Natural Forces Renewable Energy 2 Ltd.

Proposed Cloonanny Wind Farm
Co. Longford

VOLUME II

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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CHAPTER 1
INTRODUCTION

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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1 Introduction

This Environmental Impact Assessment Report (EIAR) sets out the results of the environmental assessments which have been completed for the Proposed Development to inform the planning consent process.

The assessment has been completed as a statutory environment assessment. The environmental impact assessment process has been completed in line with Directive 2014/52/EU, based on the guidance presented in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

EIA is a process for anticipating the effects on the environment caused by a development. The document produced as a result is termed the EIAR. Article 1(2)(g) of the 2014 Directive (2014/52/EU) states that:

> *"Environment impact assessment" means a process consisting of:*
>
> *(i) The preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2).*
>
> *(ii) The carrying out of consultations as referred to in Article 6 and, where relevant, Article 7.*
>
> *(iii) The examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7.*
>
> *(iv) The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and*
>
> *(v) The integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a."*

The EIAR is a presentation of the potential environmental impacts of the Proposed Development with a focus on significant impacts.

Chapter 1 introduces the project and describes the scope and methodology of the EIA process. The consultation process undertaken is outlined and the competencies of the environmental assessment team are provided.

1.1 The Applicant

The Applicant, **Natural Forces Renewable Energy 2 Limited (Natural Forces),** is an independent energy producer with the in-house expertise to develop, build, own and operate wind, solar and hydro projects to deliver renewable energy projects in partnership with local communities, universities and sustainable energy communities.

Over the last 20 years Natural Forces has delivered over 100 renewable energy projects of various technologies across multiple jurisdictions in North America and Europe, which makes them one of the most experienced renewable energy developers in Canada and Ireland.

Natural Forces aims to develop renewable energy projects in partnership with local communities in line with the recent Renewable Energy Support Scheme (RESS) developed by the Department of Communications Climate Action and the Environment (DCCAE).

1.2 Relevant Guidelines

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022).
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).
- EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017).
- EU Environmental Impact Assessment of Projects: Guidance on Scoping (EU, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

1.3 Brief Project Description

A brief summary of the development is outlined below. A detailed description of the proposed development is contained within Chapter 2 of this EIAR and the Planning Statement that accompanies the application. The statutory notices should also be referred to.

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

The grid connection from the proposed on-site substation to the national electricity grid does not form part of the subject planning application. However, as part of the planning application process, this EIAR addresses three potential grid connection options currently considered to ensure a comprehensive environmental assessment of all aspects of the Proposed Development. The grid connection will be via 1 of the 3 potential options outlined below:

- Option 1 Connect the proposed development via (8.03km) to Richmond 110kV Substation
- Option 2 Connect the proposed development via (3.96km) to Longford 38kV Substation
- Option 3 Connect the proposed development via (5.85km) to Glebe 38kV Substation

It is anticipated that the grid connection from the Proposed Development will be by means of an underground cable connecting to one of the Substations identified above via the public road network. For bridge crossings, the cable will be located within the bridge deck, where there is insufficient depth and width available horizontal directional drilling (HDD) will be employed as an alternative.

Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

All elements of the proposed development as outlined above together with the turbine delivery route and grid connection options have been assessed as part of this EIAR.

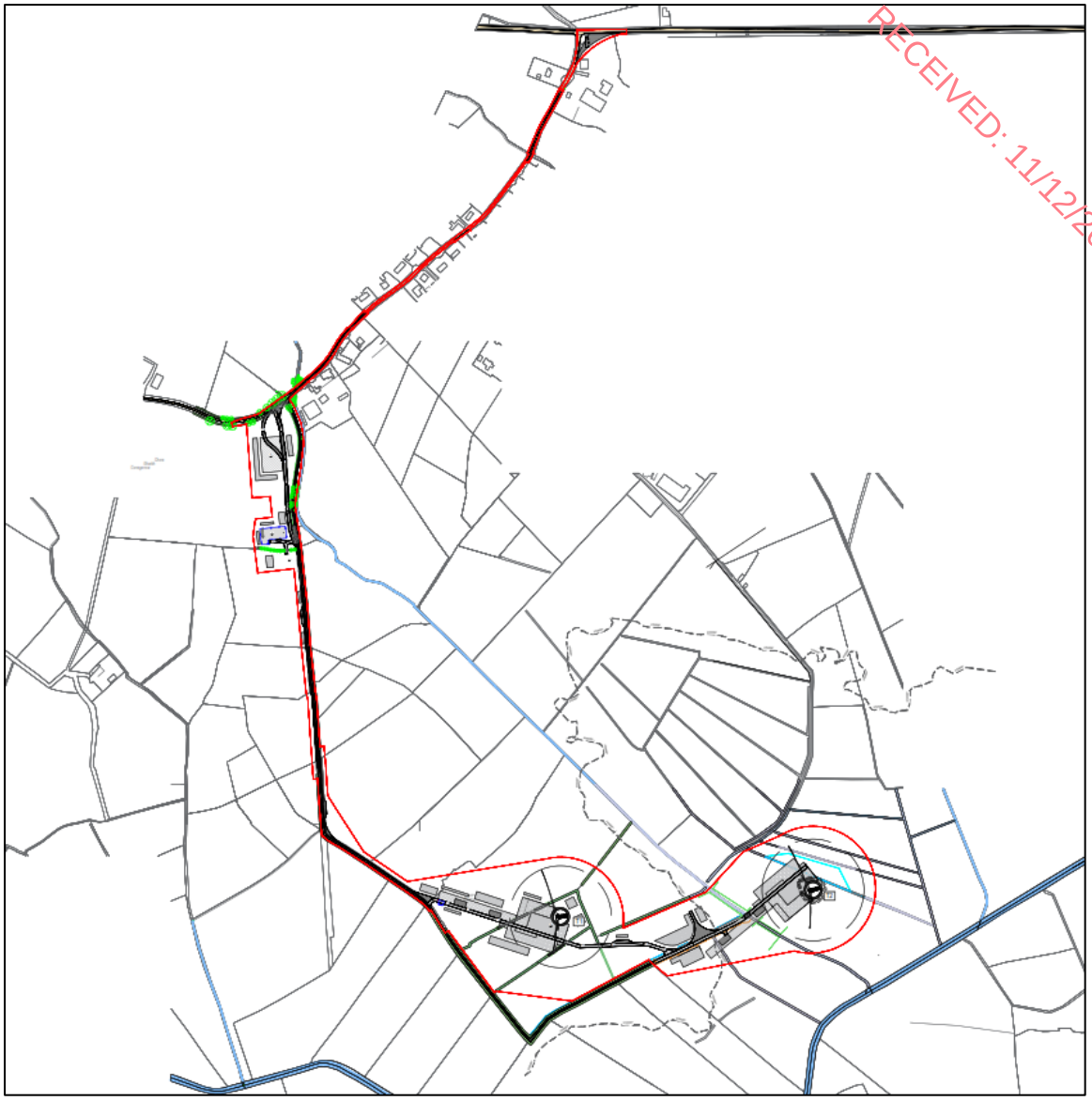

Figure 1.1 Site Layout (extract from Dwg. No. 22729-101)

1.4 Proposed Development Site

1.4.1 The Site

The application site (c.17.28 ha) is located in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow, and Gorteenorna Co. Longford, and is c. 2.8 km north-east of Longford Town and c.3.5 km south-east of Newtown Forbes.

The lands can be described as roughly L-shaped and are made up of a number of private landholdings.

The site comprises a private rural road and agricultural fields which are predominantly used for grazing. Access to the site is available from the Local Road L5046.

The site's low-lying landscape consists of a mixture of pastureland with higher ground to the north and east. The area is drained by several small ditches into the Camlin River to the south which flows in a general east-west direction to Lough Ree and ultimately to the Shannon further west.

See **Figure 1.2** for an aerial image of the site.

