 1 m in height. This is due to potential localised stability and subsidence issues in relation to the peat under and in vicinity of the hardstand and stockpile.

Mitigation by Reduction

The volume of material to be managed including temporary stockpiling is directly proportional to the volumes of material required to be excavated (35,504 m³), however if managed appropriately the volume of material to be managed at any particular time can be dramatically reduced.

The **Peat and Spoil Management Plan (Management Plan 4)** identifies volumes and types of materials arising, temporary stockpiling locations, routes for reuse and remediation, requirements in terms of logistics and considerations in terms of timing and planning of movements of material.

3.3.3 Vehicular Movements – Mitigation Measures

Mitigation by Avoidance and Good Practice

- Vehicular movements will be restricted to the footprint of the Development and advancing ahead of any constructed hardstand will be minimised in so far as practical.
- Ancillary machinery will be kept on established Turbine Hardstands, and no vehicles will be permitted outside of the footprint of the Development. Land that is not proposed for the Development will be avoided.
- For the Grid Connection Route, before starting construction, the area around the edge of each joint bay which will be used by heavy vehicles will be surfaced with a terram cover (if required) and stone aggregate to minimise ground damage.
- A Geotechnical Clerk of Works will be employed during the construction phase in order to continuously monitor areas of peat. Ongoing physical stability checks and calculations will be undertaken in order to verify that safety standards are being met.

3.3.4 Ground Stability – Mitigation Measures

Mitigation by Avoidance and Good Practice

- Construction activities, including vehicular movements, will be limited to the footprint of the Development.
- Vehicular movements or construction activities outside of the footprint of the Development will be assessed by a competent geotechnical engineer before progressing.
- Temporary stockpiles will be limited to 1 m height and removed for reuse/remediation purposes or disposed offsite as soon as possible. It is envisaged that all material will be reused on site, unless obviously contaminated (for example, due to accidental hydrocarbon/fuel spill).
- All Site excavations and construction will be supervised by a geotechnical engineer/engineering geologist.
- The Contractor's * methodology statement and risk assessment will be in line with the Construction Environmental Management Plan and will be reviewed and approved by a suitably qualified geotechnical engineer/engineering geologist prior to Site operations. (* Contractor here refers to the chosen or contracted construction company at the commencement stage of the Development).

Particular attention and pre-construction assessment (developer / sub-contractor site specific risk assessment and method statement (RAMS) and on-site toolbox talks etc.) and mitigation planning will be given to any new infrastructure, for example:

- a. All works in close proximity to sensitive receptors, that is; any works with receptor buffer zones, for example, works associated with watercourse crossings. With very little distance between works and receptor, minor or localised stability issues can lead to significant consequences.

This includes, but is not limited to:

- Watercourse Crossings WC1, WC2 and WC3, and associated access tracks works within Surface Water buffers.

- b. Hardstands and access tracks in close proximity to relatively deep peat and/or steep inclines, that is; works associated with or proximal to geo-hazards.

This includes, but is not limited to:

- Areas adjacent to T1, in particular deep peat to the north / northwest, and relatively steep inclines to the south.

- Areas adjacent to T3, in particular deep peat to the north / northeast, and relatively steep inclines and elevated landslide susceptibility (GSI) to the south / southeast / east.
 - Areas adjacent to T4, in particular relatively steep inclines and elevated landslide susceptibility (GSI) to the south / southeast / east.
 - Areas adjacent to access tracks leading to T1/T2/T3, in particular deep peat to the north, and steep inclines and elevated landslide susceptibility (GSI) to south of T1 to T3 access track.
- c. Where the previous two points occur in combination, that is; geohazards which are above or upgradient of particularly sensitive areas of the site as discussed in the attached SI report (**Appendix 8.1**), and as presented in the constraints maps (**Appendices H (a – c)**) as well as **Figure 8.7**, are the most important locations to advance with due care and consideration.

Groundwater level (pore water pressure) will be kept low at all times (excavation dewatering) to avoid ground stability risks (subsidence) associated with peat and careful attention will be given to the existing drainage and how structures might affect it (**Appendix 9.6 – Tile 11**). Draining water from the construction area will be done through advanced dewatering techniques. In particular, ponding of water will not be allowed to occur in recent excavations, particularly in any areas encountered where peat is >1 m (proposed locations of T1 and T3). All deliberate or incidental sumps will be drained to carry water away from the sump following rainfall. Otherwise, this water will increase hydraulic heads locally and in turn increase pore water pressure which can potentially lead to instability.

- All peat excavated will be immediately removed from sloping areas. Peat will be carefully managed particularly when in temporary storage. Temporary storage areas will be isolated from the receiving environment by means of temporary infrastructure such as boundary berms comprised of subsoils sourced at the Site, or similar material.
- Temporary measures such as dewatering and pumping through silt bags will be employed to assist this process. Draining of stockpiled peat in a controlled manner is recommended. Similar measures will be applied to the management of subsoil arisings at the Site.
- Peat is required for reinstatement, therefore acrotelm peat (top living layer, c. 0.5 m) will be stripped off the surface of the bog and placed carefully at the margins of the Development along the Site Access Roads and hardstand margins that are characterised by near-horizontal slopes (<6°).
- Relatively high impact construction activities (e.g., excavations, movement of soils / subsoils / rock) will be limited to the spring to autumn period as this period is considered

to be the optimal seasonal period in terms of likely rainfall conditions, low soil moisture deficit (SMD), and relatively stable pore water pressure conditions (not withstanding excessive human interference of pore waters). Construction activities will not occur during periods of sustained significant rainfall events, or directly after such events (allowing time for work areas to drain excessive surface water loading and discharge rates reduce).

- A minimum 24-hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system will be implemented. When a pre-determined rainfall trigger level is exceeded (e.g., one in a 100-year storm event or very heavy rainfall at >25 mm/hr), planned responses will be undertaken. These responses will include cessation of construction until the storm event including storm runoff has passed over. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example dewatering of standing water in open excavations, etc.
- Any impact to the hydrological and/or hydrogeological regime will be avoided as far as practical in relation to identified Geo-Hazards (**Appendix 8.1**) where the presence of steep inclines, deep till deposits and iron pan give rise to elevated ground stability, particularly where the potential for impacts to hydrogeology in those area / subsoils exists.

Mitigation by Reduction

The temporary storage of construction materials, equipment, and earth materials will be kept to an absolute minimum during the construction phase of the Development.

Example: The excavation material for the construction of Site Access Roads will not progress ahead of actual track construction (as discussed under mitigation addressing vehicular movements), therefore minimising the volume of arisings to be managed. Areas for permanent deposit of material e.g., backfill adjacent to constructed infrastructure, will be identified and suitable material deposited as it becomes available. These efficiencies can be seen in the **Peat and Spoil Management Plan (Management Plan 4)**.

Mitigation by Remediation

Remediation of soils will include the deposit of suitable material where required. This will include replacement of soils / subsoils in line with baseline conditions. Remediated areas will be managed and monitored in terms of reestablishment of vegetated cover.

In the unlikely event that a peat or slope stability issue does arise on the Site during the construction or operational phases of the Development, given the variable potential extent of

associated impacts, remediation will be assessed, prescribed and monitored by a suitably qualified geotechnical engineer/engineering geologist on a case-by-case basis.

Emergency Response

Emergency responses to potential stability incidents have been assessed (**EIAR Chapter 16: Major Accidents and Natural Disasters**) and established to form part of **Management Plan 1: Emergency Response Plan** before construction works initiate.

- In the event that soil stability issues arise during construction activities, all ongoing construction activities at the particular area of the Site will cease immediately, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed.
- Provision for a peat stability monitoring programme to identify early signs of potential bog slides (pre-failure indicators, for example cracks forming). This will be done in line with Scottish Government's 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Developments 2017).
- In the unlikely event that soil and slope stability issues arise during construction activities, all ongoing activities in the vicinity will cease immediately, all operators will evacuate the area by foot, if safe to do so, until the area is assessed by competent person/s, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. The area impacted will be characterised fully and risk assessments completed prior to any further works commencing at or near the location. This assessment will be phased including initial rapid response Phase 1 Assessment which will include at a minimum the prescription of exclusion zones and preliminary mitigation steps to be taken, for example, the management of runoff in or from the affected area.
- Considering the highly dynamic nature of peat or soil stability issues at any particular site, it is important to establish an equally dynamic yet robust framework to follow in the event of an incident. Establishment of an emergency framework will follow relevant guidance to initially qualify any incident (by on site competent geotechnical engineer) and risk assess the area, and to then apply initial measures and design a complete emergency / contingency plan in line with an established structured emergency response. Emergency response will prioritise isolating and containing any materials which is being or will be intercepted by the established drainage network or receiving surface water network. Emergency materials and equipment requirements will be identified, incorporated in the CEMP, and will be managed on site with a view to be being easily accessible and readily available.

