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CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

BALLINAGREE WIND FARM

ENVIRONMENTAL IMPACT ASSESSMENT – SCOPING REPORT

Prepared for: Coillte and Brookfield

COILLTE
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Brookfield

Date: June 2020

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ENVIRONMENTAL IMPACT ASSESSMENT – SCOPING REPORT

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Abstract: This is a scoping report prepared for a proposed wind energy development near Ballinagree, County Cork. The purpose of the scoping report is to identify the content and extent of the information to be provided in the Environmental Impact Assessment Report for the proposed project.

Please send all responses to: ballinagreewindfarm@ftco.ie

or respond by post to:
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Core House,
Pouladuff Road,
County Cork

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1. INTRODUCTION

1.1 General

1.1.1 Introduction

Coillte Renewable Energy (Coillte) in partnership with Brookfield Renewable Ireland Limited (Brookfield Renewable) intend to apply for planning consent for a renewable energy development referred to as the Ballinagree Wind Farm, located in North West County Cork, near the town of Ballinagree. The proposed Ballinagree Wind Farm project includes lands contained within the following townlands: Annagannihy, Ballynagree East, Ballynagree West, Carrigagulla and Knocknagappul.

A site location map is included in Figure 1-1

A number of grid connection options are currently being considered in order to supply power from the proposed development to the Irish National Electricity Grid. It is proposed to construct a new substation on-site and connect by underground cable to either the Clashavoon 220kV substation or the Ballyvouskill 220kV substation, subject to consultation with Eirgrid.

1.1.2 The Proposed Development

The proposed development is located within the jurisdiction of Cork County Council, approximately 35km north west of Cork City. The project is located approximately 8km south east of Millstreet and approximately 10km north of Macroom.

The Study Area for the proposed development initially provided scope for up to 24 Wind Turbines. Following further project assessments as part of the Design Iteration 1 process, the project team is currently considering a Study Area for a 19 Wind Turbine layout. The 19 Wind Turbine layout will consist of turbines with a tip height of up to 185m. The current project layout (Design Iteration 1) is presented in Figure 1-2.

The proposed development is further detailed in section 2.1 of this report.

Several possible grid connection arrangement options are being considered to connect the project to the national grid. The preferred connection is likely to be an underground cable connection to the Clashavoon 220kV substation or the Ballyvouskill 220kV substation, subject to ongoing consultation with Eirgrid. These grid route options are illustrated in figure 2-1. The potential grid route options are at an early stage of consideration and may be subject to change.

The townlands associated with an underground grid connection to the Ballyvouskill 220kV substation option include Ballynagree West, Knocknagappul, Rahalisk, Maulnahorna, Cusloura, Knocknakilla, Glantane East, Carrigacooleen and Caherdowney (Option A of Figure 2-1).

The townlands associated with an underground grid connection to the Clashavoon 220kV substation option include Ballynagree West, Lacknahaghny, Caherbaroul, Kilberrihert, Derryroe and Aughinida (Option C of figure 2-1)

1.1.3 The Applicant

The applicants for the proposed project are Coillte Renewable Energy and Brookfield Renewable.

Coillte manages approximately 7% of Ireland's land. Coillte Renewable Energy are responsible for harnessing the wind energy above Coillte forests. We aim to build responsible projects in a way that is good for us, for society and our neighbours. Coillte is currently working toward our aspiration of adding a further 1GW of wind energy generation capacity over the next ten years, driving Ireland's ambition toward 70% renewable electricity by 2030.

Brookfield Renewable Ireland is one of the largest owners and developers of renewable assets in Ireland holding 10 % of the operating wind farms in Ireland, employing approximately 100 people in Cork and across their Irish wind farms. Brookfield's development pipeline will continue to bring new renewable energy onto the system further contributing to decarbonisation of the Irish economy.

1.1.4 Purpose of the Report

This is a scoping report prepared for the EIAR for the proposed Ballinagree Wind Farm in north west Co. Cork.

The purpose of the EIA scoping process is to identify the key points and issues which are likely to be important during the environmental impact assessment (EIA) and to eliminate those that are not. The scoping process identifies sources or causes of potential environmental effects, the pathways by which the effects can happen, and the sensitive receptors, which are likely to be affected. It defines the appropriate level of detail for the information to be provided in the EIAR. In essence, the primary focus of scoping is to define the most appropriate assessment of significant effects related to the proposed development.

This scoping report has been distributed to a range of stakeholders who are considered to have appropriate expertise and relevant prior experience of the factors involved, knowledge of the characteristics of the project type and of the sensitivities likely to be present in the receiving environment as well as local knowledge and interest in the area. The scoping report will also be made available to individual stakeholders and the public on request.

A full list of the scoping consultees is included in Appendix A of this document.

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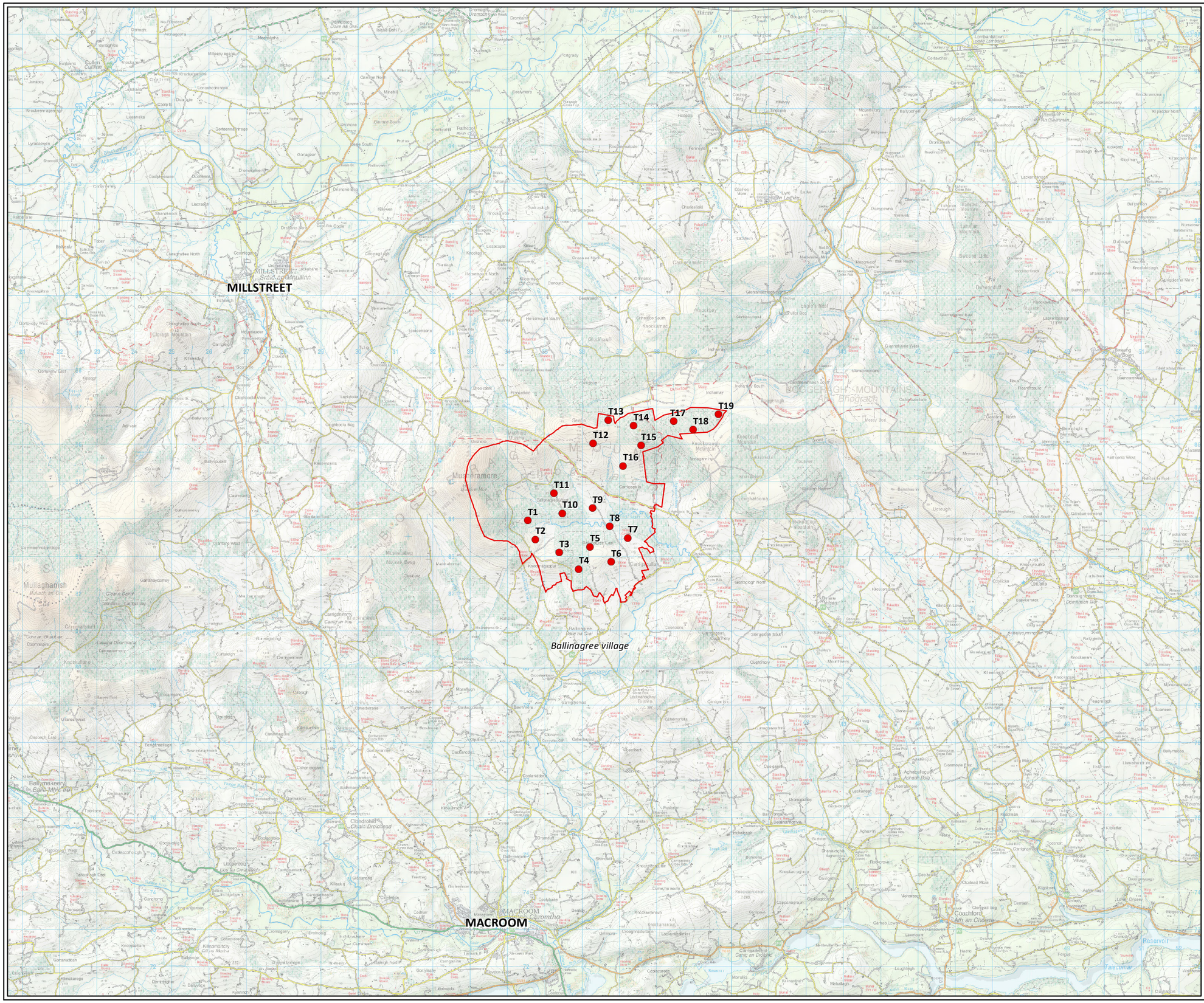

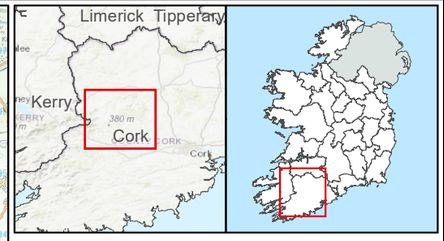

- Proposed Turbine Layout
- Site Boundary

N W E S

0 1 2 4 Kilometers

TITLE:	Site Location		
PROJECT:	Ballinagree Wind Farm		
FIGURE NO:	1.1		
CLIENT:	Coillte & Brookfield		
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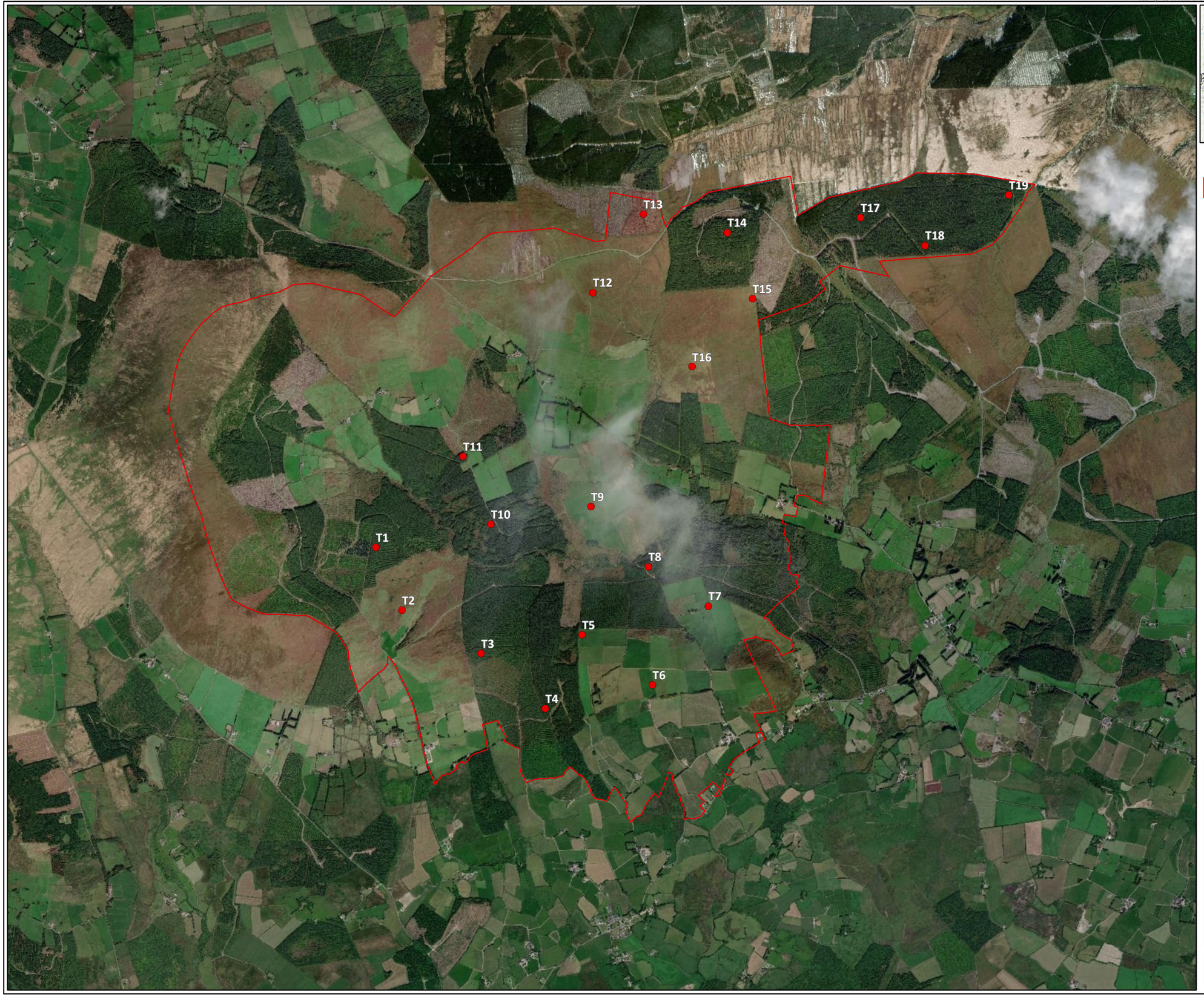

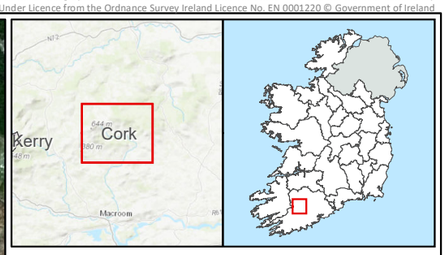

Proposed Turbine Layout

Site Boundary

N
W E
S

0 0.5 1 2 Kilometers

TITLE:	Site Layout		
PROJECT:	Ballinagree Wind Farm		
FIGURE NO:	1.2		
CLIENT:	Coillte & Brookfield		
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DATE:	17/06/2020	**PAGE SIZE:**	A3

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1.2 Planning Process for Proposed Development

It is intended that the proposed development will be submitted for planning directly to An Bord Pleanála pursuant to the Strategic Infrastructure Development Act 2006 (as amended), subject to a pre-application consultation process with An Bord Pleanála.

The Planning and Development Act 2000 was amended in 2006 to require certain applications for permission for major infrastructure projects to be made directly to An Bord Pleanála, rather than to the local planning authority, as would have previously been the case. This is known as Strategic Infrastructure Development (SID).

In order to qualify for SID under section 37B of the Planning and Development Act 2000 (as amended), a proposed development must fall within of a class specified in the Seventh Schedule to the 2000 Act. Part 1 of the Seventh Schedule, as amended, specifies, inter alia, the following classes of development:

> "An installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 megawatts."

Thereafter, the Board must satisfy itself that the proposed development meets one or more of the conditions set out in subsection 37A(2) of the 2000 Act, namely—

> "(a) the development would be of strategic economic or social importance to the State or the region in which it would be situate,
>
> (b) the development would contribute substantially to the fulfilment of any of the objectives in the National Spatial Strategy or in any regional spatial and economic strategy in force in respect of the area or areas in which it would be situate,
>
> (c) the development would have a significant effect on the area of more than one planning authority."

The proposed development layout currently being considered (Design Iteration 1) has a potential capacity of up to 80 MW, therefore qualifying as SID under Part 1 of the Seventh Schedule of the Planning and Development Act 2000, as amended. A pre-application consultation request for Strategic Infrastructure Development was submitted to An Bord Pleanála under reference PL28 .306948 in March 2020.

1.3 Environmental Impact Assessment and the Function of the EIAR

Under Section 172 of the Planning and Development Act, as amended, a planning application for a development which comes within a class of development specified under Schedule 5 of Part 2 of the Planning and Development Regulations must be accompanied by an Environmental Impact Assessment Report (EIAR) in accordance with the 2014 Directive. Accordingly, as the proposed development will have more than 5 no. turbines and a generating capacity of greater than 5MW, an EIAR will be prepared for the project in accordance with the Planning and Development Regulations 2001 (as amended).

The purpose of an EIAR is to provide a detailed description of the proposed development and outline potential impacts associated with the construction and operation of the project. Where adverse impacts have been identified, mitigation measures are proposed, and the residual impacts described.

1.4 Contribution to the EIAR

This Scoping Report has been prepared by Fehily Timoney & Company (FT) on behalf of Coillte and Brookfield Renewable. FT is a planning, environmental and engineering consultancy based in Cork, Dublin and Carlow, specialising in civil and environmental engineering, environmental science and planning. FT is well established as a leading consultancy in wind farm development in Ireland.

FT will be designing and preparing the Environmental Impact Assessment Report for submission to An Bord Pleanála as described in Section 1.2 above.

Specialist contributors to the EIAR include:

- Macro Works who will prepare the landscape and visual impact assessment;
- John Cronin & Associates who will prepare the Cultural Heritage assessment; and
- Ecology Ireland who will be preparing the ecology assessment.
- Triturus Environmental who will be preparing an aquatic ecology assessment.

1.5 Consultation

The stakeholder consultation process is being carried out in accordance with the Code of Practice for Wind Energy Development in Ireland-Guidelines for Community Engagement (available at: www.dccae.gov.ie).

Comments on the scope of the EIAR can be submitted by email to ballinagreewindfarm@ftco.ie or returned by post to Fehily Timoney & Company, Core House, Pouladuff Road, County Cork. We ask all consultees to submit responses by the **3rd of August 2020** to provide adequate time to consider all responses.

Project Website

A project website has been set up to inform the public of the project (www.ballinagreewindfarm.ie). The website is being used to notify members of the public of project updates, project timelines, upcoming public consultation and any changes in the design and layout as a consequence of consultations. It also provides an avenue for the public to contact the project development team directly and includes design updates in the 'Latest News' section.