Figure 1.2 Aerial Image of Application Site (Source: Google Maps, Edited by MHP)

1.4.2 Surrounding Context

Similar to the subject site, the area surrounding the site is generally rural and mainly used for agriculture, with individual small clusters of dwellings and agricultural buildings along the L5046, L1011, R198 and R194.

The closest settlements to the site are the rural settlement clusters of Melview, located c. 700m northwest of the site and Carriglass, c. 900m southeast of the site. Furthermore, the site is located c. 2.8km north-east of Longford Town and c.3.5km south-east of Newtown Forbes.

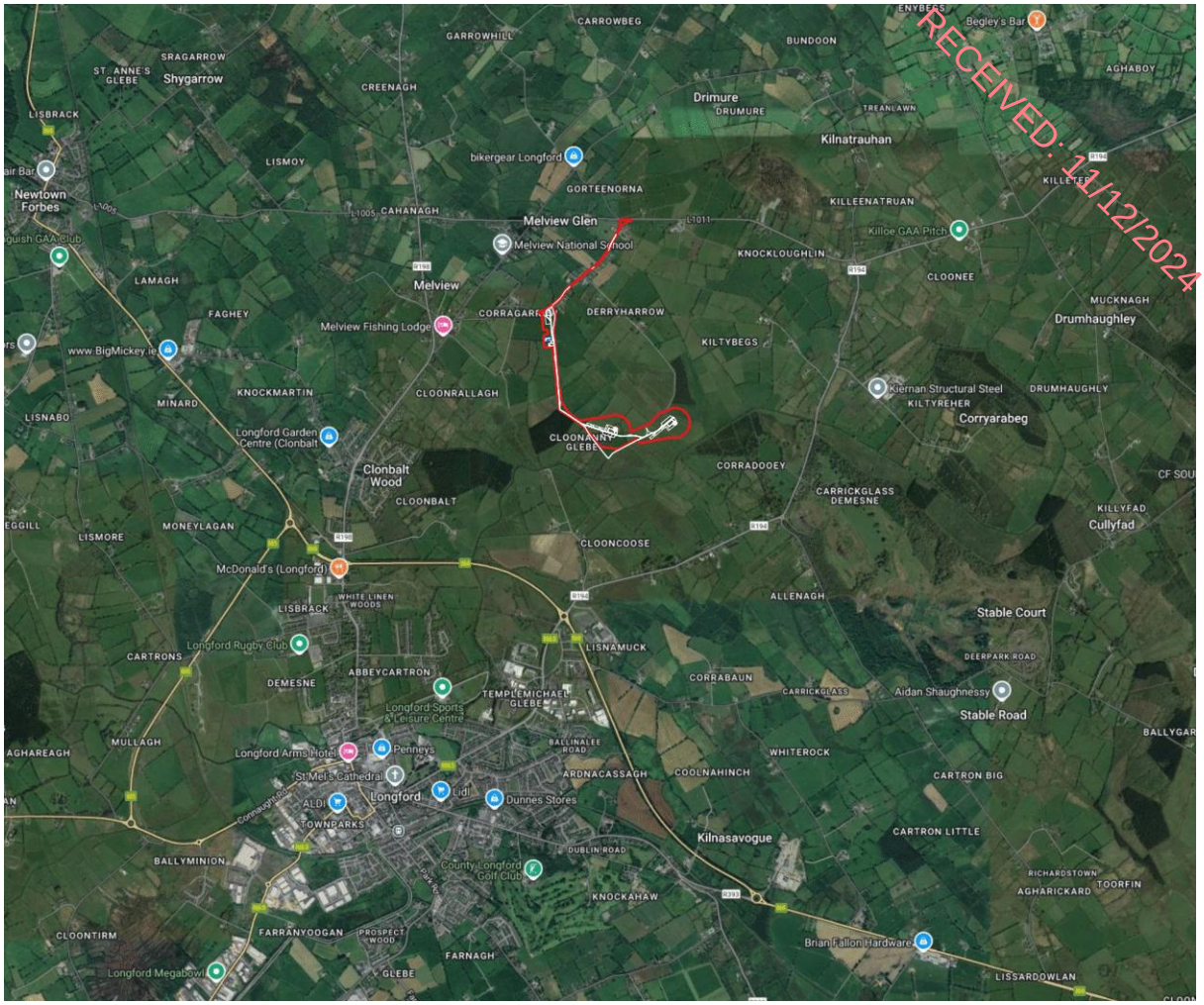

Figure 1.3 Aerial Image of the surrounding area (Source: Google Maps, Edited by MHP)

1.4.3 Land Use Zoning Objective

The subject site is located within the functional area of Longford County Council and is governed by the Longford County Development Plan 2021-2027 (LCDP).

The application site is categorized as 'Rural' (Open Countryside) in the LCDP. Under the Plan, there are no land use zoning objectives in place for the lands.

The Plan recognises that rural areas are an important resource within the County with significant potential to be harnessed for renewable energy projects, including wind, in both the narrative and associated policy objectives.

1.4.4 Study Area

In general, the study area or Zone of Influence is defined individually for each environmental topic, according to guidance and the geographic scope of the potential impacts or of the information required to assess those impacts. Details are provided by each discipline as part of the description of baseline conditions of the site.

1.5 Requirement for EIAR

Environmental Impact Assessment (EIA) requirements derive from EU Directives. Council Directive 2014/52/EU amended Directive 2011/92/EU and is transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Any proposed development which falls within one of the categories of development specified in Schedule 5 of the Planning and Development Regulations 2001, as amended, which equals or exceeds, a limit, quantity, or threshold prescribed for that class of development must be accompanied by an EIAR.

The Proposed Development falls under the category '*Energy Industry*' as set out in Class 3 (i) within Part 2 of Schedule 5, which provides that a mandatory EIA must be carried out for;

(i) *Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts.*

The Proposed Development will have a total output of 14MW, therefore an EIA is mandatory.

This EIAR has been prepared in accordance with the aforementioned legislative provisions and the following guidelines, among others, as specified in the various specialist EIAR chapters:

- Department of Housing, Planning and Local Government (DHPLG) (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- DHPLG (2017). Circular letter PL 1/2017 – Advice on Administrative Provisions in Advance of Transposition.
- European Commission (EC) (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
- EC (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on Scoping.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on the preparation of Environmental Impact Assessment Report.
- EPA (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

1.6 Purpose of Environmental Impact Assessment

The objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health. It does so by establishing minimum requirements for environmental impact assessments (EIA), , of public and private developments, before development consent being given, that are likely to have significant effects on the environment.

The 2014 Directive, for the first time, provides a definition of EIA and this is now defined by Section 171A of the Planning and Development Act, 2000 (as inserted by Regulation 16 of the 2018 Regulations).

It is defined as a process consisting of:

a) The preparation of an EIAR by the developer;

b) The carrying out of consultations with the public, prescribed bodies (and, where relevant, any affected Member States);

c) The examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through the consultation process;

d) The reasoned conclusion of the competent authority on the significant effects of the project on the environment; and

e) The integration of the competent authority's reasoned conclusion into any development consent decision.

The definition of EIA thus provides for a clear distinction between the environmental impact assessment process carried out by the competent authority and the preparation by the developer of an EIAR.

Section 2 of the 2000 Act has been amended within the Planning and Development (Amendment) Act, 2018 to define an EIAR as '*a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive*'.

1.7 Content of Environmental Impact Assessment Report

The EIAR entails a systematic analysis and assessment of the potential environmental effects of a proposed development on its receiving environment. Article 3(1) of the amended Directive prescribes a range of environmental topics that must be addressed in the EIAR, as follows:

> *"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors":*

a) A description of the likely significant effects of the project on the environment;

b) 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;

c) 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 options chosen, considering the effects of the project on the environment ;

d) A non-technical summary; and,

e) Any additional information specified in Annex IV of the Directive/Schedule 6 to the 2001 Regulations, as amended, relevant to the specific characteristics of the project and to the environmental features likely to be affected.