- On site training and toolbox talks will ensure any response to any potential incident is mobilised quickly and efficiently.
- Detailed emergency response protocols are specified in the **Management Plan 1: Emergency Response Plan**.

3.3.5 Soil Contamination – Mitigation Measures

Mitigation by Avoidance

Protecting soils from spills will in turn mitigate against the potential for contaminants reaching watercourses, mitigation measures for contaminants are presented in detail in **EIAR Chapter 9: Hydrology and Hydrogeology**.

Mitigation by Reduction

- Excess packaging and other materials will be discarded appropriately at the Temporary Construction Compound before advancing to the destined construction area.
- Any vehicles coming onto the Site will be required to be inspected and cleaned before leaving the Temporary Construction Compound and before advancing to the destined construction area.
- Precast concrete will be used wherever possible i.e., formed offsite. Where the use of precast concrete is not possible the following mitigation measures outlined in Section 3.4 Hydrology and Drainage will apply.

Mitigation by Remediation

Any and all contaminants will be removed from the Site in an appropriate manner when ever produced or observed; and transported and disposed of in accordance with hazardous waste as per **Management Plan 5: Waste Management Plan**.

Emergency Response

Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the Development. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.

Significant hydrocarbon spill or leak – In the event of a significant or catastrophic hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as the installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons, excavation and disposal of contaminated material.

Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.

Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the vicinity of works. Additionally, emergency responses, including methodologies, are specified in the **Management Plan 1: Emergency Response Plan**.

In the event of a significant contamination or pollution incident e.g., discharge or accidental release of hydrocarbons / fuel to surface water systems, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. The relevant authorities noted above and stakeholders will also be promptly informed.

A full Schedule of Mitigation Measures relating to Peat Management, Soils and Land Use can be seen in **Appendix 17.1**.

3.4 **Hydrology and Drainage**

The following section details environmental control measures which will be implemented on site in relation to hydrology and drainage and provide the framework within which the targeted Construction Method Statement must be prepared. In addition, a **Surface Water Management Plan** and a **Water Quality Management Plan** have been prepared (see **Management Plans 2 and 3** respectively) which provide further details of control measures and monitoring procedures.

3.4.1 **Surface Water Quality Monitoring**

The Contractors are solely responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed.

In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring is required to be undertaken by a suitably qualified Environmental Consultant(s) (qualified to minimum of degree level with a minimum of 5 years' relevant experience), prior to, during and post completion of construction works. This will include all watercourses within the catchment of the construction area. The monitoring will comprise visual, hydrochemistry and grab sample monitoring and is detailed in **Management Plan 2 Water Quality Management Plan**.

3.4.2 Site Drainage

Details of the Site drainage can be found in **Management Plan 3: Surface Water Management Plan**. The design criteria for the Sustainable Drainage Systems (SuDS) design are as follows:

- To select and install drainage.
- To minimise alterations to the ambient site hydrology and hydrogeology.
- To provide settlement and treatment controls as close to the Site footprint as possible and to replicate the existing hydrological environment of the Site.
- To minimise sediment loads resulting from the Development run-off during the construction phase.
- To preserve Greenfield runoff rates and volumes.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.
- To reduce stormwater runoff velocities throughout the Site to prevent scouring and encourage settlement of sediment locally.
- To manage the problems of erosion and allow for the effective revegetation of bare surfaces.
- To control water within the Site and allow for the discharge of runoff from the Site within the limits prescribed in the Salmonid Regulations.

3.4.2.1 Mitigation

As part of mitigation by avoidance during the design phase of the Development, surface water, and drainage buffer zones were established where applicable.

- 65 m Surface Water Buffer Zone - Mapped surface water features i.e., mapped streams, rivers, lakes. Source for mapped surface water features; EPA.
- 15 m Drainage Buffer Zone - Non-mapped drainage features i.e., non-mapped streams, natural and artificial drainage features. Source for non-mapped surface water features;

desk study and aerial photography assessment, Lidar topographic data and field observations. Note: Significant drainage features will be identified and mapped in so far as practical. Some drainage features will likely not be recorded due to issues relating to access and complexity e.g., within afforested areas, and extensive turbary areas. Such drainage features, while not mapped or prescribed buffer zones, will be treated with the same consideration as mapped drainage during the design and construction phase of the Development i.e., mitigating for the potential for drainage connection to receiving surface water network.

Groundwater buffer zones are dependent on the characteristics of the receptor e.g., private well, or public supply source protection zone, and the characteristics of the underlying geology and associated aquifer e.g., poor unproductive aquifer, or regionally important karstified aquifer. Recommended groundwater buffer zones range from e.g., 15 m (exclusion zone karst swallow holes) to entire catchments (source protection in regionally important karstified aquifer) depending on site specific characteristics. For the purpose of this assessment the following conservative approach has been applied:

- 100 m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed access tracks and cable trenches i.e., shallow excavation. Source for mapped abstraction points: GSI. Not applicable, none within 100 m of the Site. Applicable to the grid connection and turbine delivery routes.
- 250 m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed borrow pits and foundations. Source for mapped abstraction points: GSI. Not applicable, none within 250 m of the Site.
- There are no source protection areas or karst features in the vicinity of the proposed development.

Some of the Development infrastructure footprint will fall within buffer zones due to the unique and limiting circumstances associated with the Site and the Development, including; constraints related to other environmental disciplines including; ecology, ornithology, etc.; restricted due to the proposed infrastructure itself whereby the proposed turbines require a minimum distance from each other to ensure the potential for wind turbulence impacting on downwind locations is minimised.