Community & Stakeholder Consultation

Door to door consultation with community members located within 3 km of the proposed development began in Summer 2019 with the aim of facilitating discussion of the project with local residents. Two dedicated Community Liaison Officers (CLOs) have been appointed and, along with the Coillte and Brookfield Renewable Project Managers, are available for calls and meetings with members of the public.

As the design process progresses, one-to-one meetings will be ongoing with update newsletters distributed in the local area to provide clear information on the main aspects of the project as it evolves. The third project newsletter for distribution to the public is included in Appendix B of this report. The project website also displays up to date information and continues to evolve with the project to provide a source of up-to-date information as the project progresses.

Other stakeholders have been contacted at the outset of the project including local TDs and Councillors, local environmental groups, business groups, recreation clubs, the local Garda branch, and community action and development groups.

Local Authority Consultation

A pre-planning meeting was held with the Ballinagree Wind Farm Project Development Team and Cork County Council Planners on the 22/04/2020 to discuss the proposed project. The Local Authority Planners provided planning and environmental knowledge of the study area which will help shape the environmental impact assessment process for the project. Furthermore, the Local Authority Planners encouraged further consultation with other departments of the County Council, including the Archaeologist, Conservation Officer, Ecologist and Area Engineer. These various departments have since been contacted regarding the project.

Pre-application Consultation Meeting

As part of the Strategic Infrastructure Development process, as detailed in section 1.2 of this report, Coillte Renewable Energy and Brookfield Renewables submitted a pre-application consultation request to An Bord Pleanála in March 2020 under planning reference PL28 .306948. A pre-application consultation meeting will be held with the Ballinagree Wind Farm Project Development Team and representatives of An Bord Pleanála on the 8th of July 2020.

2. PROJECT DESCRIPTION

2.1 Proposed Wind Farm

Under the current design parameters the proposed development will consist of 19 no. wind turbines with a tip height of up to 185m and rotor diameter of up to 155m, turbine foundations and hardstand areas, new access tracks and upgrading of existing access tracks, an on-site substation and compound including control buildings and associated electrical equipment, underground electrical and communications cabling, anemometry mast of minimum 100 meters in height for measuring wind speed and direction, borrow pits, drainage and sediment controls, temporary construction compounds, tree felling, biodiversity enhancement and conservation areas and all associated works.

The current layout, Design Iteration 1 (DI1), is illustrated in Figure 1.2. The layout of the proposed wind farm has been designed to minimise the potential environmental effects of the wind farm while at the same time maximising the energy yield of the wind resource passing over the project site.

The electricity generated by the proposed wind farm will be transmitted by a collector system of underground cables to the proposed on-site substation. The proposed development will also comprise underground cables from the development to the National Grid connection point as well as improvements to the public road network for the delivery of turbine components.

2.2 Grid Connection

It is proposed to supply power from the Ballinagree Wind Farm to the Irish electricity network via underground cable to either the existing Clashavoon 220kV substation located in the townland of Caherdowney or the Ballyvouskill 220kV substation located in the townland of Aughinida. The proposed on-site substation is currently located in the townland of Ballynagree West and will connect to one of the substation options via an underground cable.

A substation is proposed on-site which will collect the electricity produced by the wind farm. The grid connection cable will follow the route of the existing public road between the proposed substation and the point of connection at one of the existing 220kV substations. The final route will be decided in consultation with Eirgrid.

Connection will be sought under the Enduring Connection Process (ECP) grid access regime. The grid connection will be considered in the Environmental Impact Assessment Report.

The proposed grid connection route options are shown in Figure 2.1.

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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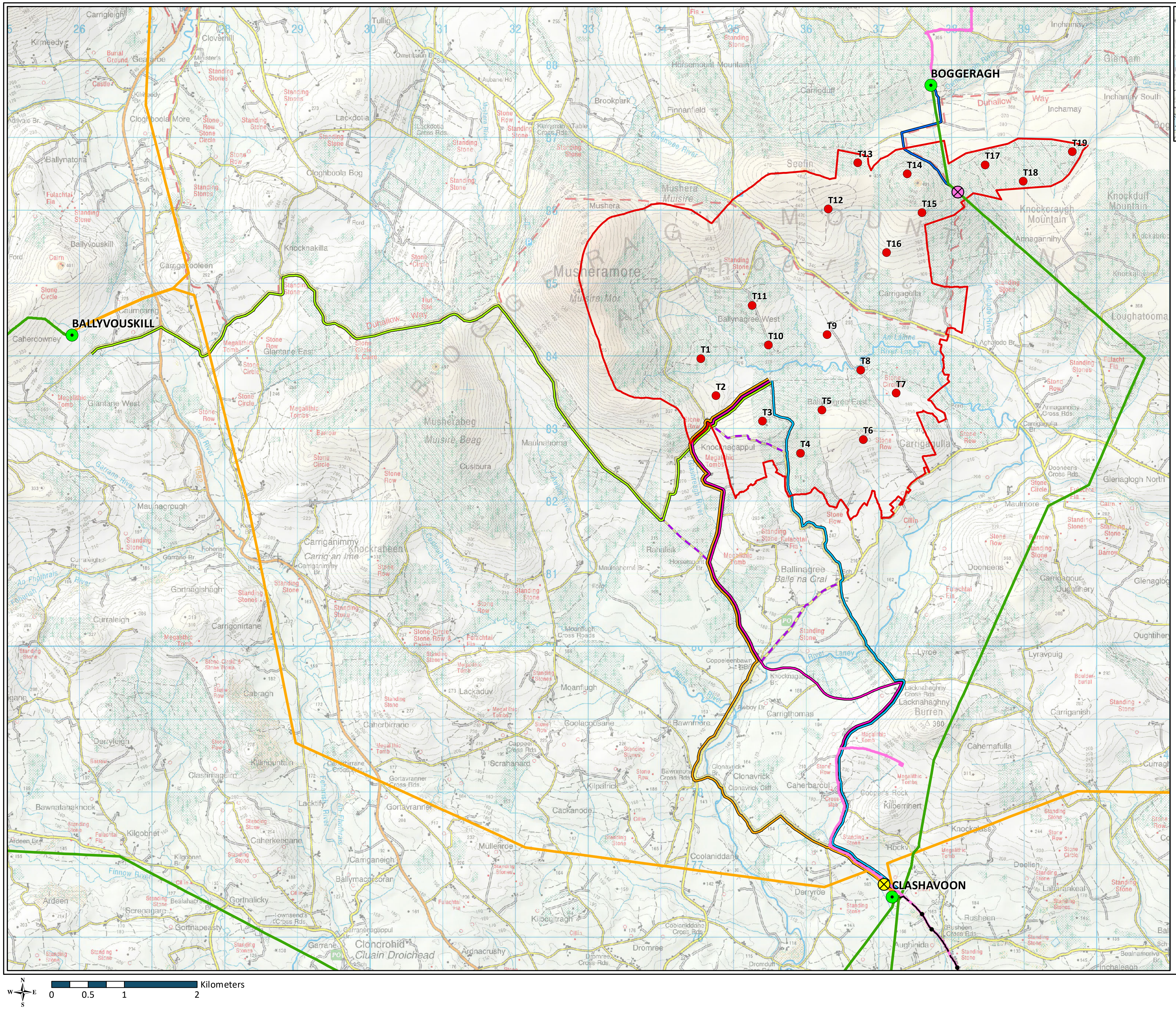

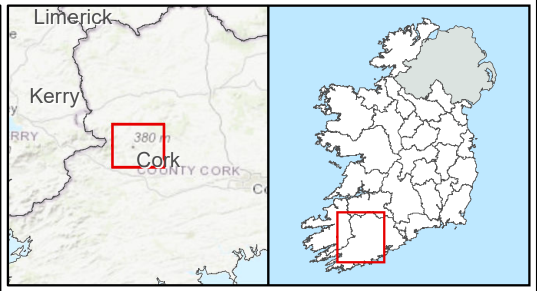

Proposed Turbine Layout

Site Boundary

Substations (110-220kV)

Existing Overhead ESB Lines (38-400kV)

400KV Line

220KV Line

110KV Line

38KV Line

Other

Proposed Cable Route Options

Option A - 110kV UGC

Option B - 110kV UGC

Option C - 110kV UGC

Option D - 110kV UGC

Option E - 220kV Loop into OHL

Option F - 110kV UGC

Option G - 110kV Loop into OHL

Route Variant Options

TITLE: Grid Connection Options			
PROJECT: Ballinagree Wind Farm			
FIGURE NO:	2.1		
CLIENT:	Coillte		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/06/2020	**PAGE SIZE:**	A3

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2.3 Turbine Delivery

A number of wind turbine components will enter the country through the ports including the blades, tower sections and the nacelles. The wind turbine components will be delivered to site by special transport vehicles and assembled on-site. A number of routes are being assessed to determine the most appropriate turbine delivery route.

It is likely that the turbine components will be transported to the proposed project via the N72 and R583 to Millstreet and then along the L1123 local road to the project.

The preliminary turbine delivery routes are shown on Figure 2-2

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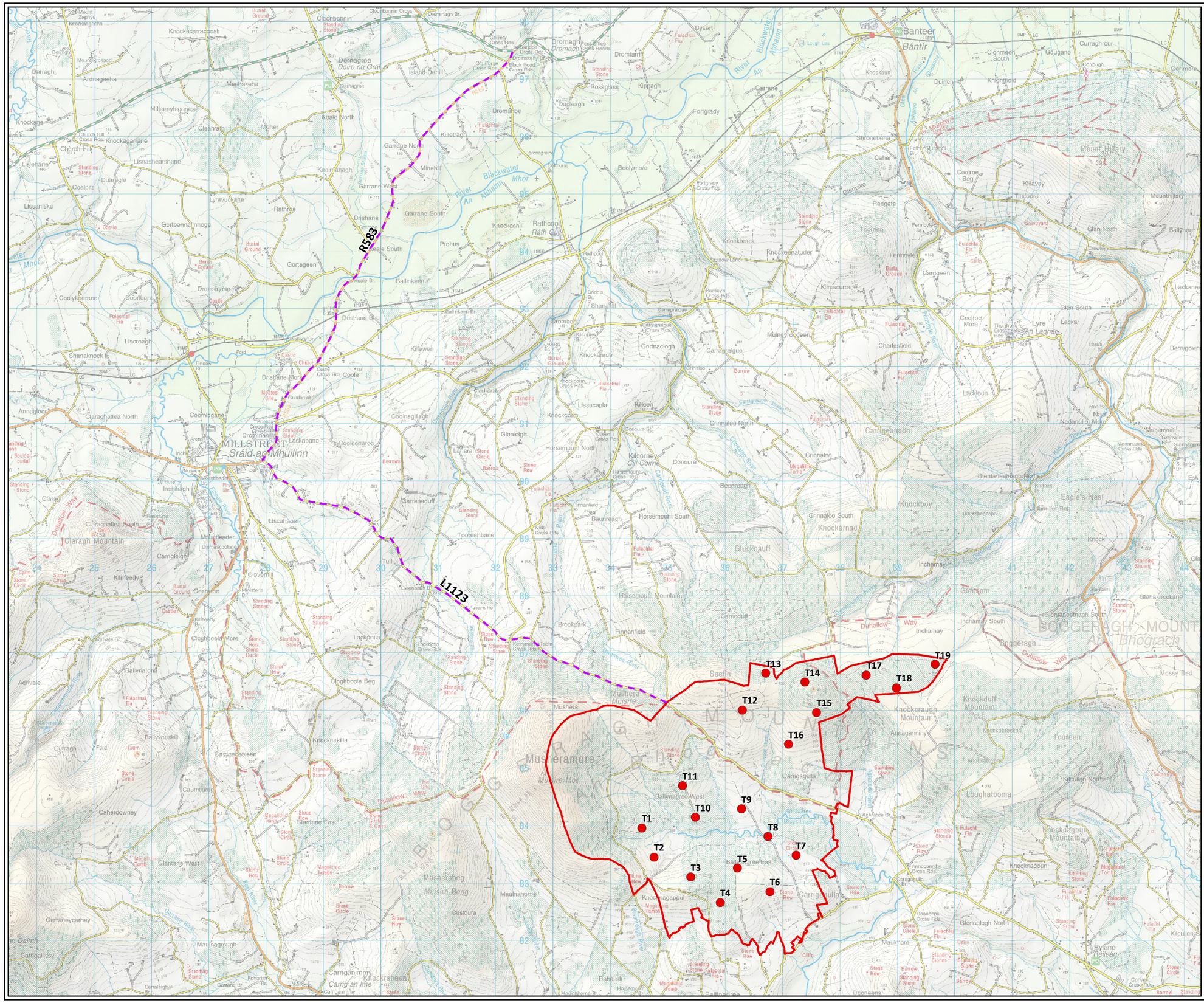

Proposed Turbine Delivery Route

Proposed Turbine Layout

Site Boundary

TITLE:	Turbine Delivery Route
PROJECT:	Ballinagree Wind Farm
FIGURE NO:	2.2
CLIENT:	Coillte
SCALE: 1:65000	**REVISION:** 0
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3. STRUCTURE AND SCOPE OF THE EIAR

3.1 Content of the EIAR – Statutory Requirements

The EIAR will be prepared in accordance with Schedule 6 of the Planning and Development Regulations 2001, as amended, which sets out the contents of an EIAR. In addition, the contents of Directive 2014/52/EU, which was adopted in the EU on 16 April 2014, will also be included in the preparation of this EIAR (the 2014 EIA Directive).

The purpose of the EIAR is to provide in particular:

a) a description of the project comprising information on the site, design, size and other relevant features of the project;
b) a description of the likely potential significant effects of the project on the environment;
c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
e) a non-technical summary of the information referred to in points (a) to (d); and
f) any additional information relevant to the specific characteristics of the wind farm project proposed.

The EIAR will identify, describe and assess the direct and indirect significant effects of the project on the following factors:

a) population and human health
b) biodiversity, with particular attention to protected species and habitats
c) land, soil, water, air and climate
d) material assets, cultural heritage and the landscape
e) the interaction between the factors referred to in points (a) to (d).

3.2 EIAR Methodology

3.2.1 General

The EPA and the European Commission (EC) have published guidelines on the preparation of environmental impact assessment reports, namely:

- Draft Advice Notes on Preparing Environmental Impact Statements (EPA, 2015);
- Draft Guidance on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA), 2017);
- Environmental Impact Assessment of Projects - Guidance on Scoping (European Commission (EC), 2018);
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

The EIAR team will have regard to these guidelines in the preparation of the EIAR.

The team will also have regard to best practice guidance for individual environmental topics. Regard will also be paid to the 'Best Practice Guidelines for the Irish Wind Energy Industry' published by the Irish Wind Energy Association and the 'Wind Energy Development Guidelines' published by the Department of Environment, Heritage and Local Government (2006) and the subsequent Draft Revised Wind Energy Development Guidelines (2019).

There are two different EIAR structures which are commonly used and which the EPA guidelines accept as equally valid. The structure, which the EIAR team proposes to use for the EIAR for the proposed Ballinagree Wind Farm project, is the grouped format structure.

Using this structure there is a separate chapter for each topic, e.g. air quality, biodiversity, hydrology. The description of the existing environment, the proposed development and the potential impacts, mitigation measures and residual impacts are grouped in the chapter. The grouped format makes it easy to investigate topics of interest and facilitates cross-reference to specialist studies.

Given the need to ensure that the EIAR is readily accessible to the general public, as well as to the statutory authorities, the EIAR team has proposed to structure the EIAR as described below:

- Non-technical Summary
- Introduction
- Need for the Development & Alternatives Considered
- Description of the Proposed Development
- Policy and Legislation
- EIA Scoping, Consultation and Key Issues
- Air Quality and Climate Change
- Noise and Vibration
- Biodiversity
- Land, Soils and Geology (including hydrogeology)
- Hydrology & Water Quality
- Population, Human Health & Material Assets
- Shadow Flicker
- Traffic and Transportation
- Archaeology, Architecture and Cultural Heritage
- Landscape & Visual
- Telecommunications & Aviation
- Interactions of the Foregoing

3.2.2 EIAR Chapter Structure

The broad methodology framework used in each chapter will include the following:

- Introduction
- Methodology
- Existing Environment
- Potential Impacts
- Mitigation Measures
- Residual Impacts

Introduction
This section introduces the environmental topic to be assessed and the areas to be examined within the assessment.

Methodology
Specific topic related methodologies are outlined in this section. This will include the methodology used in describing the existing environment and undertaking the impact assessment. It is important that the methodology is documented so that the reader understands how the assessment was undertaken. This can also be used as a reference if future studies are required.

Existing Environment
An accurate description of the existing environment is necessary to predict the likely significant impacts of a new development. Existing baseline environmental monitoring data can also be used as a valuable reference for the assessment of actual impacts from a development once it is in operation.

To describe the existing environment, desktop reviews of existing data sources will be undertaken for each specialist area relying on published reference reports and datasets to ensure the objectivity of the assessment. Desktop studies are also supplemented by specialised field walkovers or studies in order to confirm the accuracy of the desktop study or to gather more baseline environmental information for incorporation into the EIAR.

The existing environment will be evaluated to highlight the character of the existing environment that is distinctive and what the significance of this is. The significance of a specific environment can be derived from legislation, national policies, local plans and policies, guidelines or professional judgements. The sensitivity of the environment will also be described.