As is required by Annex IV of the 2014 Directive, this EIAR addresses matters including proposed demolition works, risks to human health, major accidents/disasters, biodiversity, climate change and cumulative effects with other existing and/or approved projects.

1.8 Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters The consultant firms and lead authors are listed in **Table 1.1**. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

Various environmental specialists were commissioned to complete the specialist chapters of the EIAR, as required by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment:

> *"Experts involved in the preparation of [EIARs] should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality".*

1.8.1 Author Information and Competency

This chapter was prepared by Anika Haget of McCutcheon Halley Chartered Planning Consultants. Anika holds a BEng in Geoinformation and Municipal Engineering from Frankfurt University of Applied Sciences, a MSc in Urban Planning from HafenCity University Hamburg and has over 5 years of professional experience as a planning consultant in Germany and Ireland. She is a Graduate Member of the IPI and has contributed to EIA Reports and Screening for infrastructure, residential and commercial projects.

1.9 Format and Structure of the EIAR

This EIAR is prepared according to the 'Grouped Format Structure' as described in the Guidelines on information to be contained in Environmental Impact Statements (EPA, 2022). This means that each topic is considered as a separate section. The advantages of using this format are that it is easy to investigate a single topic and it facilitates easy cross-reference to specialist studies.

The EIAR is sub divided into 3 no. volumes as follows:

- **Volume I** Non-Technical Summary;
- **Volume II** Environmental Impact Assessment Report; and
- **Volume III** Appendices to Environmental Impact Assessment Report.

Volume II is presented as 16 chapters as outlined in **Table 1.1**.

Table 1.1 EIAR Chapters and Contributors

Chapter	Aspect	Consultant	Lead Author
1	Introduction	McCutcheon Halley Planning Consultants	Anika Haget
2	Development Description	McCutcheon Halley Planning Consultants	Anika Haget
3	Alternatives	McCutcheon Halley Planning Consultants	Anika Haget
4	Population & Human Health	McCutcheon Halley Planning Consultants	Anika Haget
5	Landscape & Visual Impact Assessment	Macro Works Ltd	Jorden Derecourt
6	Material Assets -Transportation	Stephen Reid Consulting	Stephen Reid
7	Material Assets - Built Services	Mable Consulting Engineers Ltd	Barry McGinn
8	Land and Soils	Whiteford Geoservices Ltd	John Whiteford
9	Water and Hydrology	IE Consulting Engineers	Joanna Mackey
10	Biodiversity	ID Environmental Consultants	Ian Douglas
11	Ornithology	ID Environmental Consultants	Ian Douglas
12	Noise & Vibration	AWN Consulting Ltd	Mike Simms
13	Air Quality	AWN Consulting Ltd	Aisling Cashell
14	Climate	AWN Consulting Ltd	Aisling Cashell
15	Cultural Heritage	Icon Archaeology Ltd	John Kavanagh
16	Interactions of the Foregoing	McCutcheon Halley Planning	Anika Haget
17	Summary of Mitigation Measures	McCutcheon Halley Planning	Anika Haget

In addition, contributors have had regard to other relevant discipline-specific guidelines, these are noted in individual chapters of the EIAR.

A Glossary of Terms and Acronyms of relevance to the Proposed Development and commonly used throughout the planning and EIAR documents is included in **Appendix 1.1**.

1.10 Scoping

The purpose of scoping is to identify the information to be contained in an EIAR and the methodology to be used in gathering and assessing that information. The scope of this EIAR is informed by the requirements of the Directive 2014/52/EU and the transposing Regulations together with the Guidelines set out above. Applicants are not required to seek a formal scoping opinion.

The scope of individual assessments is informed by discipline specific guidelines and, where this is the case, they are referenced in each chapter.

Scoping requires the consideration of the nature and likely scale of the potential environmental impacts likely to arise from a proposed development or project. It is an iterative process that is ongoing throughout the development of the EIAR. The following topics, which include those stipulated in the amended Directive, have been scoped in for this assessment.

- Population and human health
- Landscape and visual
- Traffic and transportation
- Built Services: Material Assets
- Land & Soils
- Water & Hydrology
- Biodiversity
- Ornithology
- Noise and vibration
- Air Quality
- Climate
- Cultural heritage, archaeology and built heritage;
- Interactions between the above-listed topics.

1.11 Scope of Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into Directive 2011/92/EU. Annex IV of the EIA Directive is to be read in conjunction with article 5(1) and sets out the information to be included in an EIAR. Annex IV was transposed into national law via article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the "2018 Regulations") which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended.

The Directive requires that the EIAR describes the cumulation of effects with other existing and/or approved projects.

Cumulative effects may arise from:

> *"- The interaction between the various impacts within a single project;*
>
> *- The interaction between all the differing existing and / or approved projects in the same areas as the proposed project."* [1]

[1] Department of Housing, Planning and Local Government, "Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment" (August 2018), page 40.

In August 2018, the Department of Housing, Planning and Local Government issued *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*. The Guidelines summarise "cumulative effects" in the following way at page 40;

> *"Effects are not to be considered in isolation but cumulatively i.e., when they are added to other effects. A single effect on its own may not be significant in terms of impact on the environment but, when considered together with other effects, may have a significant impact on the environment. Also, a single effect which may, on its own, have a significant effect, may have a reduced and insignificant impact when combined with other effects.*

Paragraph 2(e)(i)(V) of Schedule 6 (paragraph 5(e) of Annex IV) provides as follows;

> *"the cumulation of effects with other* ***existing or approved developments, or both****, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources." (emphasis added).*

Accordingly, each chapter of this EIAR assesses the cumulative effect of permitted development in combination with the proposed development. A list of the projects considered is included in **Appendix 1.2**.

Individually, each specialist consultant has reviewed developments that are under construction, permitted, and/or under consideration in the local area, and using their expertise they have identified projects relevant to their discipline that may interact to produce a cumulative effect. The detail of the identified projects and plans is set out within each specialist chapter of this EIAR.

While the Directive does not require a cumulative assessment of future proposals without a lodged planning application, the broad scope and purpose of the EIA Directive is acknowledged. In light of this, consideration is given to the judgement of *Fitzpatrick v An Bord Pleanála* [2019] IESC 23, henceforth referred to as the 'Apple Case'.

The Supreme Court in the Apple Case held that:

1) An EIA must contain an assessment of the cumulative effects of future developments that form an "integral part" of the development applied for (i.e., where there is a "functional or legal interdependence" between the development applied for and the envisaged future development).

The analysis of the Supreme Court in *An Taisce (Kilkenny Cheese)*[2] is also relevant in this respect. In *Kilkenny Cheese* the case being made was that the Board had failed to assess the effects of milk production (for the cheese factory) on climate, or on water catchments adjoining the farms from which the milk would be supplied. It was argued that these were the indirect effects of the proposed factory, arising from offsite activities which were closely functionally and operationally connected to the proposed cheese factory.

[2] *An Taisce – The National Trust of Ireland v An Bord Pleanála* [2022] IESC 8 ('Kilkenny Cheese')

The Court analysed a suite of case law dealing with the issue of functionally interdependent projects or elements of a project that should be the subject of the EIA process, and other cases where the effects of other 'offsite' activities were deemed to be too remote and not the effects of the project for which consent was sought.