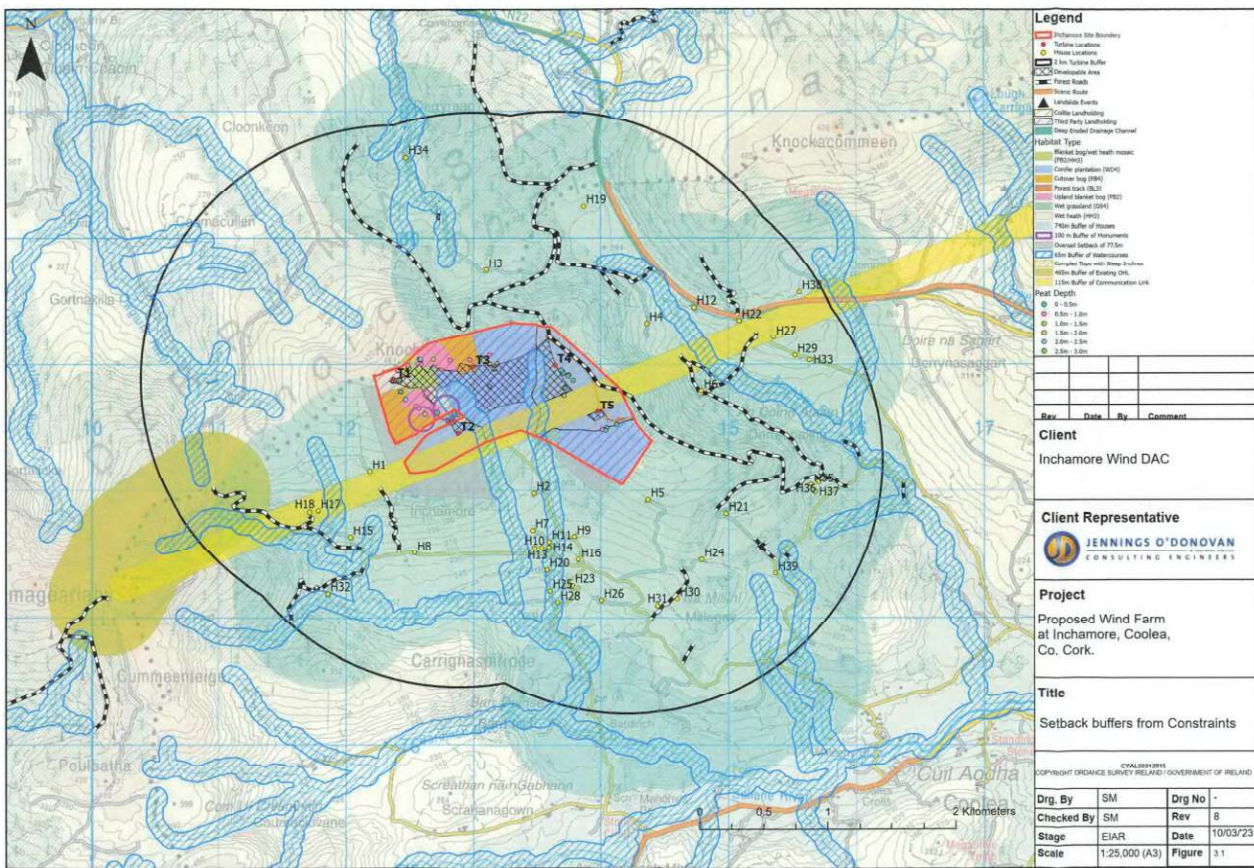


Figure 3.1: Constraints Map

3.4.3 Excavation Works

- The Peat and Spoil Management Plan (**Management Plan 4**) incorporates provision on materials management with a view to establishing material balance (reuse of excavation arisings) during the proposed construction phase, thus minimising the potential for or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff.
- Only temporary stockpiling of spoil will occur during the Construction phase.
- 24-hour advance meteorological forecasting (downloadable from Met Éireann) linked to a trigger-response system will be implemented. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any yellow or greater rainfall warning (>25 mm/hour) issued by Met Éireann), planned responses will be undertaken. These responses will include cessation of construction until the storm event including storm runoff has passed over, assessment of construction areas and infrastructure by Ecological Clerk of Works, and confirmation no additional escalation of response is required. All construction works will cease during storm events such as yellow warning (Met Éireann) rainfall events. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example, dewatering of standing water in open excavations, repair works to drainage features if necessary.
- Exposed soils/peat (exposed temporary stockpiles) will be covered with plastic sheeting during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., weekends, overnight, etc).
- All drainage infrastructure (as per drainage design, **Sections 4 and 5 of Management Plan 3, Surface Water Management Plan**) required for the management of surface water runoff or draining peat ahead of excavation works will be established before excavation works commence.

Excavation Dewatering Mitigation Measures

- Management of excavations, that is: areas of soil / subsoils to be excavated will be drained ahead of excavation works whenever possible, thus reducing the volumes of water encountered during excavation works.
- Engineered drainage and attenuation features will be established ahead of excavation works.

- Earthworks will be limited to meteorologically dry periods and will not occur during sustained or intense rainfall events.
- Dewatering flow rate or pumping rate will be controlled by an inline gate valve or similar infrastructure. This will facilitate reduction of loading on the receiving drainage and attenuation network, thus enhancing the attenuation and settlement of suspended solids.
- All pumped water will be discharged to constructed drainage and in line treatment train or to a vegetated surface through a silt bag outside of surface water buffer zones (**Management Plan 3: Surface Water Management Plan**) or it will be directed or pumped to a settlement tank before being discharged to the receiving drainage network OR pumped to an area of the site where the installation of attenuation features is suitable.
- No extracted or pumped water will be discharge directly to the drainage or surface water network associated with the Site (This is in accordance with The Irish Water Pollution Acts 1977 & 1990 as amended).

3.4.3.1 Construction Water Management, Dewatering, Treatment & Discharge of Trade Effluent

Contaminated water arising from construction works, namely, excavations, drilling and temporary stockpiling, will be contained and treated prior to release or discharge. The schematic presented here is a conceptual model of measures implemented to manage arisings and runoff.

- A. Arisings. Arisings from the launch / reception pit, or any other significant excavation (e.g., cable joint bays), will be directed the treatment train.
- B. Temporary Bund. Arising control area i.e., a temporary bund. Gross solids will be temporarily deposited here. Water arising with the material will be allowed to drain to sump.
- C. Sump / Pump. Sump will discharge by gravity / pumped to stilling pond.
- D. Stilling Ponds. This can be constructed using soils for bunding in combination with an impermeable liner.

- E. Outfall. The outfall from the stilling pond will be buffered (coarse aggregate) to dissipate energy and diffuse discharging water.
- F. Silt Screen. A silt screen will be in place down gradient of the Stilling Pond outfall. This is a precautionary measure to mitigate peak loads or surcharges in the system.
- G. Monitoring Location/s. Discharge quality will be monitored in real time using telemetry systems.
- H. Monitoring of discharge quality will be carried out at the outfall of the stilling pond i.e., before being actually discharged to surface vegetation or surface water (licenced).
- I. Sump / Pump. Discharge By-Pass. If water discharging from the stilling pond exceeds quality reference limits water will be diverted (pumped) from the stilling pond to the settlement / treatment tank. Stilling Pond By-Pass. Similar to Discharge By-Pass, if conditions dictate water can be diverted directly to Settlement / Treatment Tank.
- J. Settlement / Treatment Tank. A settlement tank will in line and ready to use if required i.e., water quality at stilling pond outfall fails to meet quality reference limits. The tank will be equipped with treatment systems which will be activated as the need arises, for example very fine particles which are very slow to settle can be treated with a flocculant agent to promote settlement of particles.
- K. GAC Vessel/s. As a precautionary measure, GAC (Granulated Activated Carbon) vessel/s will be in line and ready to use if required. GAC vessels are used to filter out low concentrations of hydrocarbons. Significant hydrocarbon contamination is only envisaged under accidental circumstances. If a hydrocarbon spill does occur, normal operations will pause and the treatment train will be utilised to remediate captured contaminated runoff.
- L. GAC Vessel By-Pass. If the quality of the water is acceptable in terms of hydrocarbon contamination.
- M. Treated water will be discharge by gravity / pump to the stilling pond for additional clarification, monitoring and buffered discharge to vegetated area.

- N. Silt Bag. A silt bag can be used as alternative to stilling ponds. However, silt bags must only be used as primary method in lower risk areas i.e., outside of buffer zones, etc. Stilling ponds will be the primary method (D, N) in circumstances where risk is elevated, however a gate valve and silt bag can be included in the treatment train and used as an emergency discharge route in the event that the stilling pond needs remediation or maintenance.

In all instances, stilling ponds (D), Silt Bags (N) and outfalls (E) will be situated outside of surface water buffer zones. At many locations, particularly at HDD locations works will be within buffer zones. In these instances, waters can be pumped to the treatment train which can be positioned upgradient along the road (GCR) where discharge to vegetated areas / roadside drains can be managed.

Discharge of non-contaminated storm runoff to vegetated land within a site red line boundary is not a licenced activity however, particularly in relation to the grid connection this methodology is possible only under relatively low flow conditions (e.g., <2 litres per second (L/s) typical of runoff over a relatively small site area. Due to the constricted nature of the grid connection works within public roads, in the event that the expected incoming flow rate or dewatering rate is relatively high (>2 L/s, for example, HDD locations, culvert crossing locations) the water will be removed by suction tanker and brought to a licenced wastewater treatment plant.

The quality of the water being discharged from silt ponds to buffered outfalls will be monitored. If discharge water quality is poor (e.g., >25 mg/L) additional measures will be implemented, for example, pausing works as required and treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped proprietary settlement tank (e.g., siltbuster). Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Site. Silt fences will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced. The discharge area will be outside of 65 m surface water buffer areas (similar to dewatering of excavations). Daily sampling is recommended given the short duration and temporary nature of the works.

Discharging of construction water (trade effluent) directly to surface waters or groundwater is a licenced activity. (This is in accordance with Local Government (Water Pollution) Act, 1977 as amended).

3.4.3.2 Release and Transport of Suspended Solids Proposed Mitigation Measures

- Collector drains and/or soil berms will be established to direct/divert surface water runoff from development areas, including temporary stockpiles, and direct same into established stilling ponds, buffered discharge points or other surface water runoff control infrastructure as appropriate. This is particularly important in relation to plan effectively for surface water management associated with proposed infrastructure within the 65 m surface water buffer zones. The drainage system will be permanent.
- Silt fences will be established along the perimeter of source areas e.g., stockpiles, within the drainage network, and in existing natural drains and degraded peat areas which are likely to receive surface water runoff. This will reduce the potential for surface water runoff loaded with suspended solids to rapidly infiltrate towards and be intercepted by drainage or significant surface water features. Multiple silt fences will be used in drains discharging to the surface water network.
- Silt fences will be temporary features but will remain in place for a period following the completion of the Construction Phase.