Potential Impacts
In this section, individual specialists predict how the receiving environment will interact with the proposed development. The full extent of the proposed development's effects and emissions before the proposed mitigation measures are introduced is outlined. Impacts from both the construction and operation phases of the proposed development are outlined. Interactions and cumulative impacts with other environmental topics are also included in this evaluation.

The evaluation of the significance of the impact is also undertaken. Where possible, pre-existing standardised criteria for the significance of impacts will be used in accordance with the guidelines set out in the EPA (2015) Draft Guidelines on the Information to be contained in Environmental Impact Statements. Such criteria can include Irish legislation, international standards, European Commission and EPA guidelines or good practice guidelines. Where appropriate criteria do not exist the assessment methodology section states the criteria used to evaluate the significance.

Mitigation Measures
If significant impacts are anticipated mitigation measures will be devised to minimise impacts on the environment. Mitigation measures by avoidance, by reduction and by remedy can be outlined.

Residual Impacts
The assessment identifies the likely impact that will occur after the proposed mitigation measures have been put in place. These impacts are described in detail and assessment of their significance undertaken.

3.2.3 EIAR Report Structure

The structure proposed for the EIAR is as follows:

Volume 1 - Non-Technical summary
Volume 2 - Main EIAR
Volume 3 - Appendices for the EIAR
Volume 4 – Photomontages and Visual Maps

4. ENVIRONEMTNAL ISSUES TO BE ADDRESSED IN THE EIAR

4.1 Introduction

The EPA Advice Notes provide guidance on the topics which would usually be addressed when preparing an EIAR for different classes of development. The Advice Notes highlight typical issues, which would arise for each development class. Project Type 33 is 'installations for harnessing wind power for energy production (wind farms)'. The scope of the EIAR will have regard to the guidance provided on the issues to be addressed for a Project Type 33.

The EIAR will summaries International, European, National and Local Energy and Planning Policy, the challenges associated with Climate Change and the related need for the proposed development.

4.2 Alternatives Considered

The alternatives, which were considered, when developing the overall configuration of the proposed Ballinagree Wind Farm will be described and the technology options for the project will be outlined in Chapter 2 Need for the Development & Alternatives Considered.

The principle alternatives studied with respect to the Ballinagree Wind Farm will be outlined under the following headings:

- Locations – This will include a discussion of the overall project site selection process for the Ballinagree Wind Farm on a national, regional and local scale. It will include a project site selection report which will be included in the EIAR outlining details of the criteria used to determine project site suitability for wind energy development including:
    - Wind resource;
    - Proximity to residential dwellings;
    - Land Zoning in County Development Plans;
    - Established and Future Land-Use;
    - Ecological Conservation Designations;
    - Landscape Designations; and
    - Ease of Access etc.

- Access – Details of the criteria used to select the network of access tracks that will provide access from the public road network to the project site (and to each turbine within the site) in addition to those that will provide internal connections (as an alternative to using public roads) between turbines will be outlined. This will include information on the availability of existing track, suitable ground conditions, terrain, local road infrastructure etc.

- Connection to the National Grid – Details of the criteria used to select the proposed grid connection route will be provided. This will include an assessment of alternative grid connection route options.

The reasons, including environmental and plan-led considerations will be explained.

4.3 Scheme of Description

The EIAR will describe each element of the project including the following:

- Existing Environment
- Landownership
- On-site Wind Resource
- Turbine Layout
- Power Output
- Turbine Typical Components
- Access Tracks and Hardstandings
- Watercourse Crossings
- Grid Connection
- On-site Substation
- Anemometry Mast
- Electrical Cabling
- Traffic Management
- Turbine Delivery
- Tree Felling
- Replant Lands
- Wind Farms in Proximity
- Construction Overview
- Operation and Lifespan
- Community Benefit Package
- Decommissioning

In a judgement in 2014, O'Grianna v. An Bord Pleanála, Cork County Council and Framore Limited, it was ruled that all planning permission should not be granted for a wind farm project requiring a grid connection unless the grid connection details are provided in the Environmental Impact Assessment (EIA) process.

Arising from this it is essential that the details of this project and its proposed grid connection should be provided in the EIA process, this will be set out in the Description of Development in detail in Chapter 3, while Chapter 2 will provide a detailed assessment of alternatives considered in relation to the preferred grid connection route.

The operating procedures and hours, staffing, monitoring, maintenance requirements, and the provision for decommissioning of the proposed Ballinagree Wind Farm will also be outlined.

If planning consent is secured for the proposed development, tree felling, site preparation works, upgrading of existing access tracks and the provision of new access tracks will precede all other activities. Drainage infrastructure will be constructed in parallel with the track construction. This will be followed by the construction of the turbine foundations and the provision of the hardstanding areas. In parallel with these works the on-site electrical works; sub-station and internal cable network; will be completed. The cable from the wind farm to the proposed grid connection point will then be laid underground, primarily along public roads. Any works required to the public road network to facilitate turbine delivery will also be carried out.

4.4 Construction Activities

The Ballinagree Wind Farm will have a defined planning boundary to include not only the turbines but all ancillary infrastructure such as transformers and crane hardstanding areas at each turbine, borrow pits, new and upgraded access tracks, on-site underground cabling, substation and construction compounds. Details on all of these elements will be provided within the EIAR.

Information will be provided on the following aspects of the construction of the Ballinagree Wind Farm:

- Construction programme
- Construction sequence and methodology
- Drainage control measures
- Temporary site facilities
- Site preparation works
- Access road construction and upgrade
- Borrow pits and reinstatement works
- Cable installation on site
- Turbine foundation and associated hardstanding area construction
- Turbine delivery and installation
- Commissioning

The control measures that will be implemented to manage the risk of soil and water pollution, emissions of dust and noise, construction waste management and traffic impacts will be explained.

4.5 Consultation Program

Outlined in Section 1.5 of this report are the primary consultation methods and actions that have occurred to date. Over the course of the final design and preparation of the EIAR, consultation will continue with the community, stakeholders and consultees. As part of the EIAR, full details of all consultation will be documented and assessed.

4.6 Environmental Aspects: Population, Human Health & Material Assets

4.6.1 Aspects to be Addressed

The Population, Human Health and Material Assets Chapter of the EIAR will assess the likely significant effects of the proposed development on Population, Human Health and Material Assets with a particular reference to the topics of population, human health, socio-economic activity, land-use, recreation, amenity and tourism, and material assets.

Population
The potential impacts of the proposed Ballinagree Wind Farm on population trends and statistics (density, age) will be addressed in this chapter.

Human Health
The potential impacts on human health from the proposed Ballinagree Wind Farm will be assessed.

Health and Safety
Details relating to health and safety arising from the proposed construction, operation and decommissioning of the wind farm will be assessed.

Socio-economic Activity
The potential impacts of the proposed Ballinagree Wind Farm on employment and economic activities of the region and locality.

Land-use
The assessment will address the potential impacts of the proposed windfarm on existing and proposed land use.

Recreation, Amenity and Tourism
The assessment will address the potential impacts of the proposed Ballinagree Wind Farm on residential amenity, recreational facilities and activities and tourism of the region.

Material Assets
The potential impact of the proposed development on physical infrastructure including renewable and non-renewable resources as well as utility infrastructure will be assessed.

4.6.2 Assessment Methodology

Population
With the purpose of analysing population trends and statistics on the proposed area, population data from the Central Statistics Office will be obtained for the study area defined by electoral division, including the area of the grid route corridor. The statistics of this data is compared against county and state trends, density and age.

Human Health

The assessment will contain a desk study review of the potential impacts of the construction, operation and decommissioning of renewable energy developments on human health using published and verified sources of information.

Health and Safety

The assessment will contain a desk study review of the impacts of the construction, operation and decommissioning of renewable energy developments on health and safety using published and verified sources of information.

Socio-economic Activity

Data from the Central Statistics Office will be used to define the socio-economic baseline. Desktop research and consultation will provide an indication of economic activity in the study area. The potential positive and negative impacts of the proposed wind farm on employment and economic activity both directly and indirectly, will be assessed.

Land-use

The land uses in the area, which could potentially be affected by the proposed development, will be described using Corine 2018 land cover data and desktop research. This data will be verified by subsequent walkovers and surveys.

Recreation, Amenity and Tourism

All areas of scenic beauty in addition to heritage, culture and leisure facilities and activities in the study area will be identified. A review of the main recreational activities in the area likely to be affected will be conducted. Residential amenities and recreational facilities, such as forestry in public ownership, walking paths, sports facilities, will be recorded and potential impacts assessed.

An assessment will then be conducted for each element of the proposed Ballinagree Wind Farm to ascertain any potential impacts that may arise which could directly or indirectly affect recreational activity or an amenity. This assessment will be prepared giving cognisance to other disciplines such as cultural heritage and archaeology, hydrology and ecology.

A review will be conducted of a number of published studies and surveys which have been conducted both in Ireland by Fáilte Ireland and in the UK on the attitude of tourists to wind farms. A study of the potential impacts that the proposed development may have on the tourism of the region will be carried out by reviewing Fáilte Ireland surveys, appraising the existing patterns of the tourism within the county and appraising the impacts that wind farms have on tourism in other counties and countries

Material Assets

Information on the existing material assets within the receiving environment will be obtained from the various utility providers such as ESB and Gas Networks Ireland. The assets identified will be assessed in the context of the proposed development. The proposed Ballinagree Wind Farm will also be considered under the material assets section in its own right as it will be classed as a renewable resource.

4.6.3 Receiving Environment

The project is located to the east of the Musheramore Mountain, ca 8km south east of Millstreet and ca. 10km north of Macroom. The closest settlement to the proposed development is Ballinagree, ca. 2km south east of the project boundary. Due to topography, areas north of the proposed project are sparsely populated with a greater concentration of dwellings to the south.

Within 2km of the project boundary there are 174 no. dwellings including 32 no which are a mix of residential and commercial. There are 4 no. commercial properties located within 2km, centred on the town of Ballinagree.

Landcover includes peat bogs, coniferous forestry, agricultural lands and transitional woodland-shrub. Coillte had substantial forestry holdings in the area. Existing wind farm development is located to the north of the project. Walking and hiking trails are located in the area and angling is noted as a popular recreation activity in the region.

4.6.4 Potential Impacts

Population

The potential impacts arising from the proposed development on population during construction are likely to be slight positive, given the enhanced employment opportunities associated with the proposed development. During operational phase these impacts would likely be reduced to imperceptible. The assessment will consider the potential impacts during all phases of the proposed development.

Human Health

The potential affects arising from the proposed development which can impact on human health during construction, operational and decommissioning will be considered in this chapter. Once operational, turbines contribute to the production of renewable energy and for this reason, it is thought that the operational phase will deliver positive impacts to human health.

Health and Safety

If not properly designed and constructed, there is the potential for construction and operational activities associated with the proposed development to impact on the health and safety of employees associated with the development as well as the public. Best practice construction and environmental management measures will be employed to prevent the potential for accidents. The EIAR will be accompanied by a comprehensive Outline Construction and Environmental Management Plan which will include detailed health and safety requirements during the construction, operation and decommissioning of the proposed Ballinagree Wind Farm. With the implementation of measures outlined in the EIAR and oCEMP, it is anticipated that the proposed development is not likely to have a potential significant impact on human health and safety (pending a full environmental impact assessment).

Socio-Economics

The proposed development will have significant long and short term benefits for the local economy including job creation, landowner payments, local authority commercial rate payments and a Community Benefit Scheme. These will be developed in full and considered in the EIAR.

Land Use
The proposed development will require land take for the access tracks, wind turbines bases and adjacent hard-standings and sub-station footprints. The current land uses will continue other than within this land take. Full details will be contained in this chapter of the EIAR.

Recreation, Amenity and Tourism
Potential construction impacts from the grid connection cables include full or partial closure of roads used within the area, while the cables are being installed. There may be disruption to access routes and walking paths, however any disruption will be mitigated where possible by maintaining access for people throughout, and where this is not possible, in minimising the impact, clearly communicating the timing and scope of works to the local community. Possibilities for improvements to recreation facilities in the area will be considered.

Material Assets
Utilities such as overhead power lines or telephone lines or underground services may require diversion or be temporarily disrupted during the construction of the wind farm, grid route and delivery of turbines. This has the potential to impact on nearby dwellings and commercial / industrial activities. All potential impacts will be considered in full in this chapter.

4.7 Environmental Aspect: Shadow Flicker

4.7.1 Aspects to be addressed

This chapter will address the potential effects on human beings of shadow flicker, i.e. the moving shadows cast by the turbine blades in times of direct sunlight.

4.7.2 Assessment Methodology

A shadow flicker assessment will be carried out using ReSoft Wind farm software which will calculate times throughout the year when a turbine, viewed from the window of a house, is in line with the sun, and therefore the potential exists for shadow flicker to occur. All occupied and unoccupied dwellings and permitted houses (that are not yet constructed) as well as any other property considered sensitive (schools etc) within 10 rotor diameters of a proposed turbine will be included in the assessment. The effect of shadow flicker is not considered significant beyond the distance of 10 rotor diameters from each turbine location.

The outputs of the modelling assessment will be used to identify the potential direct and indirect impacts of shadow flicker on dwellings. The results will be compared with relevant guidance including:

- Section 5.12 of the 2006 Department of Arts, Heritage and the Gaeltacht (DoEHLG) Planning Guidelines on Wind Energy Developments (2006).
- Section 5.8 of the Department of Housing, Planning and Local Government's Draft Revised Wind Energy Development Guideless (2019)
- The Irish Wind Energy Association 'Best Practice Guidelines for the Irish Wind Energy Industry' (2012) .

Cumulative impacts of the proposed Ballinagree Wind Farm and other third-party schemes will be assessed. IWEA Best Practice Guidelines (2012, Section 6.3.4) states that "any such wind farm developments within 2 km of the proposed development should be considered in a separate cumulative shadow flicker assessment. Potential cumulative impacts of shadow flicker between the proposed development and the adjacent Boggeragh Wind Farm will be considered.

4.7.3 Receiving Environment

The general receiving environment is rural. The majority of buildings in the vicinity of the proposed development are residential or agricultural buildings. Much of these receptors are located south of the proposed development with very few dwellings in proximity to the northern section of the project.

4.7.4 Potential Impacts

In times of direct sunshine, wind turbine blades could occasionally cast moving shadows on residences in close proximity to the turbines. At certain times of the year, the moving shadows of the turbine blades can periodically reduce light to a room causing the light to appear to flicker. Shadow flicker would not generally have any effect on health or safety but could on limited occasions present a brief nuisance effect.

4.8 Environmental Aspect: Noise and Vibration

4.8.1 Aspects to Address

The chapter will address noise and vibration impacts from the construction, operation and decommissioning of the proposed wind farm.

4.8.2 Assessment Methodology

The noise assessment will be carried out on each phase of the wind farm:

- Construction phase
- Operational phase, including turbine and sub-station operations
- Decommissioning phase, including dismantling the turbines, and related traffic.

The Wind Energy Development Guidelines (2006) are currently the statutory guidelines for carrying out noise assessments for wind energy development in Ireland. Draft Guidelines were published in December 2019 and these are currently being reviewed by the developer. The Wind Energy Development Guidelines 2006, the Draft Wind Energy Guidelines and reference to the Institute of Acoustics (IOA) 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' will all be considered in developing and assessing the wind farm.

The noise impact assessment will involve measurement of background noise levels and predicting noise impacts from the proposed development and nearby operational and consented developments. The background noise levels will be used to derive noise limits in accordance with relevant guidelines at the time the development is submitted for planning. In the event that the predicted noise levels exceed the noise limits, mitigation measures will be outlined.

Construction/decommissioning noise predictions will be carried out to determine the noise levels at the nearest noise sensitive locations. Noise prediction will be carried out using British Standard BS 5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. Predicted construction noise levels will be compared against noise levels in BS 5228:2009+A1:2014 Part 1. Where the impact significance identifies a requirement for mitigation, mitigation measures will be outlined.

4.8.3 Receiving Environment

All dwellings in proximity to turbines have been identified. A minimum setback distance of 750m between turbines and occupied dwellings shall be implemented as part of the design process.

4.8.4 Potential Impacts

Potential impacts of noise nuisance will be addressed at the design stage by locating turbines at sufficient separation distances or by employing reduced turbine noise modes to comply with the noise limits in force at the time of application.

4.9 Environmental Aspect: Traffic and Transportation

4.9.1 Aspects to be Addressed

The traffic impact assessment will address the traffic impacts on the road network from the construction, operation and decommissioning of the proposed Ballinagree Wind Farm. The assessment will include the supply of materials, plant and equipment, the turbine elements and the components of the sub-station. Traffic arising from the construction and operations workforce will also be addressed.

4.9.2 Assessment Methodology

A traffic impact assessment will be conducted in accordance with the Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines, May 2014. Data collected from road traffic surveys along the delivery route will be used in the assessment.

A route survey will be carried out by a specialist transport consultant between the port of entry options and proposed project entrance locations. This survey will identify potential pinch points and locations that may require off site temporary upgrades to facilitate the safe transport of the turbines to the development area.

Auto Track vehicle swept path analysis (SPA) will be conducted for all internal tracks to ensure that they are adequate to allow delivery of turbine components while also minimising the required land take where feasible. SPA will also be carried out on pinch points identified in the transport route survey report.