- The Court considered that an off-site construction assembly site would be subject to the EIA for the proposed development which the construction assembly site would serve[3]. A construction assembly site for an offshore wind farm project, for example, should be assessed as part of the EIAR for the offshore wind farm.
- The Court noted that in *O'Grianna*[4], the connection of the wind farm to the grid was considered so fundamental to the purpose of developing and operating a wind farm that it could not be omitted from the EIA of the project.
- In the *Apple* case[5], the Court was satisfied that the first data centre hall and its grid connection were closely interrelated and should be assessed within the EIA process, but that subsequent phases of development only had to be assessed to the extent reasonably practicable, because the first phase and grid connection could be developed and operated on an independent and stand-alone basis. Significantly, any subsequent phases of development would also be subject to EIA and cumulative impact assessment before proceeding.
- In *Kemper*[6] the Court was satisfied that the EIA of a wastewater treatment plant did not have to include the ultimate application of the waste biosolids to as yet unidentified lands as fertilizer. The use of biosolids for that purpose would depend on landowners coming forward to 'purchase' the fertiliser for use on their lands. That did not form part of the development for which consent was sought and was too remote to be assessed within the EIA process, save in the most general terms.
- In UK cases *Finch*[7] and *Greenpeace*[8] the Courts considered that the obligation to assess a project requires the EIA to assess the direct and indirect effects *of the project for which consent is sought*, including its operation, and not some other project for which consent is not sought. Indirect effects are less immediate than direct effects, but they are nevertheless the effects *of the project.*

This line of case law strongly establishes that the obligation to carry out EIA depends on whether the project or development for which consent is sought is a Class of project to which the Directive applies, and if so, the scope of that EIA process is linked to the development for which consent is sought (the O&M facilities, pontoon, works to Berth and the carpark), and not to some other project for which consent is not sought (the offshore wind farms).

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[3] See paragraph 81 of the *Kilkenny Cheese* judgment.

[4] *O'Grianna v An Bord Pleanála* [2020] IEHC 601

[5] See *Fitzpatrick and Daly v An Bord Pleanála and Apple Distribution International*, [2019] IESC 23, [2019] 3 IR 617

[6] *Kemper v An Bord Pleanála* [2020] IEHC 601

[7] *R (Finch) v. Surrey County Council* [2020] EWHC 3566 (Admin)

[8] *Greenpeace Limited v. The Advocate General* [2021] CSIH 53

Cumulative effects are not limited to projects, and it is necessary to also consider relevant Plans. According to the Environment Protection Agency (2020), in Ireland, key cumulative effects – where environmental receptors are at, or near, their thresholds or their capacity to assimilate more change – include climate change; water quality, flood risk, air quality, biodiversity and landscape. For the purpose of this EIAR, the following have been considered in relation to cumulative impacts:

- **Longford County Development Plan 2021-2027** - gives spatial expression to the economic, social, housing and cultural development of the County. The Plan has a key role in protecting the environment, heritage, and amenities of the county and in mitigating against the impacts of climate change. It includes policies and objectives for all of the aspects included in this EIAR. Accordingly, this EIAR provides a narrative on the cumulative effect of the Proposed Development together with the Development Plan policies and objectives.
- **The Climate Action Plan, 2024** - climate change is the ultimate cumulative effect, nationally and internationally. Thresholds for greenhouse gas (GHG) emissions are being exceeded. Ireland is committed to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. Following on from Climate Action Plans 2019, 2021 and 2023, Climate Action Plan (CAP) 2024 sets out the roadmap to deliver on this climate ambition. One of the key measures of the CAP is to accelerate and increase the deployment of renewable energy to replace fossil fuels to reach the target of 80% of electricity demand from renewable energy by 2030. Therefore, the CAP sets a target of at least 9 GW of onshore wind by 2030. The cumulative effects of this Plan together with the Proposed Development are considered in the following chapters; Population & Human Health, Material Assets: Traffic & Transport, and Climate.
- **National Biodiversity Plan** - The Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity'. It has been developed in line with the EU and International Biodiversity strategies and policies. The cumulative effects of this Plan together with the Proposed Development is considered in the Biodiversity chapter.
- **Standards in the EU Air Quality Directive and 'daughter' directives** - establish the levels of air pollutants that have no significant impacts on human health or the environment. The cumulative effects of the Directive together with the Proposed Development is considered in the Population & Human Health Chapter and the Air Quality Chapter.

In addition, each of the specialist chapters (4 - 15) considers the cumulative effects of projects and plans relevant to the zone of influence and discipline specific factors.

1.12 Impact Assessment Methodology

Each chapter of this EIAR assesses the direct, indirect, cumulative, and residual impact of the Proposed Development for both the construction and operational stage of the Proposed Development.

The impact assessment methodology is detailed in the respect of the various environmental topics in the respective chapters herein. The assessment of impacts is based on the source-pathway-receptor model, which dictates that, for an environmental impact to occur, there must be a source, a receptor which is sensitive to the effect in question, and a pathway by which the effect can reach the receptor. Unless otherwise stated, the criteria for effect / impact characterisation are as per the EPA guidelines

(as set out in **Table 1.2**). The significance of an impact is determined through comparison of the character of the predicted effect to the sensitivity of the environment / receptor in question.

Table 1.2 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of and ecosystem, or by removing nuisances or improving amenities.
Neutral	No effects of effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effect	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.
Duration of Effects	
Momentary	Seconds to minutes
Brief	Less than 1 day
Temporary	Less than 1 year
Short-term	1-7 years
Medium-term	7-15 years
Long-term	15-60 years
Permanent	Over 60 years
Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.

Quality of Effect	
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of Effects	
Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing	The environment as it would be in the future should the subject project not be carried out.
Worst Case	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

1.13 Consultation

Prior to lodging this application, the required information has been issued to the Department of Housing, Planning and Local Government's EIA Portal. The purpose of this tool is to inform the public, in a timely manner, of applications that are accompanied by an EIAR.

Pre-planning consultation between representatives of the applicant and Longford County Council was undertaken on 25th April 2024. The following is relevant to the environmental assessment in this EIAR:

- Effects on Built Heritage, consideration of visual impacts on protected views.
- Landscape and visual, representative sample of viewpoints and inclusion of additional views from Abbeyshrule, Derryharrow Road and Melview Road.
- Flood Risk and potential effects of displacement, if any.
- Biodiversity, hedgerow removal to facilitate proposed road widening and access arrangements.

The applicant hosted a community information meeting on 9th October 2024. The outcome is detailed in a Community Consultation Report which is included in **Appendix 1.3**.

Further details on these consultation events are included in the Planning Statement by McCutcheon Halley Chartered Planning Consultants, submitted with this application.

CHAPTER 2
DEVELOPMENT DESCRIPTION

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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2 Description of the Proposed Development

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) considers the location of the proposed development together with its main physical characteristics, including design, size, scale and land-use requirements of all relevant phases of the existence of the project from its construction through to operation and decommissioning the proposed development to be located in the townlands of Gorteenorna, Derryharrow, Corragarrow, Cloonanny Glebe, Co. Longford.

The proposed development described in this chapter was arrived at following the consideration of various reasonable alternatives as described in chapter 3 Alternatives which accompanies this EIAR.

The purpose of this chapter is to provide a description of the project in sufficient detail, which, when taken together with the descriptions of the existing (baseline) environment provided in each chapter of this EIAR, will allow an independent reader to understand the likely significant environmental effects.

The contents of this chapter have been informed by the Design Team, and it should be read in conjunction with the drawings and supporting reports submitted.

2.2 Development Location & Site Context

The proposed development site is located c. 2.8 km north-north-east of Longford Town and 3.5 km east-south-east of Newtown Forbes. Refer to Figure 2.1 Regional Context of the site. The site's low-lying landscape ranging in elevation from 40m AOD to c.50m AOD, with T1 located slightly higher than T2 Refer to Figure 2.2 Site Topography. The redline boundary of the proposed development has a total combined area of 17.28 ha (area outlined in red in Figure 2.3) can be described as roughly L-shaped and is accessed at the north of the site via the junction at the road L1011 and L5046.

The site is located within the functional area of Longford County Council and is governed by the Longford County Development Plan 2021-2027 (LCDP). The application site is categorised as 'Rural' (Open Countryside) in the LCDP. Under the Plan, there are no land use zoning objectives in place for the lands on with the development is located. However, the plan recognises that rural areas are an important resource within the County with significant potential to be harnessed for renewable energy projects, including wind, in both the narrative and associated policy objectives.