Waters arising as a product of excavation activities will be managed as follows:

- Waters arising from dewatering practices during excavation works are highly likely to be significantly loaded with suspended solids. As such, constructed stilling ponds or buffered outfalls may be insufficient in controlling the release of suspended solids to the surface water network, or have the potential to clog due to significant volumes of settled or attenuated solids. Therefore, any water pumped from excavations, or any waters clearly heavily laden with suspended solids will be contained, managed and pumped through the preestablished Active Management treatment train (**EIAR Figure 9.6 – Tile no. 8,9 and 11**). This will include continuous active monitoring of water quality by turbidity measurement on an hourly basis.

Waters (likely loaded with suspended solids) intercepted by the established drainage network will be managed as follows:

- In line Stilling Ponds will buffer the run-off discharging from the drainage system during construction, by retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds are designed to reduce flow velocity to 0.3 m/s at which velocity, silt

particle settlement occurs. Stilling ponds will be permanent (life of development at minimum). The locations of stilling pond have been chosen as a part of the drainage design, refer to **Series 100 Site Layout Plans 6226-PL-100-108** planning drawings. Flow control devices such as weirs and baffles will facilitate achieving better attenuation, particularly when considering fluctuating runoff rates (**EIAR Appendix 9.6 – Tiles 11**).

- In line Check Dams will be constructed across drains and on slopes (**EIAR Appendix 9.6 - Tiles 3 – 6, Section 5.6 of Management Plan 3, Surface Water Management Plan**). Check dams will reduce the velocity of run-off in turn facilitating the settlement of solids upstream of the dam. Check dams will also reduce the potential for erosion of drains. Rock filter bunds may be used for check dams however, wood or straw/hay bales (**EIAR Appendix 9.6 – Tile 13**) can also be used if properly anchored, that is; supported with rock or fitted timber to reduce potential for material to be swept away by incoming water. Multiple check dams will be installed, particularly in areas immediately downgradient of construction areas. Check dams will only be constructed in drainage infrastructure and not in significant surface water features i.e., streams or rivers. Check dams (comprised of rock) established will be permanent. The following will be implemented in the design of check dams and their deployment (CIRA, 2004):
 - Permanent rock filter bunds (coarse aggregate) will be used for check dams however, temporary wood or straw/hay bales can also be used if properly anchored and if the need arises. Permanent rock filter bunds are preferred as this will ensure that rapid surface water runoff is mitigated against for the life of the Development.
 - Permanent rock filter bunds (coarse aggregate) will be used for check dams however, temporary wood or straw/hay bales can also be used if properly anchored and if the need arises. Permanent rock filter bunds are preferred as this will ensure that rapid surface water runoff is mitigated against for the life of the Development.
 - Check dams will be installed at c. 20 m intervals within the length of drainage channels. This is dependent on the slope angle and height of check dams constructed, refer to **EIAR Appendix 9.6 – Tile no. 3**.
 - Check dams will include a small orifice / pipe at the base to allow the flow of water during low flow conditions i.e., maintain hydrological regime during low flow conditions. Note: the use of coarse aggregate will facilitate some infiltration.

- Erosion protection will be established on the downstream side of the check dam i.e., cobbles or boulder (100-150 mm diameter) extending at least 1.2 m (**EIAR Appendix 9.6 – Tile no. 3 and 4**).
- Check dams will be constructed as part of the drain i.e., reduce the potential for bypassing between the drain wall and check dam.
- Further details and design considerations are presented in **EIAR Appendix 9.6 – Tile no. 3 to 6**, refer also to **Section 5 of Management Plan 3, Surface Water Management Plan**.
- Surface water runoff will be discharged to land via buffered drainage outfalls (refer to **EIAR Appendix 9.6 Tiles 7, 8 and 12** see also **Drawing Nos. 6226-PL-301 and 6226-PL-100 to 108 and Management Plan 3, Surface Water Management Plan**). Buffered drainage outfalls will contain hard core material of similar or identical geology to the bedrock at the site to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, removing sediment loading to acceptable levels any adjacent watercourses and avoiding direct discharge to the watercourse. A relatively high number of discharge points / buffered outfalls have been established as part of the design, thus decreasing the loading on any particular outfall. Discharging at regular intervals mimics the natural hydrology by encouraging percolation and by decreasing individual hydraulic loadings from discharge points.
- As per the drainage design (**EIAR Figure 2.6**), buffered drainage outfalls will be located outside of surface water buffer zones. Similarly, outfalls will not be positioned in areas with extensive existing erosion and exposed soils. Buffered outfalls will be fanned and be comprised of coarse aggregate (cobbles / boulders) (**EIAR Appendix 9.6 -Tiles 12 and 13**). These structures will be akin to rip raps (coastal erosion defences/ outfall erosion defences). Silt fences (**EIAR Figure 2.6 and Sections 4 and 5 of Management Plan 3, Surface Water Management Plan**) will be established downstream of buffered outfalls with a view to ensuring the effectiveness of the attenuation train, particularly during elevated flow events. Buffered outfalls established will be permanent.
- Very fine solids, or colloidal particles, are very slow to settle out of waters and the finest of particles require near still water and relatively long periods of time to settle, therefore, such particles are unlikely to settle despite the aforementioned measures. To address this, as required, flocculant will be used to promote the settlement of finer solids prior to redistributing to the treatment train and discharging to surface water networks. Flocculant 'gel blocks' are available and can be placed in drainage channels upstream of stilling ponds. Gel blocks are passive systems, self-dosing and self-limiting, however they still require management (by the Contractor's Environmental Manager and

supervised by the Developer appointed Ecological Clerk of Works (Ecological Clerk of Works (ECoW)) as per the manufacturer's instructions. Flocculants are made from ionic polymers. Cationic polymers (positive charge) are effective flocculants; however, their positive charge make them toxic to aquatic organisms. Anionic polymers (negative charge) are also effective flocculants, and are not toxic i.e., environmentally friendly¹. Therefore, when flocculants are required, the material used must be made from anionic polymer. Gel blocks will be a temporary measure during the construction phase.

- Straw bales (similar to stone check dams) (**EIAR Appendix 9.6 - Tile 13**), and silt fences (discussed under diffuse runoff) can also be used within drainage channels for the purposes of attenuating runoff and entrained suspended solids, however these measures should be considered temporary and will be used mainly in managing potential acute contamination incidents (e.g. additional features to control runoff during excavation works) or to facilitate temporary works (e.g. corrective actions, discussed in later sections). Note; the installation of straw bales or silt fences will require checking on a daily basis by the Contractor's Environmental Manager and supervised by the Ecological Clerk of Works (ECoW) to ensure the bypassing does not occur. Coarse stone / boulders could be used in conjunction with these measures to address such issues.

The above measures, buffer zones, constructed drainage, check dams, two-stage stilling ponds design for attenuation, buffered outfalls are referred to as The Treatment Train, whereby the runoff will continuously be treated from source (construction area) to receptor (site exit, outfall of attenuation lagoon). Where necessary (>25 mg/L suspended solids) the treatment train will be augmented through the use of anionic polymer gel blocks.

These measures reduce the suspended sediment and associated nutrient loading to surface water courses and mitigates potential impacts to water quality and on plant and animal ecologies downstream of the site.

The precautionary and mitigation measures listed here will avoid, reduce or remedy all potential impacts on water quality and will ensure that the sensitive receptors in the catchment of the Development do not suffer any deterioration in water quality, either during construction, operation, or decommissioning.

¹ USEPA (2013) Stormwater Best Management Practice – Polymer Flocculation (Available at: http://www.siltstop.com/pictures/US_EPA_Polymer_Flocculant_Handout_3-14.pdf)

Particularly sensitive areas are identified and presented in **EIAR Figure 9.13a** to inform the drainage design. The drainage design is presented on **Planning Drawings 6226-PL-100 to 6226-PL-108** and calculations are included in **Management Plan 3: Surface Water Management Plan**. The design indicates in detail the locations of treatment train features, and the specification required at each location.