The methodology for the traffic impact assessment will include a review of the traffic volumes and impacts which will be generated by the construction, operation and decommissioning of the wind farm. The traffic generated by the construction workforce, by the transport of materials and equipment as well as future maintenance-related activities will be predicted. The traffic distribution pattern on the local road network during construction will be examined and impacts determined. The potential disruption to the road network during the installation of the cables and the availability of alternative routes will be assessed, where required. Recommendations will be made to mitigate any potential traffic impacts on the road network.

4.9.3 Receiving Environment

The project is accessed by local roads and is bisected by the Millstreet to Rylane road, the L1123, which connects to the L2551 to the south east of the project. The N22 national primary route is located 10km to the south at Macroom. The N72 is located approximately 13km to the north at Banteer. The R579 is located 5km to the east and the R582, 5km to the west. The project area has a significant amount of existing forestry and farm tracks. It is likely that Ringaskiddy Port will be used for the importation of turbines. The port is located approximately 45km south east of the project.

4.9.4 Potential Impacts

A Traffic Impact Assessment will address the traffic impacts on the road network for the construction, operation and decommissioning of the proposed Ballinagree Wind Farm. The assessment will include the supply of materials, plant and equipment, the turbine elements and the components of the substation. Traffic arising from the construction and operations workforce will also be addressed.

The traffic impact assessment will be conducted in accordance with the Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines, May 2014. Data collected from road traffic surveys along the delivery route will be used in the assessment. The impact assessment will include a review of the traffic volumes and impacts which will be generated by the construction and operation of the proposed wind farm. The traffic generated by the construction workforce, by the transport of materials and equipment as well as future maintenance-related activities will be predicted. The traffic distribution pattern on the local road network during construction will be examined and impacts determined. The potential disruption to the road network during the installation of the cables and the availability of alternative routes will be assessed, where required. Recommendations will be made to mitigate any potential traffic impacts on the road network.

The greatest potential for traffic impact from the proposed Ballinagree Wind Farm is during the construction phase which will give rise to additional traffic on the road network.

The turbines will be delivered to the proposed project area in separate parts, typically comprising of loads for each of the towers, the rotor blades, the nacelle, the rotor hub, the turbine base and the electrical components. The delivery route from the port into which the components are shipped, to the proposed wind farm will use the national primary route network as much as possible. Modifications may be required to the existing local road network to cater for the delivery of the oversized loads.

Stone aggregate will be required for the upgrading of existing tracks and construction of new roads as well as the construction of turbine bases and hardstands. All of these activities have the potential to generate significant local traffic numbers.

There will be an increase in local traffic during the construction of the wind farm; staff, including plant operators, electricians, engineers and trades people, will be commuting to and from the proposed project area each morning and evening. In addition, there is likely to be an increase in local traffic due to onlookers as the turbines are erected.

There will also be temporary traffic impacts from cable laying works on the public roads. These impacts will be managed to reduce the nuisance being caused to local road users.

4.10 Environmental Aspect: Air Quality and Climate

4.10.1 Aspects to be Addressed

The assessment will address the potential impacts on air quality due to construction and decommissioning equipment and activities and to emissions from traffic associated with the construction process. The potential impacts on air quality in the operational phase will also be addressed.

The climate in the immediate local area of a proposed development is known as the micro-climate whereas the climate of a large geographical area (global) is the macro-climate. The potential impacts of the proposed Ballinagree Wind Farm on micro-climate and macro-climate will be addressed. The project will also be assessed for compliance with the Climate Action Plan 2019.

4.10.2 Assessment Methodology

Air quality monitoring conducted by the EPA at a number of locations in the vicinity of the project will be reviewed and levels compared with the air quality standards. To assess the impacts of construction dust emissions, the approach and assessment criteria outline in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011) will be used.

For the purposes of assessing the impact on air quality of emissions generated by construction traffic, the methodology described in the Design Manual for Roads and Bridges (DMRB) (Volume 11, Section 3 Air Quality, May 2007) will be used. Parameters to be assessed will include oxides of nitrogen, particulates PM10 and PM2.5, carbon monoxide and benzene.

The potential micro-climatic impacts of the proposed Ballinagree Wind Farm will be assessed in relation to the micro-climatic baseline, the scale of the elements of the project and the nature of use of the surrounding environment. For the assessment of macro-climatic effects, the emissions of carbon dioxide (CO2) and other greenhouse gases from fossil fuel power generation, which will not be required should the proposed Ballinagree Wind Farm become operational, will be quantified and assessed in terms of Ireland's commitments under EU and international climate change treaties and protocols.

4.10.3 Receiving Environment

In terms of micro-climate, the proposed wind farm is located in a rural area corresponding to air quality zone D, Rural Ireland, in the Air Quality Regulations SI 180 of 2011, as amended. Therefore, the air quality is expected to be good.

The macro-climatic baseline is the future emission of CO2 and other greenhouse gases, which would be produced by fossil fuel power generation in the country, in the absence of the proposed wind farm.

4.10.4 Potential Impacts

The assessment will address the potential impacts on air quality due to construction equipment and activities and to emissions from traffic associated with the construction process. The potential impacts on air quality in the operational phase will also be addressed.

The construction phase of the proposed Ballinagree Wind Farm has the potential to generate dust emissions, which could give rise to nuisance for local residents. To assess the impacts of construction dust emissions, the approach and assessment criteria outlined in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2011) will be used.

Construction plant and equipment, and the traffic generated by the construction process, have the potential to give rise to emissions of oxides of nitrogen, benzene and particulates, which could impact on local air quality. The operation of the proposed wind farm is not expected to have a negative impact on air quality.

The proposed Ballinagree Wind Farm is expected to have a positive impact on emissions of CO2 and other greenhouse gases. For the assessment of macro-climatic effects, the emissions of CO2 and other greenhouse gases from fossil fuel power generation, which would not be required when the wind farm is operational, will be quantified and assessed in terms of Ireland's commitments under EU and international climate change treaties and protocols.

It is expected that the proposed development will have a positive impact on Air Quality including NOx and Sox, a calculation of same will be included in the EIAR.

4.11 Environmental Aspect: Biodiversity

4.11.1 Aspects to be Addressed

This chapter of the EIAR will address the terrestrial and freshwater aquatic habitats and species, including those of conservation concern within and in close proximity to the proposed wind farm; including along and in close proximity to the on-site cable routes; on and in close proximity to the sub-station, tree felling and any required replanting. It will also address the potential impacts on ecology from the proposed underground cable between the wind farm and the grid connection as well as any proposed alterations to the public road network required for the delivery of turbine components.

In particular, the assessment will focus on:

- Natura 2000 sites i.e. Special Areas of Conservation designated under the EU Habitats Directive (Council Directive 92/43/EEC) and Special Protection Areas designated under the EU Birds Directive (Directive 2009/147 EC), within 15km of the proposed project and routes.
- Other designated sites such as Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves and Refuges for Fauna or Flora
- Habitats listed in Annex I of the Habitats Directive
- Birds listed in Annex I of the Birds Directive
- The impact on any flight paths of bird and bat species
- Species protected under the Wildlife Acts

- Protected flora under the Flora Protection Order (2015)
- Habitats that can be considered as corridors for the purposes of article 10 of the Habitats Directive
- Red data book species
- And biodiversity in general.

4.11.2 Assessment Methodology

Desk studies will be undertaken in which ecological databases, such as those of the National Parks and Wildlife Service (NPWS), EPA and NBDC will be consulted. The NPWS, Inland Fisheries Ireland and the main environmental non-governmental organisations have been or will be consulted.

Bird survey methods have been selected following a review of best practice guidelines, including guidance available from Scottish Natural Heritage (SNH), and following consultation with NPWS and other bodies such as BirdWatch Ireland. Bird surveys commenced in 2017 and are ongoing at the project site.

The scope of the bird survey includes vantage point surveys (from 10 locations), transect surveys, point counts, Hen Harrier survey, Red Grouse survey, breeding wader, breeding Merlin survey and Collision Risk Modelling.

Habitats shall be appraised and evaluated according to their occurrence as protected habitats under Annex I of the EU Habitats Directive (92/43/EEC) and for their capacity to support rare, threatened and endangered species. The methodology used to assess the impact on habitats is based on NRA guidelines (2009[1]), CIEEM guidelines and EPA guidelines. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011[2]) published by the Heritage Council. In addition to habitat identification, each habitat will be assessed for its ecological significance, based on the National Roads Authority (NRA) Site Evaluation Scheme (NRA, 2009).

Given that a small proportion of the project is located within to the catchment of the Blackwater SAC (002170), and areas of the project which drain to the River Laney and River Lee, aquatic surveys are required to establish the existing baseline and to examine the potential for protected aquatic species to utilise the watercourses draining the project. Surveys shall be required for aquatic Annex I Habitats, Freshwater Pearl Mussel, White-clawed Crayfish and fisheries.

Bat surveys will be undertaken in accordance with Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (Scottish Natural Heritage, 2019[3]). Winter and breeding roost surveys will be required. Activity surveys will also be required during the bat activity season April to September as per Bat Conservation Ireland and Bat Conservation Trust Guidelines.

The proposed project will require surveying for terrestrial mammal species including inter alia Badger, Red Squirrel and Otter. A targeted Marsh Fritillary Survey is required due to the potential for habitat on-site and records within the study area, to assess the distribution of the species within the project area and also the extent of suitable habitat for the species. During the course of ecological surveys of the project area, other species of fauna shall be noted and considered in the ecological appraisal.

[1] NRA (2009). Environmental Assessment and Construction Guidelines. Published by the National Roads Authority.

[2] Smith, G.F., O'Donoghue, P, O'Hora K., and Delaney, E. (2011). Best Practice Guidance for Habitat Survey and Mapping. Published by the Heritage Council.

[3] Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (2019): Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

4.11.3 Potential Impacts

This chapter of the EIAR will address the nationally designated sites, terrestrial and freshwater (aquatic) habitats and species, including those of conservation concern on and in close proximity to the wind farm and including along and in close proximity to the proposed cable route and proposed haul route.

The ecological evaluation of the project area and its' Biodiversity will be assessed according to NRA (2009). Once the value of the identified ecological receptors (features and resources) is determined, the next step will be to assess the potential impact and resulting effect of the proposed development on the identified key ecological receptors.

This will be carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009; CIEEM, 2016). The impacts will be assessed under a number of parameters such as magnitude, extent, timing, frequency, duration and reversibility. The impact significance criteria detailed in the EPA guidelines (EPA, 2002) will be used where applicable.

Potential impacts of the wind farm on Biodiversity include:

- Direct loss of habitat due to the footprint of the area;
- Damage to adjacent habitats during construction which could potentially be affected by construction activity;
- Impacts during construction on the hydrology of water dependant habitats
- Impacts on water quality both at a local level and regional level due to pollution run-off whether during or post construction;
- Impacts on aquatic species during construction or due to pollution events etc.;
- Disturbance to local wildlife, including loss of habitat, disturbance and displacement;
- The potential collision risk to birds and bats;
- Damage to or habitat loss of important wildlife corridors or stepping stones during construction. Fragmentation of same at a larger more regional level as a result of habitat loss;
- The introduction of alien invasive species during construction;
- Displacement of bird species from limited breeding areas;
- Displacement or disturbance to breeding waders from areas within the proposed wind turbine envelope;
- Barrier effect on migrating birds, whereby individual species' dispersal or migration routes are affected by the placement of turbines which effectively cause a barrier;
- Impacts on the conservation status or constituent parts of designated sites.
- Potential impacts associated with tree felling and any required replanting on designated sites, habitats, Biodiversity.

Potential impacts on European (Natura 2000) sites as a result of the proposed development will be assessed though the appropriate assessment process.

4.11.4 Appropriate Assessment

An Appropriate Assessment Screening Report and if required a Natura Impact Statement will be prepared in respect of the proposed development, so as to enable the competent authorities to carry out an Appropriate Assessment as required by Article 6(3) of Council Directive 92/43/EEC ("the Habitats Directive") and section 177U of the Planning and Development Act 2000, as amended ("the Planning Act"). The potential impact to European sites due to tree felling and any proposed replanting shall also be considered.

In compliance with the aforementioned provisions of Article 6(3) of the Habitats Directive and section 177U of the Planning Act, a Screening Appropriate Assessment of an application for consent for proposed development shall be carried out by the competent authority or authorities to assess, in view of best scientific knowledge, if that proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site, in view of the site's conservation objectives.

Where negative impacts on a Natura 2000 site cannot be discounted during Stage 1 Screening for Appropriate Assessment, the Assessment must proceed to Stage 2 and a Natura Impact Statement prepared at which point a detailed, targeted assessment of the nature and potential significance of direct and indirect impacts arising from the proposed project must be completed and an assessment as to whether the integrity of the Natura 2000 site would be adversely affected.

European sites, as defined in the Planning Act, comprise both Special Protection Areas (SPAs) for birds and Special Areas of Conservation (SACs) for habitats and other species, and are designated by Member States pursuant to the requirements of Council Directive 79/409/EEC, now Directive 2009/147/EU, on the conservation of wild birds ("the Birds Directive") and the Habitats Directive, respectively.

Article 6(3) of the Habitats Directive envisages a two-stage assessment process, which is implemented into Irish law (with some additional requirements) by the provisions of sections 177U and 177V of the Planning Act. Screening for AA in accordance with section 177U is the first stage of the AA process ("Stage One"), in which the possibility of there being a significant effect on a European site is considered. Plans or projects that have no appreciable effect on a European site are thereby excluded, or "screened out", at this stage of the process. Where, however, the competent authority's screening assessment concludes that there is potential for significant effects, then it is necessary to carry out an Appropriate Assessment (AA) ("Stage Two") for the purposes of Article 6(3), and a Natura Impact Statement (NIS) is prepared and submitted to the competent authority.

The first step in the screening process is to develop a list of European sites which may have the potential to be affected by the proposed development. Each relevant European site is reviewed to establish whether or not the proposed development is likely to have a significant effect on the European site. The development area of the proposed Ballinagree Wind Farm is not located within a designated nature conservation site, however there are a number of designated sites within 15km including the following:

- Mullaghanish to Musheramore Mountains SPA (004162), immediately west of the Proposed Project; a Natura 2000 site selected for the ''protection of hen harrier''.
- Gearagh SPA (004109), approximately 13 km to the south; selected for the protection of ''wigeon, teal, mallard and coot''.
- The Gearagh SAC (000108) approximately 15 km to the south; River Lee in Co. Cork.
- Mullaghanish Bog SAC (001890) approximately 15 km to the west; Blanket Bogs.
- The Gearagh (Ramsar site no. 472) approximately 13 km to the south; Wetlands selected to support a ''nationally important population of whooper swan''.
- The Blackwater River (Cork/Waterford) SAC (002170) catchment area.
- Natural Heritage Area (NHA – 002447) Immediately north of the Proposed Project; Peatlands - upland blanket bog habitat

The project is located in proximity to the Blackwater River (Cork/Waterford) SAC (002170) and the Mullaghanish to Mushermore Mountains SPA (004162). Among the qualifying interests protected under the Blackwater River (Cork/Waterford) SAC are seven aquatic species (namely, Freshwater Pearl Mussel, White-clawed Crayfish, Sea Lamprey, Brook Lamprey, River Lamprey, Twaite Shad, Salmon and Otter) and nine habitats including Alluvial forests [91E0].

Among the qualifying interests protected under the Slaney River Valley SAC designation for this site are eight aquatic species (namely, Freshwater Pearl Mussel, Sea Lamprey, Brook Lamprey, River Lamprey, Twaite Shad, Salmon, Otter and Harbour Seal) and seven habitats. The River Barrow and River Nore SAC is designated for twelve species, of which 10 are aquatic, and twelve habitats including dry heath [4030]. The Mullaghanish to Musheramore Mountains SPA is designated for Hen Harrier.

For each European Site, the qualifying interests or special conservation interests of each European site will be identified, and the potential effects summarised under the following headings for the purposes of the screening process:

- Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development or agricultural purposes. Direct impacts can arise as a result of a change in land use or management, such as the elimination of agricultural practices that prevent scrub encroachment.

- Indirect and secondary may arise, for example, when a development alters the hydrology of a catchment area, which in turn affects the movement of groundwater to a site, and the qualifying interests that rely on the maintenance of water levels. Deterioration in water quality could occur as both an indirect and direct consequence of a particular development, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. The introduction of invasive species can also be defined as an indirect impact, which results in increased movement of vectors (humans, fauna, surface water), and consequently the transfer of alien species from one area to another.
- Disturbance to fauna can arise directly through the loss of habitat (e.g. otter holts) or indirectly through noise, vibration and increased activity associated with construction and operation.

In the event that significant effects cannot be ruled out during the Stage 1 Screening for Appropriate Assessment, the process proceeds to Stage 2 Appropriate Assessment and a Natura Impact Statement is prepared. During Stage 2 AA, the effect of the project on the integrity of the European site(s), as defined by its structure and function, and its conservation objectives is appraised. Potential impacts on species or habitats will be evaluated with respect to the scale, extent and nature of the impact, for example the area of habitat affected, changes in hydrodynamics, the percentage reduction in species density, potential changes in species distribution. The duration of the impact will be determined in terms of the duration of the works and also the amount of time required for the species and / or habitat to be replaced or to recover from the impacts. Information on the main alternatives studied by the developer and why they were excluded will also be provided within the AA process.