The lands within site comprise of a number of private landholdings, a private rural road and the land use is predominantly agricultural pasture and grassland with higher ground to the north and east.

There are no residential dwellings within the site. The settlement pattern in the vicinity of the is principally composed of isolated rural dwellings and farmsteads and small rural clusters of development. The closest settlements to the proposed development are the rural settlement clusters of Melview, located c. 700m northwest of the site and Carriglass, c. 900m southeast of the site. Furthermore, the site is located c. 2.8km north-east of Longford Town and c.3.5km south-east of Newtown Forbes.

The area is drained by several small ditches into the Camlin River to the south which flows in a general east-west direction to Lough Ree and ultimately to the Shannon further west.

Two surface water features: the unnamed stream (EPA Code: IE_SH_26C010800) and the Derryharrow stream, both of which drain into the Camlin 26 stream located to the south of the site. The unnamed stream flows along the eastern boundary of the site, south of the road L5046, and extends to the southeastern area near the proposed turbine T2 while the Derryharrow Stream does not pertain the application site but flows to the east.

The development has been designed to avoid sensitive habitats, particularly watercourses, areas of high-quality wet grassland and hedgerows. The vast majority of the turbine hardstands, access routes, and associated infrastructure are located on existing roadways and improved grassland.

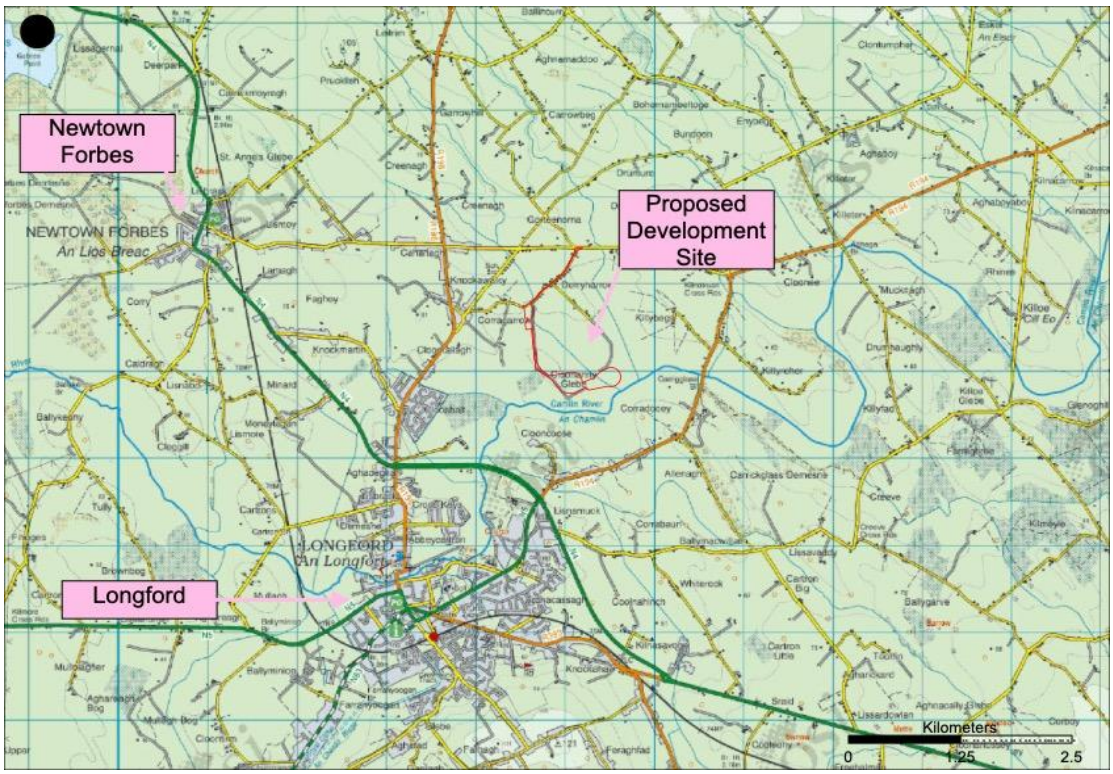

Figure 2.1 Proposed site on a Regional Context (OSI, 2024)

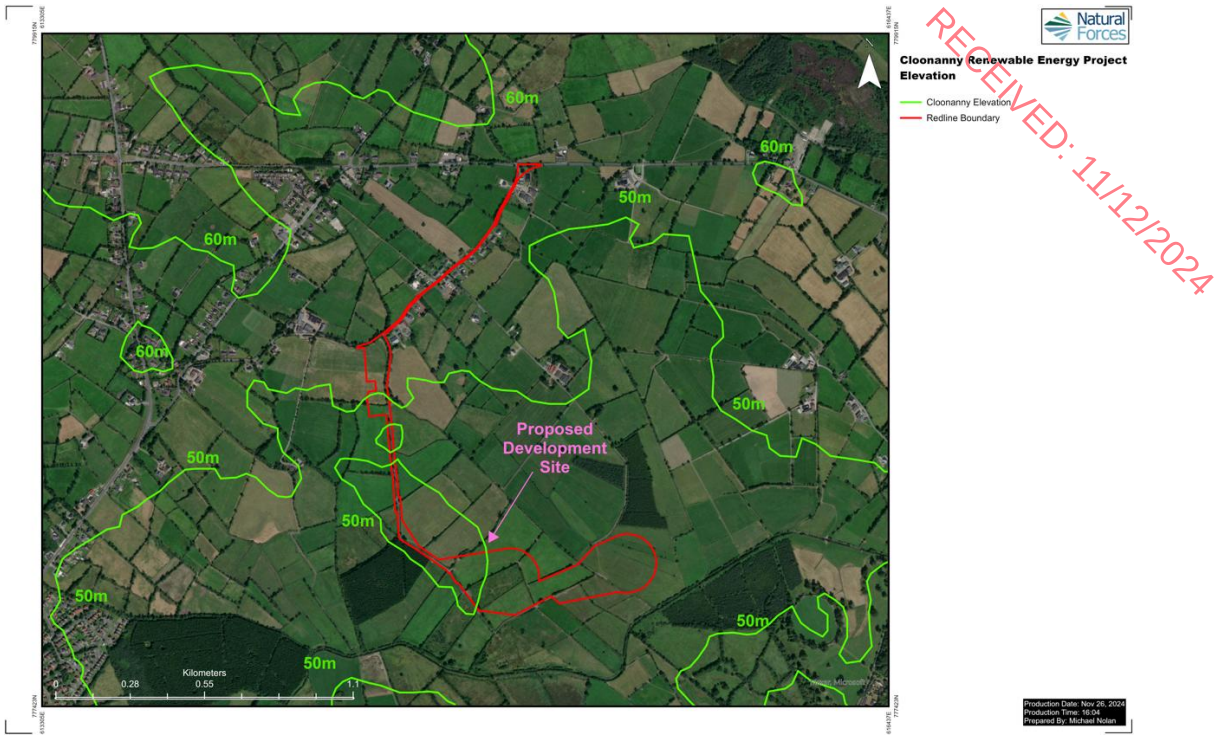

Figure 2.2 Site Topography

2.3 Proposed Development

2.3.1 Statutory Development Description

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

2.3.2 Development Overview

The proposed development will be located in the townlands of Gorteenorna, Derryharrow, Corragarrow, Cloonanny Glebe, Co. Longford and will involve the construction and operation of two Enercon E175 EP5 E2 Wind Energy Converters, each with an electrical rating of 7 MW. These turbines will have a rotor diameter of 175 metres, a hub height of 112.4 metres, and a blade tip height of 199.9 metres. Additionally, the development will include a 20 kV substation compound, comprising two prefabricated modular substation buildings, battery storage containers, met mast and all ancillary and associated works, including underground cabling to connect to the national grid. See Figure 2.3 Proposed Development Layout Table 2.1 Turbine Coordinates and Table 2.2 which outline the key parameters of this proposed development.