3.4.4 Release of Hydrocarbons Proposed Mitigation Measures

Where fuelling offsite is impractical (e.g., bulldozers, cranes, etc.), and refuelling must occur on site, then a discrete "fuel station" (**Planning Drawing 6226-PL-803**) will be designated with the Contractor's compound for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station will be bunded to 110% volume capacity of fuels stored at the site. The bunded area will be drained by an oil interceptor and drainage of same will be controlled by a pent stock valve that will be opened to discharge storm water from the bund outside buffer zones. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning following construction.

For site cranes, refuelling will take place outside of buffer zones and a drip tray will be used. Spill kits will be available within the refuelling vehicle for any such refuelling activity.

Despite the management of refuelling and fuel storage, there remains the risk of leakage from vehicles and plant equipment during construction activity. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction).

As a precautionary measure, oil (hydrocarbon) absorbent booms will be installed in all surface water features associated with the Development, downstream of each of the proposed construction areas, and at principal surface water features draining the Site. There will be two oil booms installed at each required location, this will facilitate changing out of booms if needed, without facilitating direct flow of floating product during such activities if present. Oil booms deployed will have sufficient absorbency relative to the hazard, for example the volume of fuel in a particular construction vehicle.

In the event of an accidental spill during the construction or operational phase of the Development, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. In this regard, spill

kits will be kept in each vehicle associated with the Development i.e., spill kits will be readily available to all operators. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). No materials, contaminated or otherwise will be left on the Site. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.

Once the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk, and therefore both precautionary measures and emergency response protocols have been established and specified in **Management Plan 1: Emergency Response Plan** and **Management Plan 3: Surface Water Management Plan**.

3.4.5 Release of Cement-Base Products

In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water in the receiving environment, the following precautions and mitigation measures are recommended:

- Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Development where the use of precast concrete will be used include e.g., structural elements of watercourse crossings (single span / closed culverts). Elements of the Development where the use of precast concrete is not possible includes e.g., turbine foundations. Where the use of precast concrete is not possible the following mitigation measures will apply.
- Lean mix concrete, often used to provide protection to main foundations of infrastructure from soil biome, can alter the pH of water if introduced, which would then require the treatment of acid before being discharged to the surrounding environment. The use of lean mix concrete will be minimized, limited to the requirement of turbine foundations. The risk of runoff will be minimal, as concrete will be contained in an enclosed, excavated area.
- The acquisition, transport and use of any cement or concrete on site will be planned fully in advance of commencing works by the Contractor's Environmental Manager and supervised at all times by the Developer appointed Environmental Clerk of Works (EnvCoW). This entails minimising quantities on site, planning delivery routes and washout stations.

- Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on the vehicle which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the Contractor's yard. Vehicles will also be in good working order.
- Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks.
- Concrete will be poured during periods of minimal precipitation. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will involve limiting these works to dry meteorological conditions i.e., avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any foreseen intense rainfall event (>3 mm/hour, yellow on Met Éireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Éireann. This also implies avoiding such conditions while concrete is curing, in so far as practical.
- Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately.
- Pouring of concrete into standing water within excavations will not be undertaken. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the treatment train and buffered surface water discharge systems in place.
- Temporary storage of cement bound sand (if required for construction of the substation building) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g., using sandbags and geotextile sheeting or silt fencing to contain any solids in run-off.
- Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.
- No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately.
- A designated skip(s) will be provided for washing out of concrete chutes. The contents will be allowed to settle and the supernatant will be removed off site by licenced generator to a licenced waste water treatment plant.

3.4.6 Instream Works

The development of the Wind Farm includes the construction of three (3 No.) clear-span bridge watercourse crossings. Please see **Management Plan 2: Water Quality Management Plan** for more details.

- The construction area will be isolated, this means; the water feature (streams / drains) will be temporarily dammed upstream of the watercourse crossing and flow will be diverted by means of a flume / pipe by gravity or pumped (this is referred to as over pumping, **Appendix 9.6 – Tile 1**) downstream of the watercourse crossing and construction area.
- Following the successful upstream damming, a downstream dam or barrier will also be established. The downstream barrier will ensure contaminated runoff in the isolated work area can be contained and managed and will block surface water back flow in lower lying or flatter areas. **Appendix 9.6 – Tile 1** presents a conceptual plan view of an isolated construction area within a surface water feature. Over pumping of a surface water feature is considered diversion of water runoff only and therefore considered similar to discharge of storm water runoff only to sewer (exempt from licensing), however it is imperative that controls are in place to ensure environmental impacts are minimised, particularly in relation to ecological sensitivities.
- In order to ensure isolation and over pumping is carried out effectively, the methodology must ensure that dams are secure / sufficiently supported, and that pumping of water can continue uninterrupted and that pumps are capable of keeping up with the discharge rate of the surface water feature. Pumping systems will require backup and fail-safe protocols e.g., backup pumps and generator. At significant surface water features e.g., non-mapped streams, isolation and diversion of drainage will be implemented.
- Provided the construction water within the isolation area is managed effectively, over pumping of the surface water feature does not pose a significant risk to surface water quality downstream of the watercourse crossing. With reference to **Section 6.4.2 of Chapter 6: Aquatic Ecology**, clear span design of the bridges/crossings (**Management Plan 2: Water Quality Management Plan** will not affect instream aquatic habitat or interfere with the passage of fish or aquatic fauna.
- Water ingress into the construction area will be managed and collected by established sumps immediately downstream of the works (upstream of the downstream barrier) (**Appendix 9.6 – Tile no. 1**). Runoff within the construction area will likely be heavily laden with suspended solids. Where required, dewatering (pumping out or extracting) of such waters will be discharged to an inline settlement tank, or preestablished stilling

pond to remove suspended solids before being discharged (**Appendix 9.6 Tiles 8 and 9**). The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g., >25 mg/L) additional measures will be implemented, for example treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Site (an example is provided in **Appendix 9.6 – Tile 12**). Silt fences (**Appendix 9.6 – Tile 14**), will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced. The discharge area will be outside of the surface water buffer areas (similar to dewatering of excavations). For further details refer to **Appendix 9.6 – Tiles 6 to 9**.

- Discharging of construction water (trade effluent) directly to surface waters is a licenced activity. No extracted or pumped or treated construction water from the isolated construction area will be discharged directly to the surface water network associated with the Site (This is in accordance with Local Government (Water Pollution) Act, 1977 as amended). It is noted that all runoff on the site will eventually discharge to the receiving surface water network, however with appropriate management the quality of runoff discharging to the surface water network will be acceptable e.g., <25 mg/L Suspended Solids.
- Operation of machinery in-stream will be kept to an absolute minimum and avoided where possible. Where in stream works are required, the area will be isolated by means of over pumping or drainage diversion (**Appendix 9.6 Tile 1**), discussed further below.
- Works in relation to watercourse crossings will be carried out during periods of sustained dry meteorological conditions and will not commence if sustained wet conditions or if wet conditions are forecast.
- Works in relation to watercourse crossings will be planned and carried out as efficiently as possible. This means work plans are agreed fully and all equipment and materials are prepared fully before in stream works commence. Works will be completed as quickly as possible and will not pause for the duration of the in stream works e.g., Installation of culverts (24 hour as necessary), with the exception of circumstances related to meteorological and/or health and safety conditions.
- Only precast concrete will be used for in stream works.

A full Schedule of Mitigation Measures relating to Site Drainage can be seen in **Appendix 17.1**.

3.5 Air and Climate

The main potential impact during the construction phase of the Development will be from dust nuisance at sensitive receptors close to the Site. Good practice site procedures will be followed by the appointed contractor to prevent dirt and dust being transported onto the local road network. Good practice site control measures will comprise the following:

- Site Access Roads will be upgraded and built in the initial construction phases. These roads will be finished with graded aggregate which compacts, preventing dust.
- Approach roads and construction areas will be cleaned on a regular basis to prevent build-up of mud and prevent it from migrating around the Site and onto the public road network.
- Wheel wash facilities will be provided near the Site entrances to prevent mud/dirt being transferred from the site to the public road network.
- Public roads along the construction haul route will be inspected and cleaned daily. In the unlikely event that dirt/mud is identified on public roads, the roads will be cleaned. The wheel wash facility will be investigated, and the problem fixed to prevent this from happening again.
- During periods of dry and windy weather, there is potential for dust to become friable and cause nuisance to nearby residences and users of the local road network. This requires wetting material and ensuring water is supplied at the correct levels for the duration of the work activity. The weather will be monitored so that the need for damping down activities can be predicted. Water bowsers will be available to spray work areas (wind turbine area and grid connection route) and haul roads to suppress dust migration from the Site.
- Vehicles delivering materials to the site will be covered appropriately when transporting materials that could result in dust, e.g., crushed rock or sand.
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery.
- All machinery when not in use will be turned off.
- Ready-mix concrete will be delivered to the Site and no batching of concrete will take place on the Site. Only washing out of chutes will take place on site and this will be undertaken at a designated concrete washout facility at the contractor's compound. The concrete wash water will be disposed of at a licensed facility as outlined in **Management Plan 5: Waste Management Plan**.