During Stage 2 of the AA process, mitigation measures can be developed to minimise effects on European Sites.

Mitigation measures will follow the mitigation hierarchy:

- Avoidance
- Reduction
- Remedy

For each mitigation measure the following will be provided:

- Details of how the mitigation will be secured and implemented
- Evidence of the degree of confidence in their likely success
- A timescale of when they will be implemented
- Details of how the mitigation measures will be monitored and how any mitigation failure will be addressed where practical.

4.12 Environmental Aspect: Land, Soils, Geology and Slope Stability

4.12.1 Aspects to be addressed

The assessment will address soils., bedrock and groundwater underlying the wind farm.

4.12.2 Assessment Methodology

The methodology for the soils and geology assessment will be in accordance with the guidelines published by the Institute of Geologists of Ireland in 2013, 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'.

Site walkovers will be undertaken. Each site walkover will include peat probes and/or use of a hand vane/gouge cores at selected locations to confirm the presence and/or depth of peat (if present) across the project area. In addition, the following will also be conducted:

- A review of the characteristics of the entire project area (ground conditions, topography, vegetation cover/condition and peat formation, if any, across the project area)
- Identification of past and present land use of the project area (grazing, forestry etc.) and their current impact on the existing ground conditions
- Identification of potential borrow pit locations (if required)
- Identification of areas for possible storage/reinstatement of peat or other materials
- Identification of potential for peat landslide - With reference to slope stability issues in areas where peat is present, reference will be made to the Guidance Note for Peat Landslide Hazard and Risk Assessments Best Practice Guide for Proposed Electricity Generation Developments.

The data gathered will be used to inform the final location of all turbines and associated infrastructure. An earthworks balance calculation will be prepared for the overall development to assess where excavated material can be beneficially re-used. In addition, an assessment of the volumes of raw material will be made which will in turn be used to determine the number and size of borrow pits required.

4.12.3 Receiving Environment

The quaternary deposits at the project site generally comprise till derived from Devonian sandstones, which is in part overlain by a peat layer. Areas of Blanket Peat are recorded in the northern extent of the project boundary. Podzols & gleys chiefly underlies the project area however peat is the dominant soil coverage.

The bedrock of the project area is predominantly comprised of Devonian Sandstone formations with the western portion of the project underlain by the Upper Devonian Caha Mountain Formation, described as purple and green Sandstone and Siltstones. The eastern portion of the project area is underlain by the Upper Devonian, Ballytrasna Formation which is described as purple Mudstones and Sandstone lithologies. The extreme northern extent of the project boundary is underlain by the Devonian Old Red Sandstone Formation.

The project area is underlain by a number of faults which form the boundary between the mapped bedrock formations described above. These generally trend NW-SE and E-W through the project area.

4.12.4 Potential Impacts

The potential impacts of the development of the wind farm on the geology, hydrogeology and slope stability are:

- The excavation and removal of soil and rock and interference with any existing drainage is a potential direct permanent effect that, without mitigation, could alter the existing hydrogeological balance;
- The construction of the turbines, hardstanding areas, access tracks, borrow pits and cable trenches has the potential to cause hydrogeological impacts by modifying the natural groundwater levels adjacent to the excavation. This in turn may deprive ditches and steams of their natural supply of water which may lead to reduced base flow and recharge to the bedrock aquifer;
- Areas which are underlain by peat deposits are susceptible to slope stability issues, including peat slides and bursts, when changes are made to topography, hydrogeology and hydrology of the area.
- The use of granular fill and other materials for the construction of the access tracks has the potential to have a permanent impact on the source quarries or borrow pits;
- Excavations have the potential to increase erosion and sediment release that could also have additional impacts on water quality due to sedimentation of water courses;
- Soil compaction may occur due to movement of construction and maintenance traffic;
- Removal of sub soils may result in the exposure of the underlying rock to sources of contamination and may increase the vulnerability of the aquifer, whether or not the rock is exposed;
- Chemical pollution may occur as a result of an accidental spillage or leakage of chemicals, runoff from vehicle washing facilities, unset concrete, storage of fuels or refuelling activities, etc. Chemical pollutants may enter the groundwater and have implications for ecology and any wells in the area, particularly those located down-gradient of the project; and
- Sanitary waste arising from temporary construction compounds could lead to contamination of groundwater.

At the substation and along the grid route, the potential impacts are the pollution of groundwater from an oil or fuel spillage during construction.

4.13 Environmental Aspect: Water Quality and Hydrology

4.13.1 Aspects to be Addressed

The assessment will address impacts on hydrology and water quality. The aspects of the hydrological environment that could be affected by the activities associated with the proposed Ballinagree Wind Farm will also be addressed.

4.13.2 Assessment Methodology

The assessment will consist of a review of existing baseline data including water quality data from the EPA, River Basin Management Plans and flood risk data from the Office of Public Works (OPW). The objectives of the relevant River Basin Management Plans in relation to water quality will be considered. The review will include the Cork County Development Plan 2014-2020 and consideration of the policies and objectives of the Plan in relation to surface water and flooding. The assessment will be prepared in accordance with the EPA and OPW guidance. Any concerns expressed by consultees such as Inland Fisheries Ireland and relevant local authorities, relating to hydrology and drainage, will be addressed.

The review will have regard to the baseline data and the studies undertaken for the assessment of impacts on terrestrial and fresh water ecology, geology and hydrogeology in relation to environmentally protected areas, receiving waters and soil conditions.

It is proposed to conduct grab sampling of water courses which could potentially be impacted by construction of the wind farm, where gaps are identified in the review of published data. The scope of this sampling will be agreed with Inland Fisheries Ireland and will also follow relevant guidance for determining baseline water quality.

Site visits consisting of a walkover of the wind farm project area have been undertaken. These surveys included noting and examining the hydrological features and land use across the project area. The information gained on these site visits have influenced the development of Design Iteration 1, providing input with the aim of minimising river/stream crossings, providing a buffer to hydrological features and avoiding areas of significant flood risk.

The Hydrology Chapter will include a section on flood risk identification and assessment. This will include an assessment of the potential increase to flooding elsewhere and it will examine the potential flood risk to the proposed development. The type of development will be assessed in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities, November 2009. Any increase in hard surfaces will be quantified and the impact of this modelled in the downstream structures over watercourses, where flood incidents have been recorded by the OPW. Cumulative impacts with neighbouring developments will also be tested in the model where appropriate.

A peat stability assessment will be carried out to determine potential peat stability issues, in line with the soils and geology chapter.

Where parts of the development are located on areas encroaching on floodplains, this may require additional drainage measures and further measures required to mitigate flood risk. Mitigation, such as attenuation of surface water run-off from the project, will be proposed where increases in flood risk are deemed to be significant.

In the case of essential infrastructure such as a sub-station, these are not permitted to be located in a floodplain.

For the access tracks, the stream crossings will be identified, and a preliminary design of the proposed stream crossings prepared. The accommodation of overland flow will be assessed and suitable locations for the treatment of discharges identified.

The following will also be included as part of the assessment for Hydrology:

- Identify potential impacts of the proposed development on hydrology (hydrodynamics and flooding).
- Identify potential cumulative hydrological impacts of the proposed development with any neighbouring wind farms or significant projects.
- Consider potential drainage into sensitive catchments.
- Drainage investigation will involve identification of drainage sub-catchments, studying the requirement(s) of cross-drainage works, if any, exploring the infiltration potential of the soils in the area, etc.
- Identification of mitigation measures for flooding and pollution of receiving waters.
- Identification of residual impacts.

4.13.3 Receiving Environment

The majority of the proposed project lies within the Sullane_SC_020 sub-catchment, with a small section of the north east of the project located within the Blackwater (Munster)_SC_070 sub-catchments as defined by Water Framework Directive (WFD). Greenfield runoff drains mainly to the River Laney and its tributaries. The River Laney is a tributary of the River Lee (Cork). The northern part of the proposed project is within NAD_010 and Glen (Banteer)_010 sub-basins which drain into the Blackwater River (Cork/Waterford) SAC (002170).

According to the PFRA maps there are areas in the vicinity subject to flooding, but these are small and close to the project boundary.

4.13.4 Potential Impacts

The main potential impact from the construction of typical wind farm developments is the sedimentation of watercourses. Rainfall run-off containing silt could potentially lead to siltation and consequent physical effects on Biodiversity in aquatic habitats.

Sediment has the potential to arise from:

- Temporary spoil heaps from the excavations for the turbine bases; if left exposed, the spoil heaps could lead to an increase in silt-laden run-off.
- Haulage roads passing close to watercourses could allow the migration of silt-laden run-off into watercourses (crushable stone in access roads could lead to heavy vehicles creating fines in the stone with a subsequent loss of sediment in the surface water run-off).
- Silt carried on the wheels of vehicles leaving the project area could be carried onto the public road.
- Tree felling could lead to an increase in sediment in the surface water run-off.
- While the cable trench is open adjacent to a watercourse and at stream crossings, this could lead to an increase in the concentration of suspended solids in the watercourse.

In addition, possible impacts on water quality during construction activity include:

- Concrete operations could contaminate receiving waters.
- Runoff from vehicle washing facilities could lead to contamination of receiving waters.
- Refuelling activities could result in fuel spillages.

The potential impacts on hydrology and drainage that may arise from the proposed development of the wind farm project include impacts on localised flooding patterns and downstream structures as well as cumulative hydrological impacts with neighbouring developments including neighbouring wind farms.

At the temporary compound, the potential impacts are the pollution of surface water from an oil or fuel spillage during construction.

During the operational phase of the wind farm, potential impacts on water quality may arise from the use of lubricants, coolants and hydrocarbons in the operations of the turbine transformers as well as routine maintenance of all plant and equipment.

Knowing the sources of these potential impacts on water quality allows for a range of mitigation measures to be prepared including a surface water management plan, installation of silt management infrastructure such as silt fencing, silt traps and stilling ponds and a water quality monitoring program, among other best practice measures, in order to avoid negative impact on water quality, biodiversity and fisheries. These mitigation measures will be detailed in the EIAR.

4.14 Environmental Aspect: Archaeology, Architectural and Cultural Heritage

4.14.1 Aspects to be Addressed

The assessment will address features and sites of archaeological, architectural and cultural heritage significance. The purpose of the study will be to assess the significance of the receiving cultural heritage environment and to identify and evaluate the magnitude of the impact of the proposed wind farm on the sensitivity of each cultural heritage feature within this environment and on the broader historic character of the landscape. Measures will be proposed to mitigate effects (where possible) so as to allow a fully informed decision to be made by the adjudicating authority.

4.14.2 Assessment Methodology

The assessment will comprise a desk study and field walkover survey and will be based on EPA guidelines and relevant national and international best practice guidelines.

Desk Study
A review of the following information will be carried out to inform the cultural heritage assessment report:

- A review and collation of information obtained from public and statutory consultees, for example nationwide surveys such as the Record of Monuments and Places (RMP) (including National Monuments in State Care, NIAH, RPS and landscape characterisation;
- A review of designated archaeological landscapes;

- A review of the Record of Protected Structures and Architectural Conservation Areas (ACA's) in the Cork County Development Plan 2014-2020;
- A review of the National Inventory of Architectural Heritage (NIAH) building survey sites, NIAH historic gardens and designed landscapes survey sites;
- A review of artefactual material held in the National Museum of Ireland Archives National Museum of Ireland;
- A literature review of published and key references appropriate to the wind farm project including material from local interest groups and historical and archaeological societies;
- Collation of information from similar or other infrastructure projects in proximity to the proposed wind farms, for example EIARs, SEAs, conservation plans, archaeological test assessments and excavations (including the Database of Irish Excavations) Cartographic sources;
- A review of place names folklore/traditions and Gaeltacht areas;
- Other documentary sources;
- A review and interpretation of aerial photographs and LiDAR imagery to be used in combination with historic mapping to map potential cultural heritage assets; and
- A review of existing guidelines and best practice approach will be undertaken.

Field survey

The assessment will include a field assessment of each of the turbine locations and associated infrastructure, the survey will confirm the location of recorded cultural heritage sites and will record their baseline condition; as well as the archaeological potential of all areas within the wind farm project area and areas likely to be affected by the proposed development works. Fieldwork will also identify any unrecorded features of architectural or cultural heritage merit and will assess if they will be impacted by the development. A drone survey will also be undertaken to assess if any potential features with surface expressions not visible at ground level are observable within the boundary. All significant features will be recorded and photographed.

Field walkover surveys will also be undertaken where the access roads and cable routes pass close to recorded monuments and protected structures and where the routes diverge from the paved road and at the jointing bay locations.

Fieldwork along the cable routes will also seek to identify previously unrecorded roadside cultural heritage features (such as milestones, water pumps and stone bridges etc.) and structures.

A survey of alignments and views from stone circles and stone rows located in the surrounding landscape will be assessed.

Setting

Every landscape presents different topographical and environmental conditions, land cover and land usage and as such the location, scale and physical form of each element of wind farm projects and associated works are site specific. As a consequence, the range of potential impacts depends on the individual circumstances of each proposed turbine and the combined contribution of the overall setting of the wind farm.

Based on the Zone of Theoretical Visibility, designated architectural, archaeological and cultural heritage features will be considered up to 5km of the development boundary. All undesignated cultural heritage features will be considered up to 500m of the development boundary. Selected highly sensitive heritage assets of national and international importance will be considered within 30km of the proposed development. The assessment of potential impacts on the setting of such assets will be carried out in consultation with the Landscape and Visual consultants for the proposed development and will include a review of relevant photomontages.

The reporting process ensures that all designations relating to heritage assets as well as cultural heritage features that are revealed through research, field assessment and consultation are clearly articulated. All relevant designated heritage assets will be mapped and lists all relevant cultural heritage constraints will be prepared.

Interactions and consultation

The scale, form and layout of the proposed wind farm development requires a collaborative and iterative design development process with designers, archaeologists and landscape and visual specialists interactively engaged in the process from the outset. Consultation with statutory and non-statutory bodies will also take place throughout the process.

4.14.3 Receiving Environment

There are 15 recorded archaeological monuments located within the constraints boundary for the proposed Ballinagree Wind Farm. These range in date from prehistoric to post-medieval periods with a notable concentration of ritual and settlement monument types typically associated with the Bronze Age (c. 2400-500 BC). Potential also exists for the presence of unrecorded archaeological sites and features to exist within the constraints boundary.

The Record of Protected Structures for County Cork and the National Inventory of Architectural Heritage do not list any of the buildings or structures located within the constraints boundary.

There are two stone circles located within the constraints boundary, one containing five stones and the other fifteen stones, while other examples are located within the surrounding landscape. These are ritual monuments typically interpreted as associated with Bronze Age ritual traditions. The five-stone circle within the constraints boundary is a National Monument in State Ownership (ref. 660).

There are two stone rows located within the boundary. These form part of a distinctive Cork and Kerry group that contain up to six upright stones. These monuments are typically associated with Bronze Age ritual activity and are often found close to cairns and stone circles. Other examples are located within surrounding lands.

Other monuments recorded within the constraints boundary for the proposed wind farm include the following:

- 1 no. standing stones of likely Bronze Age date;
- 4 no. fulachta fia;
- 1 no. cairn;
- 1 no. ringfort from the early medieval period;
- 1 no. holy well site located near the summit of Mushermore Mountain;
- 1 no. hut site on the summit of Mushermore Mountain

Carrigagulla House is a late 18th-century country house which has been designated a recorded archaeological monument. This Country House is located at the south end of the constraints boundary. A redundant record on the Sites and Monuments Record is also located within the project area. This is listed as a ‘potential site’.

Prehistoric lithic monuments have been identified in the area of the proposed wind farm project and the surrounding landscape which contain stones arranged on long axis lines that are likely set on formal ritual alignments across the landscape. These may include views towards astronomical events (e.g. solstice), prominent landscape features or towards other archaeological monuments.

4.14.4 Potential Impacts

Wind farms comprise large upright structures with moving elements. Their scale relative to features in close proximity such as monuments or historical structures can have a visual intrusion on the archaeological and historic landscape. While direct physical impacts can easily be assessed in quantitative terms, the assessment of setting can be subjective and as such is a matter of qualitative and professional judgement.

The assessment will include the implications of the proposed development on the direct physical impact of the wind farm and any indirect impacts on the setting of monuments, historic buildings and cultural heritage complexes.

The potential impacts are briefly described as follows:

- Direct impacts – Construction of wind turbines and access tracks has the potential to impact any underlying archaeological remains.
- The construction phase of the development will consist largely of earthmoving activities such as soil removal for access tracks, borrow pits (if required), turbine bases and hard stand areas. This may have a number of potential negative impacts on the unrecorded and sub-surface archaeological heritage features. The sites are generally located in greenfield agricultural farmland, forested or bogland landscapes. There is a potential for uncovering sub-surface archaeological and cultural heritage features, or features which have no above ground expression, during peat or topsoil removal associated with the construction of the wind farm. Existing farm tracks however will be used where possible.
- Indirect Impacts – Wind farms have the potential to detract from the historic character or adversely impact the setting and visual amenity of a heritage asset affecting the integrity, sense of place, tranquillity and remoteness of that feature. This includes potential impacts on the formal ritual alignments of monuments which may focus on landscape features, other monuments or astronomical events.
- Cumulative Impacts – An assessment will be made on the cumulative impact where necessary, depending on the scale, density and proximity of the turbines within the wind farm and to other wind farms. This will include the consideration of the setting of heritage assets.
- Residual Impacts – these relate to the setting impacts from turbines and associated infrastructure during the lifetime of the wind farm development.