Turbine ID	ITM Coordinates		
	Easting:	Northing:	Existing Elevation
Turbine 1 (T1)	615036	777906	49m
Turbine 2 (T2)	615470	777952	44m

Table 2.1 Turbine Coordinates

Figure 2.3 Proposed Development Layout

Development Overview	
Site Area	17.28ha
Turbine Model	Enercon E175 EP5 E2
Rated Power	7MW
No Turbines	2
Hub Height	112,4m
Tip Height	199.9m
Rotor Diameter	175m
Blade Length	86m
Permanent Met Mast	32m
On Site Substation	20kV
Battery Energy Storage System	2 – 4 hour storage
New Roads	1 no permanent, c. 800m; 1 no temporary, c110m
Temporary Upgrade/Widening	c. 1.45km

Table 2.2 Development Overview

The layout of the proposed development has been designed to minimise the potential impact on the environment while maximising the energy yield from the wind resources. The proposed development has been designed and sited to adhere to the current 2006 Wind Energy Development Guidelines which remain in force. Therefore, no residential property is located within 500m of the closest proposed turbine. During the design development, due regard has also been had to the Draft Revised Wind Energy Development Guidelines 2019. Although not yet adopted, the Draft Revised Guidelines provide useful guidance for the siting and assessment of wind turbines. The location of the proposed turbines in relation to the nearest residential Eircode is 803.43m from 800.32m from T2 i.e. greater than 4 times tip height. The proposed development also includes for an onsite 20kV electricity substation and battery energy storage system and underground grid connection cabling, connecting the onsite substation to the national electricity grid via 1 of 3 preferred grid connection routes as outlined below and further described in Section 2.2.3 and within the CEMP which accompanies this application as a standalone document.

1. Option 1 Connect via (8.03km) to Richmond 110kV Substation
2. Option 2 Connect via (3.96km) to Longford 38kV Substation
3. Option 3 Connect via (5.85km) to Glebe 38kV Substation

The underground grid connection cabling will be located within the public road corridor or existing tracks for its entire length. To ensure clarity, the selected Grid Connection Route will be the subject of a separate future application to Longford County Council

All elements of the proposed development including potential grid connection routes and the turbine delivery route have been fully assessed as part of this EIAR.

The operational lifespan of the project is proposed to be 35-years following its full commissioning. Any further operation beyond 35-years would be subject to a further planning permission and EIA. This EIAR therefore assumes that full decommissioning will take place 35-years after commissioning.

2.3.2.1 Wind Turbine

The selected wind turbine model is the Enercon E-175 EP5 E2 with a maximum tip height of 199.9m. See Figure 2.4 below and the Elevation Drawing No. 22729-200 and 22729-202 prepared by Mable Consulting Engineers which provide details of the wind turbine dimensions, specification documents from the turbine manufacturer ENERCON are also presented in Appendix 2.1 to this EIAR and provide further detail in relation to the key components of the wind turbines.

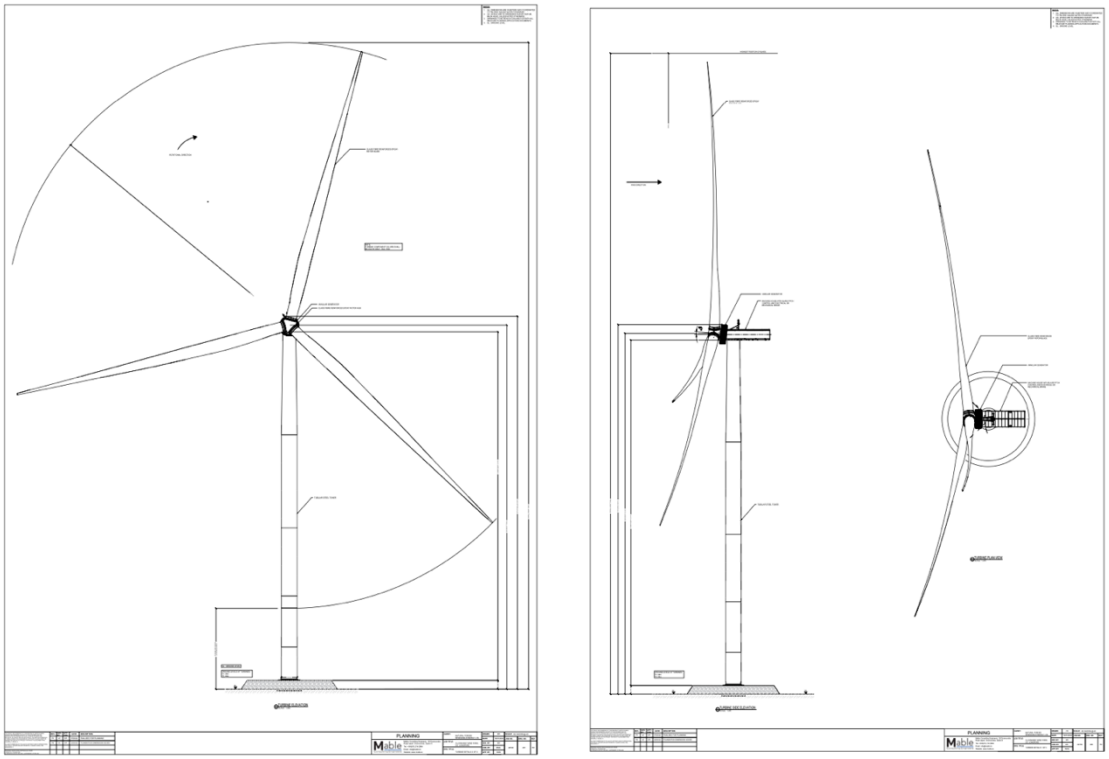

Figure 2.4 ENERCON E-175 EP5 E2 wind energy converter Elevation Drawings

The ENERCON E-175 EP5 E2 has an electrical rating of 7MW and therefore, the combined generating capacity of the 2 no turbines will be 14MW.

The rotor blade diameter is 175m, each of the 3 blades comprises a length of 86m. The blades are made of GFRP (glass-fibre reinforced plastic), CFRP (carbon-fibre reinforced plastic), balsa wood and foam. The rotor blades are connected to the central rotor hub which is connected to the nacelle.

The nacelle sits at the top the tower and contains the key mechanical components of the wind turbine including the gearbox, shafts, generator, control unit, and brake. A yaw mechanism is employed to allow the entire nacelle to be rotated so that the rotor is always optimally aligned with the wind. A wind vane located on the nacelle of the turbine controls the yaw mechanism. A control unit is typically located at the base of the turbine and an internal lift or ladder leads up to the nacelle where the shaft, generator and gearbox are located. The nacelle is approximately 5m in width and 20m in length and also accommodates aviation lighting to Irish Aviation Authority (IAA) specifications.

The turbine tower is a conical steel tube with multiple layer paint finish. The towers comprise a steel ring at the base which is assembled on top of the concrete foundations. The base of the tower is

approximately 5m in diameter, tapering to approximately 4m where it is attached to the nacelle, measuring 107.7m in height. The total hub height including foundation measures 112,4m, the height from ground to the top of the nacelle measures 115,1m. The tower is accessed by a galvanised steel hatch door, which will be kept locked except during maintenance.

The turbines are multi-ply coated to protect against corrosion. It is proposed that the turbines will be painted and coated (Ral 7038 agate grey) with weather and corrosion protection which means that no work is required in this regard once the turbine is installed. In total, 26 components are required for the construction of 2 no Enercon E-175 EP5 E2, as listed in Table 2.3 below and the key components are identified on figure 2.5.

All components will be delivered to site via 14 no abnormal load deliveries. All abnormal load deliveries will have an axel configuration to ensure they are within standard axel load limits as per S.I. No. 5/2003 - Road Traffic (Construction and Use of Vehicles) Regulations 2003.