- Speed restrictions of 15 km/h on access roads will be implemented to reduce the likelihood of dust becoming airborne. Consideration will be given to how on-site speed limits are policed by the Contractor and referred to in the toolbox talks.
- Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind. Stockpiles will be covered with geotextiles layering and damping down will be carried out when weather conditions require it.
- Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable.
- An independent, qualified Geotechnical Engineer will be contracted for the detailed design stage of the project and geotechnical services and will be retained throughout the construction phase, including monitoring and supervision of construction activities on a regular basis. The methodology statement will be signed off by a suitably qualified Geotechnical Engineer.
- A complaints procedure will be implemented on site where complaints will be reported, logged and appropriate action taken.

It is considered that the Development will have no potential significant effects, given the mitigation measures embedded in the design and recommended for the implementation of the Project.

The Project will assist Ireland in meeting a 51% reduction in overall greenhouse gas emissions by 2030. Also, it will aid in increasing the onshore wind capacity, as per the Climate Action Plan 2023 (CAP2023). The CAP 2023 commits Ireland to installing up to 8 GW of onshore wind capacity by 2030, in order to support the reduction in Ireland's greenhouse gas emissions.

All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.

3.6 Archaeology and Cultural Heritage

The mitigation measures presented in this section comprise construction phase archaeological monitoring of ground works as well as protection measures for known and potential cultural heritage assets within the Site. These mitigation measures are in accordance with guidelines for planning conditions for wind energy developments within close proximity to recorded archaeological monuments as published in Section 7.4 of the

2006 Wind Energy Development Guidelines² and Section 7.6 of the 2019 Draft Revised Wind Energy Development Guidelines³.

3.6.1 Mitigation

Construction Phase

- Ground works during the construction phase will be subject to archaeological monitoring by a suitably qualified archaeologist under licence by the National Monuments Service. A systematic advance programme of archaeological field-walking surveys will also be carried out within Development areas in forestry plantations following tree felling to confirm the conditions predicted in this assessment, i.e., that they contain no visible surface traces of potential unrecorded archaeological or architectural heritage sites.
- In the event that any sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may include preservation *in situ* (by avoidance) or preservation by record (archaeological excavation). Any identified sub-surface archaeological features which will be preserved by avoidance will be securely cordoned off for the duration of the construction phase and clearly signed as a 'No Entry: Archaeological Area'.
- The archaeologist appointed to monitor the construction phase will also supervise the establishment of minimum 30 m radius concentric buffer zones around the external-most elements of Field Boundary (CO057-006---) and Enclosure (CO057-007---). These buffer zones will be securely fenced off and their locations will be clearly signed as 'No Entry' for the duration of the construction phase. No ground works of any kind (including but not limited to advance geotechnical site investigation) and no machinery, storage of materials or any other activity related to construction will occur within these buffer zones. The location of a derelict farm building, which shown on the second edition 6-inch OS map (published 1900), is c.110 m outside the nearest construction area within the Site. This will be clearly signed as "No Entry" during the construction phase. The locations of these onsite archaeological monuments and farm building will also be identified as 'no-entry' areas during the construction phase site inductions. The location of two features located c.40 m to the north of T2, which are tentatively identified as being of archaeological potential (hut site and upright stone), are located in private lands outside the Redline Boundary. The erection of fencing around their locations will

² <https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/>

³ <https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/>

therefore not be feasible but, "No Entry" signs will be erected at the north, south and east edges of the Redline Boundary within their environs.

- The Project is located within the Múscraí Gaeltacht area and any signage erected within the public realm during the construction phase will include Irish and English text.

3.7 Noise & Vibration

No significant construction noise effects have been identified. Therefore, no specific mitigation measures are required. However, general guidance for controlling construction noise through the use of good practice given in BS 5228 will be followed. During construction of the Development, activity shall be limited to working times incorporated in any planning permission.

3.8 Traffic

The following mitigation measures are recommended:

- A Traffic Management Plan (TMP) has been developed (see Management Plan 7 attached to the CEMP). Prior to construction and once the Contractor's have confirmed their suppliers, the TMP will be updated in consultation with Cork County Council, Kerry County Council and An Garda Síochána as necessary to take account of any conditions attached to a grant or permission. All drivers will be made aware of the location and presence of sensitive receptors at an induction session prior to construction activities taking place and will be made aware of the speed limits of the various roads on the route which are contained in the TMP and on the traffic arrangements for entering and exiting the site. This is to ensure compliance with speed limits, and traffic management arrangements.
- At the forest junction at the N22 (wind farm access) bitumen macadam surface will be provided some 30 m into the junction with room to park HGV's clear of the N22.
- The forest access track will be regraded so as to reduce the gradient towards the N22. An "Aco" type drain shall be provided to intercept rainfall run-off.
- All the traffic to the wind farm site will approach from the east such that they turn left at the forest access. All traffic leaving the wind farm site will turn left only and, if required, can turn around at Cummeenavrick. Signage and road markings will be provided to facilitate/promote these manoeuvres.
- The new N22 Macroon By-Pass will be used to transport turbine components, materials for upgrading the turbine haul route, materials for construction of the civil and electrical works to and from the wind farm site, as well as materials for the grid connection so as to minimise traffic through built-up areas such as Macroon, Ballymakeery and Ballyvourney.

- All significant traffic likely to be generated by Inchamore Wind Farm will be during the construction of the development and will be temporary in nature. It is envisaged that the construction period for the wind farm will span a 21-month period with the underground cable being installed over a concurrent 12-month period. The construction-phase Traffic Management Plan will mitigate these impacts. A number of mitigation measures are embedded within the design:
 - The design is such as to minimise the extent of the new build requirement by using existing forestry tracks where possible, thereby minimising materials requirements.
 - The design is such as to maximise the use of onsite resources (particularly stone material for track construction) to minimise the requirement for material import. Some 49,842 m³ of stone is proposed to be won from the borrow pit which equates to a 4,154 HGV trips to the site avoided (see **Chapter 2: Table 2.4a**).
 - Retaining surplus excavated material on the Site so as to reinstate the borrow pits, thereby eliminating traffic associated with the disposal of same. Some 50,276 m³ of spoil are proposed to be stored in the on-site borrow pit or in roadside berms, resulting in a saving of 4,190 HGV trips off the site (see **Chapter 2: Table 2.4b**).
 - Designing the cable for installation in pre-laid ducts, rather than directly installing the cable in the ground. The latter would require the entire trench from joint bay to joint bay to be fully open for cable laying.
- Use special transporter vehicles with rear wheel steering in delivery of wind turbine components to ensure safe transportation and manoeuvrability on the roads. Extendable transporter vehicles will be retracted on return journeys.
- Prior to the delivery of abnormal loads i.e., turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Cork and Kerry County Council Roads Departments to discuss the requirement for a Garda escort.
- The Developer will confirm the intended timescale for abnormal deliveries and every effort will be made to avoid peak times such as school drop off times, church services, sporting events, peak traffic times where it is considered this may lead to unnecessary disruption.
- Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the relatively modest distance between Ringaskiddy Port and the Site of c.92.8 km, the journey is achievable within a 2-3 hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries.