The main potential for negative direct impacts on cultural heritage features occurs during the construction phase. Once the wind farm is operational, the potential for negative direct impacts on archaeological, architectural and cultural heritage assets will be negligible. The proposed development will avoid the known locations of all recorded archaeological sites.

4.15 Environmental Aspect: Aviation and Telecommunications

4.15.1 Aspects to be Addressed

The rotating blades of a wind turbine can occasionally cause interference to electro-magnetically-propagated signals. Such interference could, in theory, affect all forms of electromagnetic communications including:

- Satellite communications
- RADAR
- Cellular radio communications
- Aircraft instrument landing systems
- Air traffic control
- Terrestrial microwave links
- Television broadcasts

In addition, it is possible that houses in the immediate vicinity of the turbines could require some remedial measures in relation to television reception.

The EIAR will include an assessment of any such potential impacts.

4.15.2 Assessment Methodology

An evaluation of the possible effects that the proposed development could have on aviation and existing telecommunications networks will be conducted. A study will be undertaken to analyse the impact of the turbines on telecommunications operator's point-to-point microwave radio links.

This evaluation will include the generation of GIS based telecommunications constraints mapping for the areas affected. The purpose of this mapping is to identify potential negative impacts on the telecommunications network and facilitate the selection of optimum sites and turbine locations by avoiding telecommunication links where possible, and thereby limiting any potential negative impacts on service providers in the area.

The proposed assessment methodology will include:

- Consultation with Irish Aviation Authority, Department of Defence, Commission for Energy Regulation, emergency services;
- Consultation with telecommunications operators to gather the necessary data;
- Preparation of constraint mapping;
- Analyses of the impact of the turbines on telecommunications operators' point-to-point microwave radio links and apply appropriate buffer distances around links and masts where required;
- Discussions with telecommunications operators identifying potential clashes. Operators to provide feedback on initial assessment and to provide information on the importance of the links identified;
- Further specialist investigations will be carried out if the telecommunications operators identify potential impacts; and
- Where necessary, mitigation measures to be agreed with operators including:
  - Turbine relocation
  - Telecommunications link relocation
  - Underground fibre optic cables to replace microwave link
  - Submission of final detailed layout to telecoms operators.
  - Agree any layout alterations following final detailed assessment by telecoms operators or agree suitable mitigation measures if necessary.

Impacts on aviation will be addressed following detailed discussions with the Irish Aviation Authority.

In relation to the cables, mapping of telecommunications cables, which could potentially be affected by the installation of the cables associated with the proposed Ballinagree Wind Farm, will be obtained and potential impacts assessed.

4.15.3 Receiving Environment

An initial desktop study has been conducted to identify telecommunication infrastructure in the area of the proposed project. The Comreg site viewer[4] identifies a number of telecom masts in the surrounding proximities of the project.

4 no. masts are located ca. 2 km south of the project, west of the town of Ballinagree. 11 no. masts are located in proximity to the settlement of Millstreet, north west of the project. Other outlying masts have been identified to the south of the project at Macroom, to the east of the project at Donoughmore and New Tipperary and to the north east of the project at Mount Hillary and the townland of Glannaharee East.

Should an operator raise concerns, and the impact cannot be avoided by amending the layout of the wind farm, we will engage directly with the operator to quantify the interference impacts of the wind farm development and identify a likely telecommunications mitigation solution. This approach is proving successful on similar wind farm projects.

4.15.4 Potential Impacts

An evaluation of the possible effects that the proposed development could have on aviation and existing telecommunications networks will be conducted. A study will be undertaken to analyse the impact of the turbines on telecommunications operator's point-to-point microwave radio links.

This evaluation will include the generation of GIS based telecommunications constraints mapping for the areas affected. The purpose of this mapping is to identify potential negative impacts on the telecommunications network and facilitate the selection of optimum sites and turbine locations by avoiding telecommunication links where possible, and thereby limiting any potential negative impacts on service providers in the area.

The Irish Wind Energy Association 2012 guidelines, "Best Practice Guidelines for the Irish Wind Energy Industry", indicate that wind turbines within 20 km of a radio navigation aid have the potential to cause electro-magnetic interference with these signals. It is possible that houses in the immediate vicinity of the turbines could require some remedial measures in relation to television reception.

In practice, such measures are not difficult to implement, are relatively inexpensive and if necessary, will be undertaken by the developer in conjunction with RTÉ.

[4] http://siteviewer.comreg.ie/#explore

4.16 Environmental Aspect: Landscape and Visual Impact

4.16.1 Aspects to be Addressed

The landscape and visual assessment report will appraise the existing landscape character of the project area and its wider setting in order to assess the likely landscape, visual and residential amenity impacts arising from the proposed development. A Study Area of 30km is defined as set out in best practice guidance recently updated by Scottish Natural Heritage 2017. A suitable, bespoke study area will be proposed following further detailed analysis of the project. Potential mitigation measures are also included. Aspects to be addressed in the report are:

- ✓ Receiving environment, covering details on:
  - Wider landscape context
  - Localised site context.
  - Landform, landcover, land use patterns and trends
  - Key/unique landscape elements and features
  - Defining attributes of the wider landscape

- ✓ Landscape character, covering details on:
  - Character as outlined in CDP
  - Associated landscape values
  - Sensitivity levels within the landscape
  - Statutory designations
  - Landscape designations
  - Scenic/amenity routes
  - Views and prospects
  - Features of natural and built heritage

- ✓ Landscape Policy Context
  - Relevant policy objectives within Cork CDP and LAPs
  - Relevant policy objectives within neighbouring counties within the 30km Study Area (Objectives appendicised).

- ✓ Visual context
  - Zone of Theoretical Visibility
  - Viewshed Reference Points (Detailed findings appendicised).
  - Route Screening Assessment (Detailed findings appendicised).

Assessment of these aspects will ultimately inform potential landscape, visual and amenity aspects, residual impacts, and in turn appropriate mitigation measures to ensure impacts are not significant.

4.16.2 Assessment Methodology

The LVIA Methodology can be summarised as undertaking the following key tasks:

- Desktop study of the project area in relation to its overall wider context;
- Visit to the project area and its environs;
- Visit to assess residential amenity impacts;
- Visit to assess route screening;
- Defining the baseline general landscape character, setting, and condition in relation to the position of the proposed development;
- Engagement with relevant landscape and amenity planning designations with the study area as outlined in the Cork County Development Plan 2014-2020 and any relevant policy within neighbouring county Kerry which falls within the 30km study area;
- Identification of quality and types of views in the areas;
- Establishing the extent of the visual envelope, i.e. the potential area of visibility of the project area in the surrounding landscape;
- Identification and evaluation of key components of the proposed development;
- Assessment of potential landscape and visual impacts, and residual impacts;
- Assessment of potential cumulative impacts with proposed/existing developments in the area;
- Preparation of Zone of Theoretical Visibility Maps (ZTVs) to a radial distance of c.30km from the project area; and
- Consideration of mitigation and enhancement measures.

The LVIA methodology is guided by the following guidance:

- Department of Environment, Heritage and Local Government 2006, Wind Energy Development Guidelines for Planning Authorities.
- Department of Housing, Planning and Local Government 2019, Draft Revised Wind Energy Development Guidelines.
- Environmental Protection Agency, 2002, Guidelines on the information to be contained in Environmental Impact Statements.
- Environmental Protection Agency, 2003, Advice Notes on current practice in the preparation of Environmental Impact Statements.
- Environmental Protection Agency, 2015, Draft Revised Guidelines on the information to be contained in Environmental Impact Statements.
- Environmental Protection Agency, 2017, Draft Revised Guidelines on the information to be contained in Environmental Impact Statements.
- Environmental Protection Agency, 2015, Draft Advice Notes on current practice in the preparation of Environmental Impact Statements.
- Landscape Institute, and Institute of Environmental Management & Assessment, 2013, Guidelines for Landscape and Visual Impact Assessment, 3rd Ed.
- Scottish Natural Heritage, 2017, Visual Representation of Wind Farms, Version 2.2.

The impact significance criteria used in the assessment are based on the EPA Guidelines, 2002 and Advice Notes, 2003 with reference also to EPA's draft 2017 revised guidelines and the 2015 draft Advice Notes.

4.16.3 Receiving Environment

The proposed project extends across an area comprising commercial forestry, pasture and bog land. The general elevations range from 250m at Ballinagree East, to 630m at Musheramore Mountain in the northwest of the project area.

The proposed project is located in an area considered to be 'Open for Consideration' for wind farm development as defined in the Cork County Development Plan 2014. There are a number of wind farms in the vicinity of the proposed project most notably Boggeragh Wind Farm to the north, Bawnmore to the south and Gneeves and Coomacheo to the west.

The majority of the proposed project is identified as being located within the 'Ridged and Peaked Upland' Landscape Character Area as defined by the County Development Plan. The 'Ridges and Peaked Upland' Landscape Character has a 'medium' landscape value and sensitivity. The Duhallow Way dissects the proposed project along the Millstreet Road which is also a designated scenic route as indicated in the Cork County Development Plan.

4.16.4 Potential Impacts

In the European Landscape Convention, landscape is defined as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. The term "landscape" is thus defined as a zone or area as perceived by local people or visitors, whose visual features and character are the result of the action of natural and/or cultural factors. Recognition is given to the fact that landscapes evolve through time and are the result natural and human activities.

Landscape and visual impact assessment has two separate but closely related aspects. The first is visual impact, i.e. the extent to which the wind turbines in the landscape can be seen. The second is landscape character impact, i.e. effects of the wind turbines on the fabric or structure of the landscape as perceived by people. Landscape character is derived from the appearance of the land and takes account of natural and man-made features such as topography, landform, vegetation, land use and built environment and their interaction to create specific patterns that are distinctive to particular localities.

The proposed wind turbines will be large structures with the potential to have significant landscape and visual impacts. The development of wind farms, including associated infrastructure such as tracks and ancillary buildings, may have a major impact on the surrounding landscape.

Key to the development of the project will be the need for clear communication of the scale and extent of the proposed project. Clear and concise mapping of the existing areas of landscape and visual sensitivity together with photomontages of the proposed wind turbines will be essential in demonstrating the nature and extent of the development.

Zone of Theoretical Visibility Mapping (ZTV's) will be prepared based on the Department of the Environment, Heritage and Local Government's 'Wind Farm Planning Guidelines'. The ZTV's will illustrate the study area extending to 30km around the proposed project area and highlight the areas where the proposed turbines will theoretically be visible from, as well as the cumulative visual impact arising from the existing Boggeragh, Bawnmore, Gneeves and Coomacheo Wind Farms. These ZTV's do not take into consideration vegetation cover, changing weather conditions or the mitigating effect of distance and therefore illustrate the worst-case scenario of visibility.

Estimation of the visual impact of the proposed scheme on the landscape will be based on the visual presence of the turbines, their aesthetic impact the landscape context and the significance of the impact. The assessment will examine potential landscape and visual impact of the proposed turbines on designated landscape, properties, roads, recreation and tourism areas, including;

- Direct effects on landscape features, views, routes and areas described in the County Development Plans and Landscape Character Assessments. The review of the landscape setting will account for a 30km study area from the project boundary, thereby including parts of County Kerry. Assessments of and objectives for landscape character will be looked at in the Kerry County Development Plan to ensure a consistent and integrated appraisal of the area within this 30km area.
- Potential changes to landscape and townscape character referring to in the County Landscape Character Assessments noting subtle effects that contribute to the experience of more intangible landscape characteristics. Landscape types, significance/value, sensitivity and capacity for change will be examined.
- Effects on designated landscapes, views, conservation sites (including significant archaeological sites) and other special areas of interest.
- Effects during construction and decommissioning.

Viewshed reference points (VRP) from the surrounding landscape will be identified from the desktop studies outlined above and will be verified on site. Photomontages from these viewshed reference points will be prepared for the proposed wind turbines, together with a wireframe and photomontage views of the other planned/permitted wind turbines in the landscape, to assist in demonstrating the levels of visual impact.

5. CUMULATIVE IMPACTS, INDIRECT IMPACT AND INTERACTION OF EFFECTS

5.1 Aspects to be Addressed

The cumulative impact of the proposed Ballinagree Wind Farm with other projects which are either existing, permitted or pending planning permission, or for which there is information in the public domain, at a sufficient level of detail to allow assessment, will be addressed. An example of a project within the public domain can be projects that are listed in the County Development Plan or National Development Plan. Indirect effects and effects in different environmental media will be addressed.

The cumulative effects from the construction of the wind turbines, cabling and haul route alterations will also be assessed.

5.2 Cumulative Assessment Methodology

The assessment methodology will be based on the EPA guidance and the EU guidelines, 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions', published by the Office for Official Publications of the European Communities in May 1999.

As part of scoping the studies required to assess the impacts of the proposed Ballinagree Wind Farm in the different environmental media, the potential for significant cumulative and indirect impacts and interactions will be examined and any such potential impacts will be identified. Where the potential for significant cumulative and indirect impacts and interactions is identified, such impacts and interaction of impacts will be included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental media and aspects of the project. The cumulative and indirect impacts and interaction of impacts will be presented in the chapters of the EIAR which address the most relevant environmental media.

The matrix and expert opinion approaches, as outlined in the EU Guidelines, will be used in the identification of the potential for significant cumulative and indirect impacts and interactions. A matrix of potential interactions will be prepared. Modelling and carrying capacity analyses will be used to evaluate impacts.

5.3 Receiving Environment

There is a significant number of wind energy projects located in the surrounding landscape of the proposed Ballinagree Wind Farm which will be considered for cumulative impact. These include the following constructed wind farms:

- Boggeragh Wind Farm
- Bawnmore Wind Farm
- Carriganimma Wind Farm
- Carraigcannon Wind Farm
- Gneeves Wind Farm
- Caherdowney Wind Farm
- Clydaghroe Wind Farm
- Coomacheo Wind Farm

Furthermore, projects with planning permission for wind energy developments which have not yet been constructed will also be considered. This includes the Esk wind Farm, located to the north east of the Boggeragh wind farm.

Other planned, permitted or constructed projects in the area will be considered for potential cumulative impact. Furthermore, significant projects within the region will also be considered for potential cumulative impact.

5.4 Potential Impacts

If other projects of similar scale and type are under construction at the same time as the proposed Ballinagree Wind Farm, there would be potential for cumulative impact due to increased construction traffic, increased demand on construction materials and skills as well as potential for increased runoff to local streams, potential for in-combination visual impact and potential for increased noise impacts.

Positive cumulative impacts are also possible, for instance, improvement to air quality as a result of renewable energy projects and achievement of national and international renewable energy generation targets.

Please send all responses to: ballinagreewindfarm@ftco.ie

or respond by post to:
Fehily Timoney & Company,
Core House,
Pouladuff Road,
County Cork

FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX A

LIST OF CONSULTEES

Cork County Council
Archaeologist
Conservation Officer
Area Engineer
Planning

Government Departments
Minister for Housing, Planning and Local Government
Minister for Culture, Heritage and the Gaeltacht (DAU)
Minister for Agriculture, Food and the Marine
Minister for Communications, Climate Action and Environment
Minister for Transport, Tourism and Sport

Telecommunications and Aviation
Nova Telecom
Skylink Communications
Imagine
Munster Broadband
Digiweb
Ripplecom
Magnet Networks
BT Communications Ireland Ltd
RTE
Now Virgin Media Ireland
Eir (Eircom)
Vodafone (Netshare)
Three
ESB Telecoms
TETRA Ireland Ltd.
TowerCom Ltd.
Virgin Media
Pure Telcom
Sky Broadband Ireland

Other Interested Bodies
Inland Fisheries Ireland (IFI)
Transport Infrastructure Ireland (TII)
Environmental Protection Agency (EPA)
The Heritage Council
An Taisce
An Chomhairle Ealaíon (Arts Council)
Failte Ireland
Irish Aviation Authority
Health and Safety Authority
Irish Water
An Bord Pleanála
Minister for Defence
Commission for Regulation of Utilities
National Roads Authority
Office of Public Works
Health Service Executive (HSE)

Geological Survey Ireland (GSI)
Mountaineering Ireland
Office of Public Works (OPW)
Southern Regional Assembly
Biodiversity Ireland
Irish Wildlife Trust
Bat Conservation Ireland
Butterfly Conservation Ireland
Birdwatch Ireland
National Parks and Wildlife Service (NPWS)
Irish Raptor Study Group
Irish Environmental Network
Teagasc
Gas Networks Ireland
Met Eireann
Eirgrid
ESB Networks
Sustainable Energy Authority Ireland
National Transport Authority
Irish Wind Energy Association
Geographical Society of Ireland
An Garda Siochána - Macroom Branch
Environmental Sciences Association of Ireland
Irish Peatland Conservation Council
Forestry Service
Cork Airport Authority
Macroom Trout Fly Anglers
Angling Council of Ireland
IRD Duhallow
Aubane Community Action Group
Ballinagree Community Development Group
Macroom & District Environmental Group
Cork County Mayor
Andrias Moynihan TD
Michael Moynihan TD
Cllr Martin Coughlin
Cllr Ted Lucey
Cllr Eileen Lynch
Cllr Michael Creed
Cllr Michael Looney
Cllr Gobnail Moynihan

FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX B

Ballinagree Wind Farm
Newsletter 3 – Summer 2020

Ballinagree
Wind farm

NEWSLETTER 3 SUMMER 2020

Ballinagree Wind Farm

Project

COILLTE
GROW · TRANSFORM · SUSTAIN

Brookfield

www.ballinagreewindfarm.ie

Front Cover image: Looking south east across the project's Study Area towards Carrigagulla from the lower slopes of Musheramore

1. INTRODUCTION

The proposed Ballinagree Wind Farm project is a co-development between Coillte Renewable Energy (Coillte) and Brookfield Renewable Ireland. This is the third Newsletter released on the proposed project. From the outset of our engagements on this project, we have strived to carry out the design process in a different way to previous projects of this type. The dedicated project Community Liaison Officers, David and John and Project Managers, Edwina and Michael, are doing this by actively placing a fundamental focus on inclusion and partnership with stakeholders. We started this process mid-2019 via door to door conversations with those who live closest to the project study area and prior to the start of any detailed design work. These conversations highlighted different opinions and questions and helped to inform the second project Newsletter which was distributed door to door from the end of 2019. Both the Project Managers and Community Liaison Officers have undertaken this to ensure that accurate project information is shared and that local residents and stakeholders have an opportunity to address queries with the project team. We have also called to talk with local residents on Saturdays and in the evening time in order to get opinion and feedback from as much of the community as possible.