Turbine Component	Dimensions (m)	No per Turbine	Total Number	Weight (ton)
Generator Half Section: 12h	10.38 x 4.99 x 2.6	1	2	71
Generator Half Section: 6h	10.38 x 4.99 x 2.3	1	2	71
Main Bearing Unit	4 x 3.66 x 2.86	1	2	30
Nacelle	14.25 x 4.99 x 3.44	1	2	76,8
Rotor Hub	4.9 x 4.55 x 3.95	1	2	51,6
Rotor Blade	85.9 x 4.09 x3.88	3	6	31,8
Tower Section 1	32 x 4.9 x 5.05	1	2	70,4
Tower Section 2	28.75 x 4.9 x 5.05	1	2	78,3
Tower Section 3	21.07 x 4.91 x 5.06	1	2	76,9
Tower Section 4	15.35 x 4.92 x 5.07	1	2	77,5
Tower Section 5	10.11 x 4.95 x 5.10	1	2	89,4

Table 2.3 Turbine Component Details

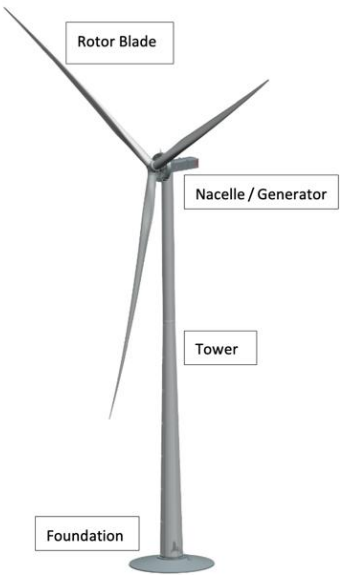

Figure 2.5 ENERCON E-175 EP5 E2 wind energy converter (Source: ENERCON GmbH)

2.3.2.2 Rotor Blades

The rotor blades are made of GFRP, CFRP, balsa wood and foam and are a major factor in the wind energy converter yield and sound emissions. The shape and profile of the rotor blades were designed with the following criteria in mind:

- High power coefficient
- Long service life
- Low sound emissions
- Low mechanical loads
- Efficient use of material

The rotor blades of the wind energy converter were specially designed to operate with variable pitch control and at variable speeds. A polyurethane-based surface coating protects the rotor blades from environmental influences such as UV radiation and erosion. This coating is visco-hard and highly resistant to abrasion. Microprocessor-controlled pitch units adjust each of the 3 rotor blades independently of each other. 2 blade angle measurements constantly monitor the set angle of each blade, and the 3 blade angles are adjusted individually. This enables quick and precise setting of the blade angles according to the prevailing wind conditions.

2.3.2.3 Nacelle

The hub rotates around the fixed axle pin on 2 rotor bearings. Among other components, the rotor blades and the generator rotor are attached to the hub. The slip ring unit is located at the tip of the axle pin. It transmits electrical energy and data between the stationary and rotating parts of the nacelle via sliding contacts. The stator support is the load-bearing element of the fixed generator stator. The stator support is firmly connected to the main carrier. The stator supports the electrical windings in which the electric current is induced. The main carrier is the central load-bearing element of the nacelle. All parts of the rotor and generator are attached to it either directly or indirectly. The main carrier rotates on the tower head by means of the yaw bearing. The entire nacelle can be rotated by the yaw drives so that the rotor is always optimally aligned with the wind. The machine house casing comprises multiple sections and is fastened to the nacelle floor by means of steel profiles.

2.3.2.4 Generator

A permanently excited synchronous generator of internal rotor design is used in the wind energy converter. The wind energy converter operates at variable speeds in order to optimally exploit the wind energy potential at all wind speeds. The annular generator therefore produces alternating current with fluctuating voltage, frequency and amplitude. The windings in the stator of the generator form several independent three-phase systems. These systems are actively rectified in the nacelle. The inverters then reconvert them into three-phase current whose voltage, frequency and phase position conform to the grid. The transformer in the nacelle converts the voltage generated to the level of the grid into which the current is fed. The transformer is connected to the receiving grid via the medium-voltage switchgear. Consequently, the generator is not directly connected to the receiving grid of the utility and is decoupled from the grid by the full-scale converter.

2.3.2.5 Tower

The tower of the wind energy converter will be either a tubular steel tower, hybrid steel tower or otherwise known as a hybrid tower.

The tubular steel tower is a sheet steel tube consisting of a small number of large steel sections. Depending on the tower version, the lowermost steel section may be in one piece or subdivided into several longitudinal elements. The longitudinal elements are first joined at the installation site to form a single steel section. Flanges with drill holes for assembly are welded onto the ends of the steel sections. The steel sections are stacked on top of one another and bolted together at the installation site. They are linked to the foundation by means of a foundation basket.

The hybrid steel tower is a sheet steel tube consisting of a small number of large steel sections. The lower steel sections are subdivided into a number of edged section plates. The upper steel sections are in one piece. The edged section plates are first bolted together to form steel sections at the installation site. The individual steel sections are stacked on top of each other and bolted together at the installation site. This is done for the longitudinally divided steel sections by connection plates and for the one-piece steel sections by flange joints. They are linked to the foundation by means of a foundation basket. The lower part of the hybrid tower is made of concrete segments and the upper part of steel sections. The concrete segments are assembled from precast elements that are stacked on top of each other at the installation site. The upper steel sections are placed onto the concrete segments and bolted in place. The concrete segments are prestressed vertically by means of prestressing steel tendons. The prestressing tendons run either vertically through ducts in the concrete segments or externally along the interior tower wall. They are anchored to the tower foundation.

All towers receive the final paint topcoat or weather and corrosion protection at the factory. This means that ideally no further work is required on the tower surface after installation.

2.3.2.6 Turbine Foundations

Each turbine tower is secured to a steel ring foundation which can comprise either a reinforced concrete (gravity) foundation or a piled foundation. The precise type of foundation to be used for each turbine will depend upon the specific ground conditions at each location. This shall be established through detailed technical design and post-consent geotechnical investigations prior to construction, as is standard best-practice in all construction projects. Initial geotechnical investigations carried out to date at each of the turbine locations demonstrate that the subsoil conditions are suitable for the construction of standard turbine gravity foundations (see Chapter 8); however, this will be confirmed during further post-consent investigations. Again, it is established EIA practice that such technical details may be left over for agreement post consent, on the provision that the results to be achieved by any mitigation measures are specified and the project cannot proceed unless those results are fully achieved (*People Over Wind & anor -v- An Bord Pleanála [2015] IEHC 271*).Details of the construction principles to be implemented in the construction of either gravity based or piled foundations are include in Section 5.7.10.2 of the CEMP which accompanies this planning application The foundations will be of circular shape on plan with an anticipated diameter of approximately 26m and total height of 2.65m will require approximately 650m^3 of poured concrete and 110 tonnes of steel reinforcement. Once the concrete has been poured for the foundations, the

area surrounding the foundation will be backfilled with granular material. Drawing No. 22729-202 prepared by Mable Consulting Engineers shows the proposed turbine foundation details.

Figure 2.6 Wind Turbine Foundation Formation, Steel Reinforcement and Concrete Pour (Source: Mable Consulting Engineers)

Construction of the foundation bases will require excavation of the surrounding soil from the foundation and crane Hardstanding area to suitable bearing strata. Please refer to Table 2.5 of this Chapter and the CEMP for Excavation Volumes for further detail on excavation volumes.

The final design of the foundation will be provided by the Wind Turbine supplier Enercon and the appointed Civil Engineering Works Design Engineer, in conjunction with the Geotechnical Engineer will confirm the foundation formation make-up and bearing capacity.

2.3.2.7 Turbine Hardstand Areas

A hard standing area is required for each of the proposed turbines. Mobile and/or crawler cranes will be required during the installation and erection of the turbines and will be sited on a designated crane hardstand platform. These dedicated crane hardstands will be constructed to support the significant loads imposed by the outriggers of the main lifting crane during the Wind Turbine installation process on site. The dimension of each crane hardstand area is c. 50 metres in length and 28 metres in width.