- A condition survey of the existing N22 between Cummeenavrick and the Ballyvourney Junction of the Macroom Bypass will be carried out prior to commencement of construction and another will be undertaken post-construction. The Developer will lodge a bond with Kerry County Council and or Cork County Council prior to commencement of construction in the amount to be agreed with the respective Council for the possible repair/upkeep of the road. During the construction period, the road will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any defects within the following week. At the end of the construction period, any further defects will be remedied to the satisfaction of Kerry County Council, Cork County Council and Transport Infrastructure Ireland.
- Wheel cleaning equipment will be used at the exit from the wind farm Site at Derryreagh and also at the exit from the Grid Connection Works at Cummeenavrick to prevent any mud and/or stones being transferred from Site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the construction Site.
- The two Site entry points will also be appropriately signed. Access to the wind farm construction Site will be controlled by on Site personnel and all visitors will be asked to sign in and out of the Site by security / Site personnel on entering and exiting the Site. All Site visitors will undergo a Site induction covering Health and Safety issues at the Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite.
- Any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed.
- To reduce dust emissions, vehicle containers/loads of crushed stone will be covered during both entrance and egress to the Site.
- A survey of the turbine component haul route will be undertaken prior to commencement to identify if any new overhead lines or broadband lines will need to be raised along the route to allow abnormal loads such as tower sections and nacelles to be delivered.
- During the construction phase, clear construction warning signs will be placed on the N22 as necessary, which will advise road users of the presence of a construction Site and of the likelihood of vehicles entering and exiting the Site or road construction areas. This will help improve road safety.

- Works on public roads on the turbine delivery road and grid connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8- Temporary Traffic Measures and Signs at Roadworks".
- Where required, i.e., Road Opening Licence will be obtained for the directional drill of the grid connection under the N22.
- All vehicles using or while in operation at the wind farm site shall either have roof mounted flashing beacons or will use their hazard lights.
- A speed limit of 25 km/h shall apply to all vehicles within the wind farm site.

3.8.1 Diversion Routes

The Site is generally served by the N22 which runs between Cork City and Tralee. The N22 is approximately 0.9 kilometres (km) to the north-east of the Site and has a speed limit of 100 km/h (kilometres per hour).

Receptors considered as having 'high' sensitivity are primarily premises which are directly on the N28, N40 and N22 which already have significant potential to generate traffic.

3.8.2 Delivery Volume for Construction Materials

Table 3.1: Traffic Volumes for Wind Farm Site Infrastructure

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	10 no.	10
Concrete	4,860 m ³	810
Reinforcing Steel	500 t	25
Substation Building and electrical equipment	-	20
Other – Geotextile Mats, Tools, Fencing etc.	-	30
Internal Cabling Materials incl. bedding	-	91
Met Mast Materials	-	4
Imported Crushed Stone (engineering fill) as Uphill to Foundations	766 m ³	389
Imported Crushed Stone for Substation, 200 mm thick	233 m ³	12
Imported Crushed Stone for Site Access Track and Turbine Hardstands (assumes 100 mm thick wearing course)	4,670 m ³	389
Forestry Removal	11,140 m ³	300
Site Reinstatement	-	5
Waste – 1 container/month	-	21
Total	-	1,781

Table 3.2: Traffic Volumes for Turbine Components

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	10	10
Anchor Cages & Foundation Templates	5	5
Tower Sections	-	20
Nacelles	5	5
Rotor Blades	15	15
Transformers, Panels and Cabling	-	3
Tools etc.	-	1
Crane Deliveries to Site, including ballast, booms, etc. and removal of same	2 Cranes	50
Road Widening on Turbine Haul Route N22 Forest Access – Soil Disposal	500 m ³	25
Crushed Stone for Widening and Strengthening of Turbine Haul Route at N22 Forest Access	400 m ³	20
Road Surfacing for Turbine Haul Route at N22 Forest Access	200 t	10
Fencing and Miscellaneous Deliveries to N22 Forest Access	2	2
Total		166

Table 3.3: Traffic Volumes for Grid Works

Length of Grid Connection in Roads by Directional Drill	650		
Length of Grid Connection in Tracks, Lands	19,200		
Number of Joint Bays	18		
Materials	Quantity	Unit	No. of Deliveries
Site Establishment and Removal	8	No.	8
Concrete Blinding for Joint Bays, Comms Chambers and Link Boxes	20	m ³	4
Concrete for Floors of Joint Bays	51	m ³	9
Pre-Cast Concrete Joint Bays and Communication Chambers	20	No.	20
Other – Steel mesh, Geotextiles, Silt Fencing, Fencing, Danger Tape, etc.	4	No.	4
Grid Connection Cables	381	t	20
Grid Connection Ducting	80	km	27
Disposal of Excavated materials from Directional Drill Trenches in Public Roads	30	m ³	2
Lean Mix Concrete for Trenches	5,597	m ³	932
Total No. of Deliveries	-	-	1,026

3.8.3 Site Entrance

There is one proposed Site entrance to the Development.

A wheel wash facility will be provided near the Site entrance so that the wheels of vehicles exiting the Site can be cleaned prior to exiting onto the public road. This will be carried out under the supervision of the Site Health & Safety manager and in accordance with the agreed

Traffic Management Plan (Management Plan 7) to ensure that it is undertaken in a safe manner.

3.8.4 Construction Material Haul Route

The haul route of quarry materials i.e., readymix concrete will be established after the appointment of the Contractors, but it is envisaged that material will be sourced from quarries local to the Site to minimise disruption on the public road network as per **EIAR Figure 15.3**.

From Keim, trucks will follow the R582 in a south-easterly direction and join the New Macroom By-Pass (N22) at Gurteenroe Junction. They will then follow the new N22 By-Pass to Ballyvourney Junction and then the existing N22 to Derryreag to access the forest track in the Site.

For the quarries to the south, trucks would use the R587, then the R584 to the existing N22, proceed south-westwards to the Coolcour Junction of the Macroom By-pass, proceed north-westwards along the bypass to the Ballyvourney Junction with existing N22, follow existing N22 westwards to the forestry entrance at Derryreag and then turn left and follow the forest track to the wind farm site or to the grid connection on the southern side of the N22.

3.9 Waste

The following section details the environmental control measures which will be incorporated into the Development in respect of Waste Management.

3.9.1 Mitigation

- The Contractors will avoid or minimise the volume of waste generated.
- Waste will be stored a minimum of 65 m from nearby watercourses or drains at the Development.
- Waste storage and disposal will be carried out in a way which prevents pollution in compliance with legislation.
- Rainwater, which has collected within bunded areas used for the storage of oils, chemicals and waste, will be collected and disposed offsite by suitably qualified waste Contractors.
- Waste derived from the port-a-cabins (office and canteen facility) onsite will be placed in an appropriately designed waste storage area prior to collection a licensed Contractors under the Waste Management Act, 1996 (as amended).

- Port-a-loos will be regularly maintained by a suitably qualified waste Contractors engaged by the supplier.
- The wheel cleaning facility is proposed at the Site entrance; in addition, a track sweeper may be used.
- All waste to be transported off-site to a licensed facility will be documented in accordance with the European Union (Waste Directive) Regulations 2020. An adequate description of the waste and where it came from will be given and an appropriate European Waste Catalogue Code and Standard Industrial Classification Code will be provided. The quantity and nature of the waste will be described and how it is contained. Personal details of the waste transferor and transferee at the Development will be documented. Waste will only be transferred by registered/licensed and competent person(s).
- Only trained operatives will handle hazardous substances. All stored hazardous waste will be clearly labelled.
- All oil storage facilities of over 200 litres need secondary containment facilities of 110% storage capacity (e.g., bund, enclosure, drip tray). All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g., a drip tray full of rainwater.
- Waste storage areas will be clearly located and signed. If space allows, key waste streams will be separated.
- All waste will be transported from the Site at appropriate frequency by a registered waste Contractors to prevent over-filling of waste containers.
- Frequency of Checks. The Contractors will ensure that all storage facilities are checked on a weekly basis. The checklist for completion is attached in **Management Plan 5: Waste Management Plan**.

3.10 Construction

The following sections detail an outline construction sequence to provide an overview of the construction process; The construction-stage details of the sequence and methodologies, to be undertaken within the framework of this CEMP, will be determined by the Contractors.

3.10.1 Phasing of Works

It is envisaged that the following will be the sequence of construction for the Development:

1. Site Preparation including felling and drainage
2. Site Access Roads
3. Contractors Compound and Welfare Facilities

4. Crane hardstandings
5. Turbine Foundations
6. Internal cable ducting
7. Installation of the Grid Connection
8. Erection of wind turbines
9. Commissioning and Energisation

3.10.2 Working Hours

The Development will have approximately 25 construction workers during the peak of the construction phase. Working hours for construction will be from 07:00 to 19:00 on weekdays, with reduced working hours at weekends, from 07:00 to 13:00 on a Saturday. It should be noted that during the turbine erection phase, operations will need to take place outside those hours with concrete pours commencing at 05:00 and continuing till 16:00, to facilitate turbine foundation construction and so that lifting operations are completed safely. Hours of working for turbine foundation construction will be agreed with Cork County Council prior to the commencement of turbine foundation construction. **Chapter 15: Traffic and Transportation** refers to this in further detail. A detailed Traffic Management Plan (**Management Plan 7**) will be implemented for the construction phase. This shall be agreed during the planning compliance stage with the Planning Authority so that strict controls described therein are in place with all suppliers coming to the Site.