The current Government restrictions in place to combat the Covid-19 pandemic has led us to curtail our face to-face visits for a while. However, we are committed to continuing our approach of involvement and inclusiveness in our engagement and we are working hard on innovative solutions which will still enable the project team to keep the community updated. As our face to face conversations have had to be paused this, the third project Newsletter, is being issued to provide a detailed update on how work on the project is progressing.

The project information contained within this newsletter has been prepared to:

- Describe some of the ongoing technical and environmental studies for the project's design and environmental assessment process currently underway;
- Outline the steps to be taken prior, during and after the planning application to be submitted to the Consenting Authority;
- Present all current information and invite feedback from local residents and stakeholders, given the restrictions currently in place inhibiting face to face engagement. The project team would encourage and welcome anyone with questions or comments to contact us;
- Explore possible collaboration opportunities that the project may present for local communities and initiatives;
- Set out information on next steps and project timeline.

Looking north across the project's Study Area towards Musheramore

Why Onshore Wind?

Onshore wind energy makes sense for Ireland for many reasons. It's a clean fuel source which does not pollute the air like power plants that rely on combustion of fossil fuels, such as coal or natural gas. Unlike conventional power plants, wind turbines don't produce atmospheric emissions that cause acid rain or greenhouse gasses. Wind energy is a free domestic natural resource, produced in abundance in Ireland. As an operating wind farm occupies such a relatively small proportion of an overall site area, approximately a 3% footprint, many other land uses can co-exist such as commercial forestry, farming, recreation and biodiversity management.

The Government declared in May 2019 that Ireland was in the midst of a climate and biodiversity emergency. The Environmental Protection Agency (EPA) has stated that mean annual temperatures in Ireland have risen by 0.7° Celsius (C) over the past century and are likely to rise by 1.4°C to 1.8°C by the 2050's and by more than 2°C by the end of the century due to climate change. Climate change refers to the change in climate that is attributable to human activity arising from the release of greenhouse gases in particular from the burning of fossil fuels (coal, oil, peat) for transport, electricity generation and agriculture.

As Ireland's largest landowner, Coillte has the capacity and with that the responsibility to contribute significantly to Ireland's efforts to combat climate change and reduce carbon emissions. Coillte's forestry business sequesters 1.1m tonnes of carbon annually. With a land asset suitable for wind farm development, this puts Coillte at the forefront of being able to deliver on the Government's Climate Action Plan (June 2019) announcing a target of 70% of Ireland's electricity from renewable sources by 2030.

Brookfield Renewable Ireland is one of the largest owners and developers of renewable assets in Ireland holding 10 % of the operating wind farms in Ireland, employing approximately 100 people in Cork and across their Irish wind farms. Brookfield's development pipeline will continue to bring new renewable energy onto the system further contributing to decarbonisation of the Irish economy.

Sliabh Bawn Wind Farm, Co. Roscommon

A firm commitment from the Irish Government on Climate Action is forming part of climate change legislation currently being publicised by our policy makers;

- A target of net zero economy-wide greenhouse gas, GHG, emissions by 2050.
- A target for the renewable share of electricity generation of 70% by 2030.
- Provision for five-yearly carbon budgets, consistent with the emissions reduction pathway to 2030 and 2050.

The amount of wind energy installed in Ireland has reached 4100 MW generated by 350 wind farms and the Irish Government has recently published 'Project Ireland 2040: National Development Plan 2018 – 2027', which outlines the need for an additional 3,000 - 4,500 MW of renewable energy as an investment priority. The further development of renewable energy sources is a vital component of Ireland's strategy to tackle the challenges of combating climate change and ensuring a secure supply of our future energy needs. The proposed Ballinagree Wind Farm project is being brought forward, in part, as a response to these challenges and we feel it has the potential to contribute greatly to this global cause.

Why This Project?

Identifying a site suitable for a wind farm takes into consideration many different inputs. The suitability of the Study Area for this project can be attributed, in part, to the following characteristics:

- The Study Area is located in an area designated as 'Open to Consideration' for wind energy in the current Cork County Development Plan.
- The Study Area is not designated as a Natura 2000 site. It is not within a Special Area of Conservation (SAC), a Special Protection Area (SPA) nor a Natural Heritage Area (NHA), although some of these areas do exist nearby.
- The Study Area is in an accessible location for connection to the National Electricity Grid via existing electrical substations in the local area.
- There are good annual average wind speeds in the Study Area.
- Setback distances from houses can be achieved to align with the latest government guidance. The project team has already committed to a minimum setback of 750 m between a dwelling and a proposed turbine location.
- There is a limited network of existing forestry and farm roads within the Study Area that can be utilised.

The Project Team

The project team directly involved in the proposed Ballinagree Wind Farm project includes a Coillte Project Manager (Michael O'Connor), a Project Manager from Brookfield Renewable Ireland, (Edwina White), two Community Liaison Officers (John Lyons and David Eves) as well as a number of specialists in the areas of grid, planning and policy, and wind resource.

Fehily Timoney and Company (FT) is a leading Irish engineering, environmental science and planning consultancy with offices in Cork, Dublin and Carlow. FT leads a multidisciplinary team appointed in January 2020 to carry out studies, design and preparation of the planning application and Environmental Impact Assessment Report (EIAR) on behalf of the project. FT has wide ranging experience in all aspects of the feasibility assessment, environmental impact assessment, planning, design and construction of wind farm and other energy related projects. The practice was established in 1990 and currently has c.70 members of staff, including engineers, scientists, planners and technical support staff. FT delivers projects in Ireland and internationally in their core competency areas of Waste Management, Environment and Energy, Civils Infrastructure, Planning and GIS and Data Management.

About The Project Study Area

The Study Area for the project is located within both forested Coillte and privately owned lands in an area south-east of Mushermore mountain and just north, north/east of Ballinagree village between the towns of Macroom and Millstreet. The Millstreet to Rylane road (The Butter Road) runs through the Study Area and The Duhallow Way also traverses the northern part of the Study Area in an east/west direction.

The Study Area is located east of the Mullaghanish to Musheramore Mountains Special Protection Area designated for the protection of breeding Hen Harrier. The site has an upland hilly/undulating topography. The River Laney flows through the Study Area, which is dominated by varying aged conifer plantation, agricultural grassland and wet grassland.

The following environmentally designated areas occur within 15 kilometres of the Study Area:

- Mullaghanish to Musheramore Mountains SPA (004162), west of the Study Area:
  - » This is a Natura 2000 site selected for the ''protection of hen harrier''.
- Gearagh SPA (004109), approximately 13 km to the south of the Study Area:
  - » This is a Natura 2000 site selected for "the protection of wigeon, teal, mallard and coot".
- The Gearagh SAC (000108) approximately 15 km to the south of the Study Area:
  - » This Natura 2000 site was selected for the presence of the following habitats and species: Floating River Vegetation, Old Oak Woodlands, Alluvial Forests and Otter.
- Mullaghanish Bog SAC (001890) approximately 15 km to the west of the Study Area:
  - » This is a Natura 2000 site selected for the protection of Blanket Bogs.
- The Gearagh (Ramsar site no. 472) approximately 13 km to the south of the Study Area:
  - » Wetlands selected to support a ''*nationally important population of whooper swan''.*
- Natural Heritage Area (NHA – 002447) Immediately north of the Study Area;
  - » Peatlands – Selected for upland blanket bog habitat.

The Study Area and surrounding landscape also contains a high concentration of Bronze-aged features. Some of these have historical ritual and visual alignments across the wider landscape.

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Female Hen Harrier in flight

Castlepook Wind Farm in the Ballyhoura Mountains.

2. PROPOSED DEVELOPMENT

Following project assessments as part of the Design Iteration 1 process the project team is currently considering the Study Area under the following parameters:

- Capacity for up to 19 wind turbines;
- Associated internal underground cabling and grid connection cabling;
- Proposed overall turbine envelope height (when a turbine blade is pointing skyward) of up to 185 metres and associated foundations and hard-standing areas;
- An electrical substation with a control building and associated electrical equipment;
- Borrow pits to source construction stone on-site for road upgrade and construction;
- A permanent anemometry mast up to a height of 100 metres to measure wind speed and direction;
- Upgrade of existing and provision of new site access roads and associated drainage;
- Construction compounds; and
- Biodiversity enhancement and conservation areas.

The project also consult with Eirgrid and at this stage, it is proposed that the project will connect to the national electrical grid at either the existing 220kV Clashavoon substation, which is located approximately 5km north-east of Macroom, or the 220kV Ballyvouskill substation, which is located approximately 6.5km south of Millstreet. The project team are currently in the process of assessing the different route options for connecting the proposed project to the Clashavoon or Ballyvouskill substations via an underground cable.

3. PROJECT DESIGN PROCESS

The Study Area, set out in the second project newsletter and available on the project website, www.ballinagreewindfarm.ie, is currently being assessed by the project team. This detailed assessment has been underway since January 2020. Some general seasonal dependent ecology work has also been underway since 2017/2018. All field work, with the exception of limited and seasonal dependent ecology surveys, is paused at this time in line with the Government and HSE protocols surrounding the Covid-19 pandemic until further updates and/or restrictions are lifted.

Through this assessment, the Project's Study Area is reduced down into a working area from which a layout design, including preliminary wind turbine locations, is arrived at. Many sections of the initial Study Area have now been excluded in order to form the Working Area.

The Working Area includes:

- Setback distance from both the Mullaghanish to Musheramore Mountains Special Protection Area (SPA) and the National Heritage Area (NHA) to the north of the Study Area.
- Setback from dwellings – 750 m minimum
- Avoidance of areas of steep ground slope
- Setback from watercourses – 75 m
- Avoidance of Coillte designated biodiversity areas
- Avoidance of areas with excessive deep peat
- Optimisation of design for visual impact
- Setback from public roads
- Setback from overhead powerlines
- Setback from, and alignment with, archaeological/ cultural heritage features

Furthermore, the locations of the proposed wind turbines and all other proposed infrastructure is informed by rigorous site investigations and assessments which include:

- Ecological Surveys
- Ornithological Surveys
- Geotechnical, Hydrological and Geological Site Investigations
- Shadow Flicker Modelling
- Noise Modelling
- Archaeological Surveys
- Landscape and Visual Assessment
- Wind Resource Modelling

The Working Area is continuously updated throughout the design process. We are currently at Design Iteration One. There are still two more design stages to be undertaken based on the findings of further site investigations and based on stakeholder feedback. Future design stages are likely to reduce the Working Area further as additional constraints are taken into consideration.

Design Iteration One is now available to view on the project website, **www.ballinagreewindfarm.ie**

Shadow Flicker

On Wind Farms, shadow flicker occurs at certain times of the day when the sun is very low in the sky, and where the movement of blades can periodically reduce the daylight coming through a window for example, causing the daylight to appear to flicker. Technology now allows for a wind farm project to comply with a zero shadow flicker policy, through detailed analysis and planned curtailment of the turbines. Current legislation limits allowable shadow flicker to a maximum of 30 minutes a day or 30 hours per year at residential properties. This project is striving towards a zero shadow flicker policy at residential properties in its design.

Telecommunications

This project is being designed with existing radio, internet and television receptions in mind. Details of the potential project layout shall be fully assessed and submitted to the planning authority for agreement prior to the commissioning of any turbines. This will follow consultation with all the relevant governing bodies and any known telecommunication companies providing services in the area.

4. THE PLANNING PROCESS

Development projects, such as wind farms, require a detailed Environmental Impact Assessment Report (EIAR) to be submitted with the planning application. In order to ensure that the environmental assessment process is appropriate to the project and locality, project specific information will be prepared by the project team and circulated to statutory and non-statutory consultees in addition to near neighbours.

Regular consultation with local residents will also continue throughout the three design stages and the environmental assessment process, focusing on those residents within up to 3 km of the project's Working Area.

We feel it is very important that open dialogue on key aspects of the project continues. The project team are always open to feedback both on how best to keep community members up to date on the design process and on project progress overall.

The EIAR will focus on the following areas, will accompany the planning application and will be available for viewing and downloading. The below list is not exhaustive.

Chapter 1 Introduction

Chapter 2 Description of the Proposed Development

Chapter 3 Civil Engineering

Chapter 4 Alternatives

Chapter 5 Population and Human Health

Chapter 6 Biodiversity

Chapter 7 Ornithology

Chapter 8 Water

Chapter 9 Land and Soil

Chapter 10 Noise and Vibration

Chapter 11 Shadow Flicker

Chapter 12 Landscape

Chapter 13 Cultural Heritage

Chapter 14 Air and Climate

Chapter 15 Material Assets

Chapter 16 Interaction of the Foregoing

Chapter 17 Schedule of Environmental Mitigation

Planning Application

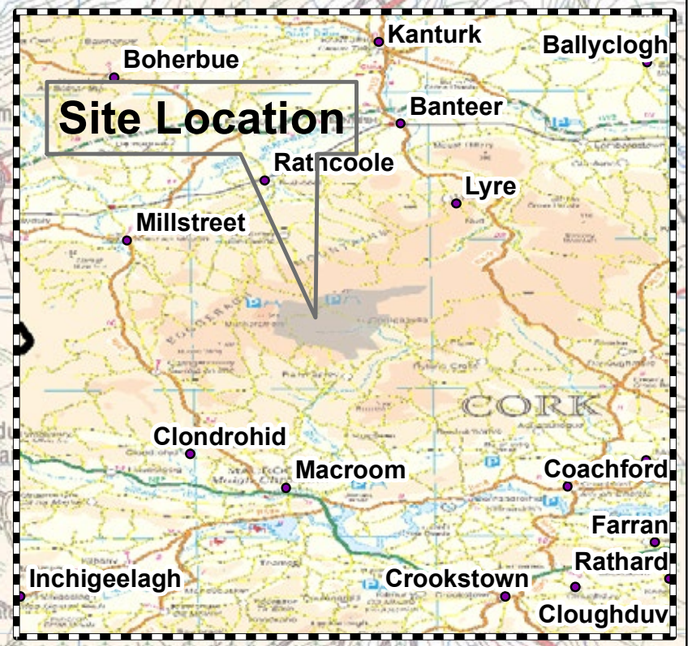
It is currently envisaged that an application for planning permission for the proposed Ballinagree Wind Farm project will be submitted directly to An Bord Pleanála as the project is of a scale to be deemed Strategic Infrastructure development (SID). Under current legislation, a wind farm project of scale is one capable of generating electricity in excess of 50 Mega Watts (MW). The current project timeline predicts a planning application being submitted in December 2020. This date has been somewhat impacted by the Covid-19 working restrictions and could potentially be delayed as a result.

In preparation for submission of this planning application, the design team requested a pre-application consultation meeting in March 2020 with representatives of Cork County Council's Planning department and with An Bord Pleanála in order to discuss the application in relation to proper planning and sustainable development.

Along with the previously mentioned EIAR, a Natura Impact Statement (NIS) will also be prepared and submitted with the planning application. A separate website will be created as required by An Bord Pleanala to present the full application and all the supporting documents and drawings.

There is a very useful frequently asked questions section on An Bord Pleanála's website at **www.pleanala.ie/sid/sidpp.htm#q7** which sets out a guide to how public participation and comments on any SID application can be done. Any person or body may make submissions on the project to the Board while the documents are available for viewing after the application has been submitted.

Proposed Ballinagree Wind Farm Project
Design Iteration 1



Legend

- Towns
- Proposed Turbine Locations
- Proposed 100m Met Mast
- Existing Met Mast
- Existing Forest Roads
- Study Area

5. CULTURAL HERITAGE

The Ballinagree area and the wider Macroom and Millstreet areas are rich in archaeology and some extremely interesting examples are located in the landscape within the environs of the Study Area for the proposed Ballinagree Wind Farm project. John Cronin & Associates archaeological consultancy, established in 2000 with a base in Cork City, has been commissioned to map and survey the known monuments within the Study Area and to advise the project team during the design process to ensure that all areas with sensitive archaeological and/or cultural heritage features are preserved and treated correctly. The project archaeologists are also scheduled to undertake field-walking and drone surveys in order to establish if any unrecorded monuments may exist in the area.

There are a number of stone circles, stone rows and wedge tombs located within the Study Area of the project. These consist of monument types associated with ritual activity dating to the Bronze Age (2400-500 BC).

Stone circles comprise rings of free-standing upright stones, symmetrically arranged so that one stone set on its side (the axial stone) is set directly opposite the two tallest stones which form an entrance into the structure. The stone rows within the project Study Area form part of a distinctive Cork and Kerry group that contain up to six upright stones, typically about 2m in height, and are often aligned on a northeast to southwest alignment.

Standing stones viewed in the Study Area comprise single upright stones and may have functioned as prehistoric burial markers, commemorative monuments or indicators of route ways or boundaries.

Wedge tombs surveyed in the Study Area comprise stone-built megalithic tombs containing a burial gallery, sometimes with a small end-chamber, and there is a notable concentration of these monuments in County Cork. The low structures are generally broader and higher at the front and typically face in a westerly direction. Evidence suggests that they were constructed between 2,500 and 2,000 BC and represent the last phase of megalithic tomb building.

Other monuments within the Study Area of the project include Bronze Age cooking sites known as fulacht fiadh as well as later sites such as holy wells and enclosed Early Medieval farmsteads, known as ringforts, some of which may contain associated underground structures known as souterrains.

Carrigagulla House, in the southern portion of the Study Area, is a late 18th-century country house which has been designated a recorded archaeological monument. There is potential also for the presence of unrecorded archaeological sites and features to exist within the Study Area such as stone hut remains and historical field systems. The locations of such features will be carefully considered during the assessment and design of the project. This consideration will include review of historical maps and field surveys. Potential for facilitating greater public access to the locations of some of these monuments within the Study Area can also be considered as part of the design process. The cultural heritage of the area extends beyond known monuments and can include local folklore and traditions that may form an oral record of historical and archaeological activities not otherwise recorded. **Any information on local traditions associated with the lands in the environs of the proposed wind farm would be most welcome and will be shared with the project archaeologists to ensure that they are included in the studies.**

Stone circle at Carrigagulla

Stone circle in project's Study Area

6. NOISE

The 2006 Wind Energy Development Guidelines (2006 WEDG's) provide details on noise limits for wind farm developments in Ireland. These guidelines are currently under review and the draft Wind Energy Development Guidelines (draft WEGs) were published in December 2019. These guidelines have been consulted on by the public and professionals in the noise industry alike. This is a welcome development as the 2006 WEGs are often criticised as not being up to date with current technology used by wind farm developers today. The noise limits in the new draft WEGs afford greater protection to residents living in the vicinity of proposed wind farms than the 2006 WEGs do. Furthermore, the draft WEGs also consider special audible characteristics. The draft WEGs are currently being debated, reviewed and refined following input from all interested parties. Further information can be obtained on the Department's website as follows: www.housing.gov.ie

The main sources of noise from a wind turbine include aerodynamic noise (rotating blades in the air) and mechanical noise (gearbox and generator).

From the outset, the project team have committed to using the noise impact assessment procedure in the new draft WEGs as well as the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (2013).

ENVIRONMENTAL NOISE IMPACT ASSESSMENT PROCEDURE BEING UTILISED FOR THE PROPOSED BALLINAGREE WIND FARM PROJECT

As we are currently at the first of three design iterations, initial noise modelling is underway. The noise assessment process generally follows the below points.

Task	Status
Define Study Area using computer modelling Preliminary Noise Model (includes existing and proposed developments in the general area)	Complete
Identify areas in the Study Area to establish baseline/ background noise monitoring locations	19 Locations identified. The deployment of monitoring data has been delayed due to the COVID 19 concerns and restrictions.
Measure Background Noise Levels concurrently with wind speed and direction	Delayed due to COVID 19 concerns and restrictions.
Use Background noise data to derive noise limits	This will commence once permission is received from residents and COVID 19 restrictions are lifted or permission is provided in line with Government guidance.
Use computer modelling to predict noise from development • International Standard • Input parameters in keeping with IOA Guidelines • Turbine noise data supplied by turbine manufacturer • Cumulative impacts	To be completed in finalising Design Iteration 1
Compare predicted noise levels against noise limits • Compliance demonstrated (√) • Non-Compliance (x) » Mitigation » Update or change wind turbine layout or wind turbine technology	To be completed in finalising Design Iteration 3 (DI3)
Depending on the findings of the full noise study as well as other environmental considerations, the layout of the proposed wind farm can change.	To be completed in finalising Design Iteration 3 (DI3)
Once the layout has been finalised: In addition to operational noise predictions, construction noise predictions will also be undertaken and the Noise chapter of the Environmental Impact Assessment Report will be prepared.	To be completed prior to planning application submission

Did you know:

The noise consultant has to discount the noise emitted by existing turbines in the area in order to establish true back ground noise. Wind Farms are limited in the amount of noise they can emit above this lower background level.

Typical noise monitor used to measure background noise levels during the design process

7. COMMUNITY BENEFIT AND INVESTMENT PROPOSAL

Wind Farms and the local Community

Both Coillte Renewable Energy and Brookfield Renewable Ireland recognise that any wind farm development means there will be change for an area and that this change is experienced mostly by those living in that local area. For this reason, we commit to ensuring that local communities should benefit from having a wind farm in their locality and that opportunities for local community investment in any successful project are also explored.

From our door to door conversations to-date we understand that not everyone is open to the prospect of exploring what benefits a project such as this could offer at this stage of the development process. However, this project does have the potential to bring significant positive benefit to the local community. The project will contribute annual rates to the local authority and will provide avenues to explore the opportunity for local community investment. As with all wind farm projects which Coillte Renewable Energy and Brookfield Renewable develop, a community benefit fund will be put in place for the lifetime of the project to provide direct funding to those nearest neighbours and local communities.

What will the community benefit fund look like?

There are currently two very important areas of Government policy and market support being developed which are nearing completion and which will have a bearing on the establishment of future community benefit funds. These are the updated Wind Energy Guidelines and the new Renewable Energy Support Scheme (RESS). The RESS 1 Term's and Conditions were announced in February of this year and we hope to see finalised Wind Energy Guidelines by the end of 2020. These policies will provide clarity on the Government requirements on future community benefit funds for renewable energy projects.

We will fully take into account these two important polices as we present our community benefit proposal for the proposed Ballinagree Wind Farm.

Based on RESS 1 guidelines, the project team expect that for each megawatt hour (MWh) of electricity produced by any future wind farm, the project owners will contribute €2 into a community fund for the RESS contract period i.e. first 15 years of operation and €1 per MWh for the remaining lifetime of the wind farm.

If the project does not enter into or qualify under a future RESS process, both Coillte Renewable Energy and Brookfield Renewables remain fully committed to facilitating an equivalent annual Community Benefit Fund.

The total fund per annum will depend on the final power output of a successful project.

How the fund will be used and administered?

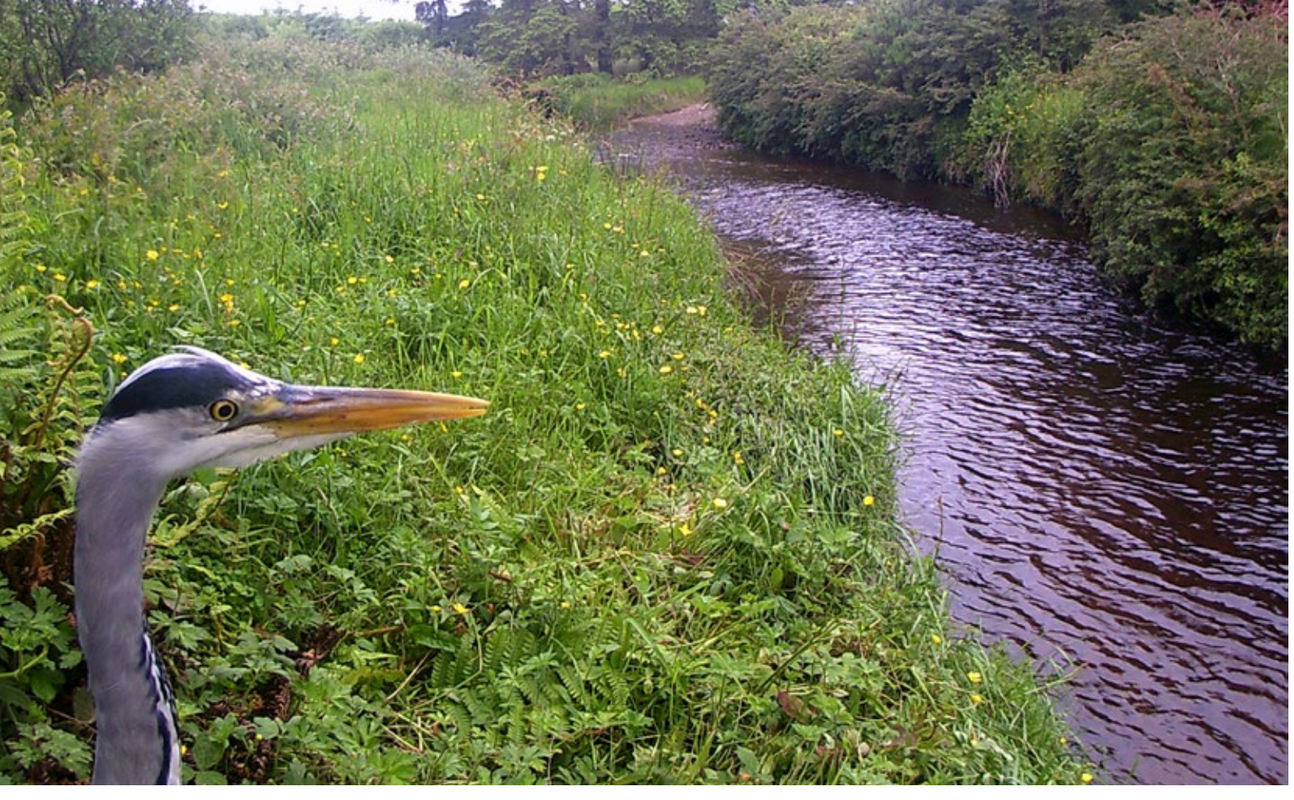
For any Community Benefit Fund to be truly successful, we believe that it should be governed and belong to the local community. The aim of any benefit fund is that it should be used to bring about significant, positive change in the local area. Working together with the near neighbours of the project, the focus will remain on achieving a set of key principles for inclusion in a future planning application. We believe that these principles should be detailed enough to give some clear boundaries and commitments at this stage. We also believe these principles should not restrict community flexibility and adaptability to changing circumstances in terms of the project evolution, government policy and direction. We understand that this will take much more community engagement over the coming year. With this in mind, we will continue to engage in many more meaningful conversations with local stakeholders on the possibility of exploring and developing a community benefit model that the local community are fully at the centre of.

8. ECOLOGY

Aquatic Ecology

The Study Area for the project is located almost entirely within the Lee, Cork Harbour and Youghal Bay catchment. A small northern section is contained within the Blackwater [Munster] catchment Special Area of Conservation (SAC), meaning there is a hydrological connection with the Blackwater River from the north of the Study Area. Consequently, an in-depth series of aquatic baseline surveys have been developed to examine aquatic species which may be using the streams and rivers which collect water from the Study Area. These include: freshwater pearl mussel, white-clawed crayfish, sea lamprey, brook lamprey, river lamprey, twaite shad, salmon and otter. The habitats, including Alluvial forests, in association with these rivers and streams will also be examined during the aquatic studies with findings included in the design.

A survey of each tributary in the catchment area of the Study Area is scheduled to be carried out during the summer of 2020 under a license to be issued by Inland Fisheries Ireland (IFI). Electro-fishing will also be conducted at the same locations providing a solid baseline covering the majority of the tributaries and sections of the main channel of the catchment to provide a robust fisheries baseline. All studies will be carried out in consultation with, and as advised by, Inland Fisheries Ireland.



Heron pictured by trail camera on Laney river during ecology surveys

BIODIVERSITY

As the project design progresses, a key element will be the development of suitable proposals for habitat, nature, wildlife and ecological conservation within, and possibly outside of, the Study Area. The word “biodiversity” is a scientific term, referring to all of the living creatures that form the web of life in which we live. In working terms, the conservation and enhancement of biodiversity refers to the conservation of wild species of plants and animals, and the habitats on which they depend. “Nature conservation” refers to proactive management, where the objective is to maintain, enhance or restore natural habitats and/or the species associated with them. Science is showing that wild species are disappearing at a significant rate, particularly in recent decades, and there are concerns that this is having growing impacts on our world. All sectors of society are increasingly being asked to engage positively with this issue and find ways to address the balance of nature. As the ongoing studies and assessments of the ecology and habitats within the projects Study Area evolve a better picture will become available of where nature conservation could have the greatest impact here. Our project ecologists will identify proposals which could be implemented in tandem with a successful future wind farm project.

Fox cub image captured by trail camera operating during the project ecology survey.

9. LANDSCAPE AND VISUAL

Macro Works, established in 1999, is a leading consultancy firm based in Dublin that specialises in visual impact analysis and visual impact graphics. Macro Works have been commissioned to undertake the Landscape and Visual Impact Assessment (LVIA) for the project and have completed preliminary desk studies and fieldwork to-date.

The view of the project from the surrounding landscape will be a key consideration as the project design progresses. A landscape and visual impact assessment will be carried out to understand the visual impact of the wind farm on the existing environment.

The desk studies completed by Macro Works to date include a detailed review of landscape and visual designations within the Cork County Development Plan, which include ‘High Sensitivity’ landscape zzonings and designated scenic routes, such as the Butter Road, in the project’s Study Area. The desk studies also include a review of recreational features within a 20 km radius of the Study Area, such as walking routes (including the Duhallow Way), cycling routes and popular tourism, heritage and amenity sites. Settlements, key transport routes and local dwelling clusters are also considered at this stage.

Having established important locations (receptors) from which the visual impact of the proposed development needs to be examined, a ‘Zone of Theoretical Visibility’ (ZTV) map is produced. The ZTV indicates from where in the landscape of the Study Area, views of the proposed wind farm may, or may not, be visible from based on natural occurring screening. Only locations with potential views of the proposed wind farm are relevant for further consideration in terms of the visual assessment.

Subsequent to the initial desk study phase, fieldwork was undertaken to gain an appreciation of the landscape character and key landscape elements within the Study Area and surrounds. Photography was captured at 19 key receptor locations, which represents around 60-70% of the total anticipated viewpoints likely to be used for a robust visual impact assessment. This initial modelling will be refined further at later design stages.

Using the photography captured from the initial set of these 19 viewpoints, ‘photomontages’ are then prepared to illustrate what the proposed wind turbines would look like from each viewpoint. These photomontages give the project team and the public an opportunity to comment on and refine the proposed wind turbine layout in order to minimise visual impacts insofar as possible. This might mean removing/moving turbines that are visible from particularly sensitive locations or adjusting the wind turbine layout to avoid visual clutter or disharmony from other locations.

At this point in time, Macro Works have reviewed Design Iteration One using the steps outlined above and have provided constraints and design optimisation comments to the design team for consideration at the next design stage. Revised Zone of Theoretical Visibility (ZTV) maps and photomontages will then be prepared and reviewed for that next design stage in an ongoing design optimisation process.

10. NEXT STEPS

Project Milestones

Summer 2017	General ecological studies began in the wider study area.
Winter 2017	Initial landowner discussions began in the area.
Summer 2019	Engagement begins with the local communty.
Autumn 2019	Local landowner discussions to finalise Study Area concluded.
Autumn 2019	Meteorological wind measuring mast scoping studies progress.
Winter 2019	Meteorological wind measuring mast erection.
Winter 2019	Environmental impact assessment project team appointed.
Winter 2019/20	Detailed environmental and engineering studies begin.
Summer 2020	Design Iteration 1.
Summer 2020	Grid route and turbine delivery route assessment progressed.
Summer 2020	Design Iteration 2.
Autumn 2020	Design Iteration 3.
Autumn 2020	Second meteorological wind measuring mast erection.
Autumn 2020	Planning application amalgamation and reviews.
Winter 2020	Planning application to be submitted to the Consenting Authority.

Ballyhoura and Castlepook Wind Farms on the Co. Cork / Co. Limerick border.

Musheramore Mountains as viewed from the Butter Road

We would encourage and welcome your input and comments on what you have read in this Newsletter. Please get in touch either by e-mail, post or by phone as follows:

Lo-call (Mon – Fri): 1890 928740

E-mail: ballinagreewindfarm@coillte.ie

Post: FAO John Lyons, Coillte Office, Hartnetts Cross, Macroom, Co. Cork. P12 XA50

Please visit the proposed Ballinagree Wind Farm project website at www.ballinagreewindfarm.ie for recorded presentations from some of the specialists working on the project, including the Ecologist, Aquatic Ecologist, Archaeologist and Landscape & Visual specialist. In the absence of being able to engage in face-to-face conversation at present, this content is being uploaded to further invite collaboration and feedback with local residents and interested stakeholders. Please check the "Latest News" section on the Ballinagree Wind Farm project website www.ballinagreewindfarm.ie to view this information.

Ballinagree
Wind farm

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