3.10.3 Site Management Procedures and Construction Methodologies

Prior to commencement of construction, the appointed Contractors(s) will prepare detailed method statements and work programmes for the construction stage. These method statements will be prepared in the context of measures set out in this CEMP and will take account of mitigation measures as outlined in the planning application and accompanying environment reports, and site investigations to be carried out prior to construction. Any specific requirements will be fully incorporated into the appointed Contractors scopes of work and appropriate supervision and management will be carried out to ensure full compliance.

The method statements produced by the Contractors(s) will be reviewed by the Ecological Clerk of Works (ECoW) and will be agreed with the appropriate parties, including Cork County Council and Kerry County Council. The developer will employ a project manager to monitor the construction phase of the Project and ensure works are being carried out in accordance with the agreed method statements, safety procedures and pollution control measures.

3.10.3.1 Mobilisation of Contractors Plant

Prior to commencement of construction works, the selected Contractors shall submit to the Developer a full list of plant, equipment and accommodation (site offices etc.) proposed for use during the works.

Dates for mobilisation will be agreed with the developer and/or his representative/Owners Engineer.

3.10.3.2 Site Infrastructure

Site Access Roads / Turbines

Machinery and vehicles used in access track construction are operated from the track only as it is constructed.

The location of all infrastructure required for this Development shall be set out by GPS (Real-Time Kinematicenabled⁴) equipment to the permitted detail as noted on the approved drawings. The Site will be set out using wooden posts to mark the boundary and extent of construction activities, in accordance with the Site layout and environmental constraints drawings, and with contributions from the appointed ecologist. The boundaries of the buffer zones will be taped/fenced off to prevent construction plant from entering the buffer zones and impacting on water quality. Site personnel will be informed of the buffer zones through toolbox talks onsite, both before and during construction. New personnel will be informed of the construction buffer zones with induction training before commencing work.

Borrow Pit

Most of the crushed stone fill material for site track and hardstand areas will be sourced from the permitted borrow pit outlined above.

The rock will be extracted from the proposed borrow pit using two main methods, rock breaking and rock blasting. The primary method will be rock breaking. Rock sourced from the proposed borrow pit will be used for the roads and hardstanding areas. The borrow pit will operate for the duration of the construction period of the site infrastructure.

⁴ Real-time kinematic (RTK) processing on a drone records GPS information and geotags images as they're captured during flight.

The effects of blasting vibration and air overpressure from the Development is at distances greater than 610 m and is therefore considered not significant and will be kept well within the recommended EPA guidance value of 125 dB (lin) (and those described in **Chapter 11: Noise**).

3.10.3.3 Establish Pre- Commencement Mitigation Measures

Prior to construction works advancing on site, the Contractors shall confirm to the Employer of their intention to advance the works in a sound practical manner with no undue impact on the receiving environment. The Contractors shall identify all sensitive environmental areas within the Employer's site and confirm their intended method of construction works regarding these areas in line with the methods outlined in this CEMP. All environmentally sensitive areas shall be identified prior to the detailed design/construction phase.

Where the estimated working area is reduced by any sensitive environmental areas i.e., buffer zones, post and tape marking shall be used to set out these locations and thus prevent the entry of Contractors plant within these areas during construction works.

To protect any known ecological features that occur close to the planned infrastructure, a delineated working corridor will be employed throughout the construction. Posts and tape will be used to establish these areas and thus prevent the entry of Contractors plant outside the working corridor during construction works. Locations of ecological significance or where invasive species are identified will also be fenced off.

A 65 m buffer to natural watercourses will be employed during construction to protect water quality and to see that there is no significant direct effect on existing watercourses. The proposed locations for spoil storage are highlighted in **Management Plan 4: Peat and Spoil Management Plan**. Where spoil storage areas are located in proximity to watercourse buffer zones, silt fencing will be installed along the area facing the buffer zone and maintained in line with the instructions of the manufacturer. Works within the buffer zone will be subject to specific method statements.

3.10.3.4 Site Preparation

Entrance Formation

From Ringaskiddy Port, County Cork, turbine nacelles, tower hubs and rotor blades will be transported to the N22. They will then turn around towards the Site along an existing Access Track (Site entrance).

Turbine components and construction materials will use the same route and site entrance.

Please refer to **Figures 3.2** for an illustration of the Site entrance location.

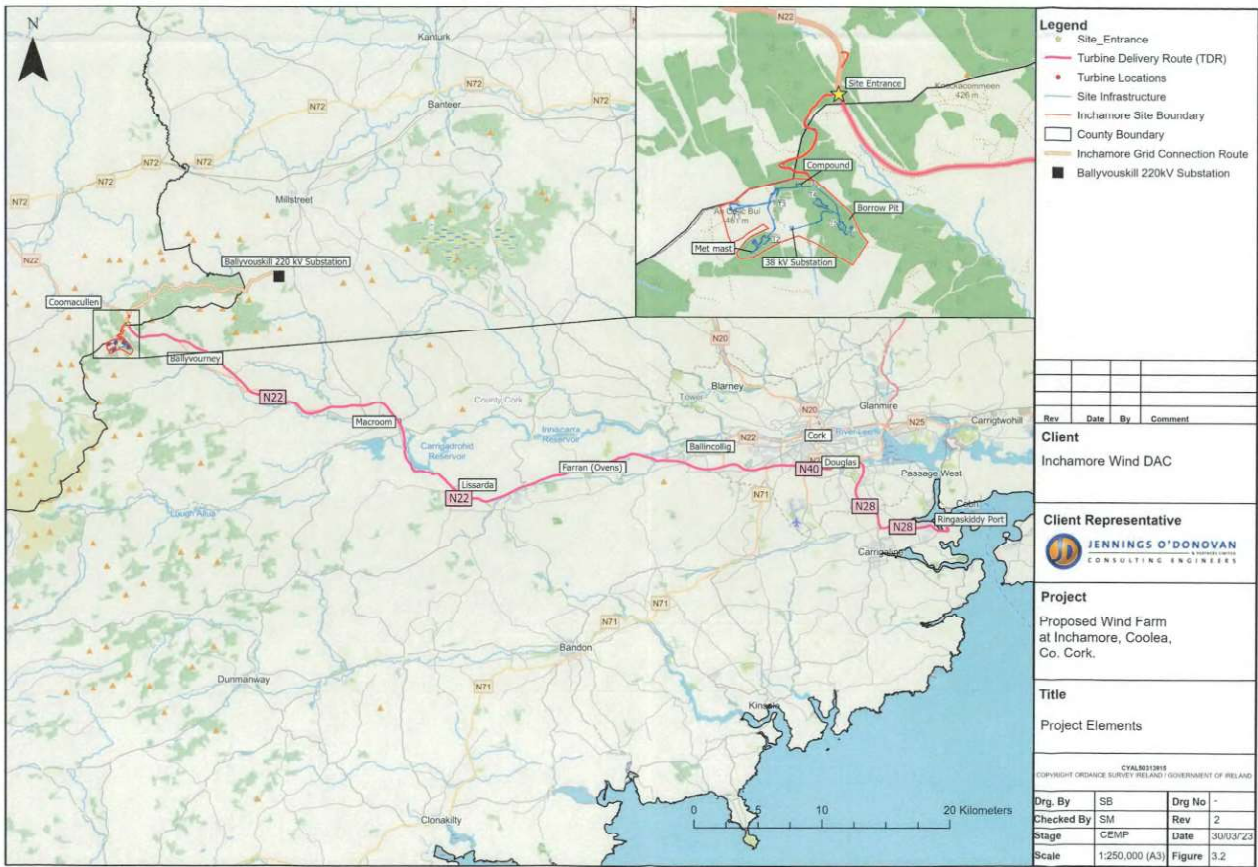


Figure 3.2 Map showing the proposed location of the site entrance at Inchamore Wind Farm.