Surrounding the crane platform smaller temporary stoned areas will be constructed. The wider stoned area measures 72m in width and 96m in length, and incorporates the turbine and foundation, crane platform, part of the access road and further provides for a parking area, assembly area, storage area and waste collection. See Figure 2.7 below and Planning Drawing 22729-202 for further details on the Hardstand.

The crane hardstand areas are permanent as they will also be used for maintenance activities while the Wind Turbines are in operation. The temporary stoned areas will be removed, and the areas reinstated on completion of the Wind Turbine erection.

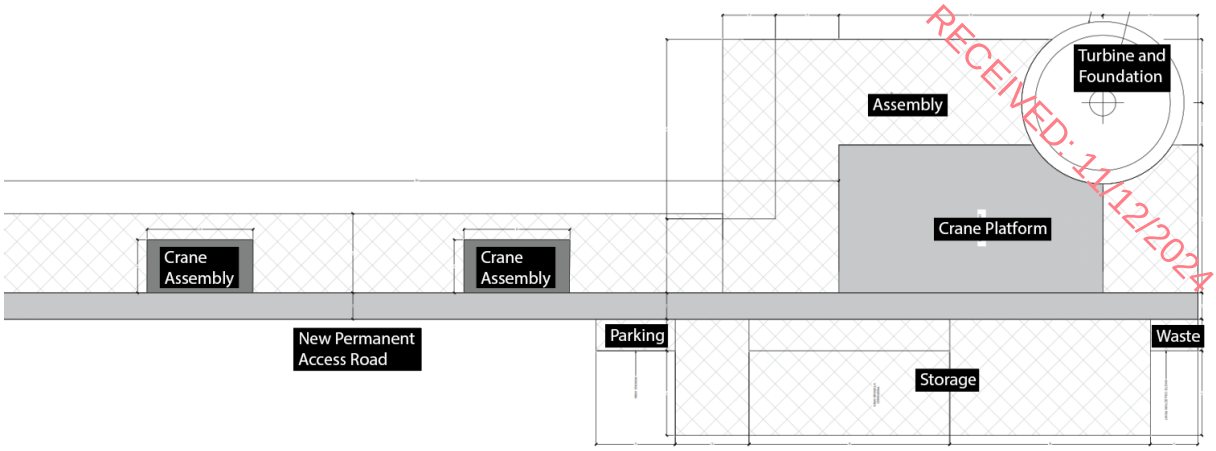

Figure 2.7 Typical Layout Hardstand Area as per Drawing 22729-202

The construction methodologies in regards to the construction of the wind turbine hardstanding area, foundation and turbine erection are included in the Construction & Environmental Management Plan, see sections 5.7.10.1,5.7.10.2 and 5.7.10.3 for full details.

2.3.2.8 Site Entrance

The proposed development includes two permanent site entrances off the local road L50462: one for the substation and meteorological mast compound, and one for wind turbines T1 and T2. Additionally, two temporary site entrances are planned: one off the local road L5046 and another off the diverted L50462. These temporary entrances will facilitate an abnormal load access road and serve as an entry to the Temporary Construction Compound. Once turbine deliveries are completed, these temporary entrances will be removed and the areas reinstated.

To prevent unauthorized use, the temporary road will be blocked by a removable barrier and will not be used for general construction traffic.

The site entrance designs adhere to TII's 2017 Rural Road Link Design, Geometric Design of Junctions standards, and the Longford County Development Plan 2021-2027. Before construction, detailed layouts will be finalized and agreed upon with Longford County Council, ensuring that surface water from the site does not flow onto public roads. This will involve constructing localized ramps at the entrances to direct water into the site.

2.3.2.9 Demolition

To facilitate the delivery of the turbine components, the demolition of a derelict structure (c. 93sqm) located at the junction L1011 and L5046 is required. The demolition will involve a systematic process to safely dismantle the structure and remove all waste materials while minimizing environmental impact.

Figure 2.8 Structure to be demolished (Source: Google)

2.3.2.10 Internal Access Tracks

The proposed development includes for the construction of a new internal access road extending 0.8 km from the L50462 local road to Turbine T2. This road will feature an excavated stone-fill base and a crushed aggregate capping, as detailed in the design drawings.

A temporary road will also be built in a field east of the L50462 and L5046 junction to facilitate abnormal load deliveries. This road will follow the same construction method as the main access road and will be removed, with the area reinstated after turbine deliveries are complete.

Additionally, the L50462 will be temporarily diverted for approximately 1 km from its junction with the L5046 to the main site entrance. During this time, the L50462 will be closed to vehicles but remain accessible to pedestrians. After turbine deliveries, the diversion will be removed, and the road reopened to both vehicular and pedestrian traffic.

Another temporary road will be constructed specifically for abnormal load deliveries this will be located at the junction of the L1011 and L5046. This road will not be used for general construction traffic and will be secured with a removable barrier to prevent unauthorized access.

2.3.2.11 Temporary Road Widening Works

As part of the development, it is proposed to upgrade a section of the L50462 from the location of the proposed Substation compound to the new permanent access road. The upgrade comprises the

temporary widening of the road from 3m to 5m. Following Turbine delivery, the temporary widening will be grubbed up and the area will be reinstated.

The proposed new permanent access road will also be complemented by temporary works to facilitate accessibility for abnormal load deliveries. These permanent works comprise a temporary turning spur, passing bays and temporary widening of the proposed access track. All temporary works will be grubbed up and ground reinstated on completion of the final delivery

2.3.2.12 Stream Crossing – Bridge Installation

A 9.1-meter clear span bridge will be constructed to cross the Unnamed Stream (EPA Code: IE_SH_26C010800) within the project area. The bridge was designed to minimise environmental disturbance, while still accommodating peak water flow during periods of heavy rainfall or storm events, ensuring that the natural hydrology of the stream remains intact.

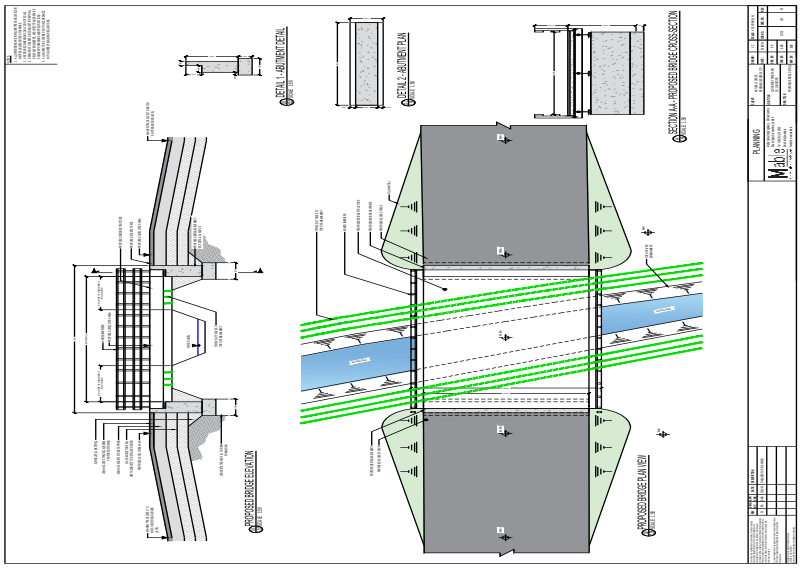

Figure 2.9 Stream Crossing – Bridge Installation

The construction methodologies in regard to the construction of the site entrance and access and temporary widening works are included in the Construction & Environmental Management Plan, see sections 5.7.3, 5.7.4 and 5.7.5 for full details of works required to facilitate access to the proposed development.

2.3.2.13 Temporary Construction Compound

A temporary Construction Compound is proposed as part of the proposed development. The compound is located at the site entrance in the north of the subject site and will be established initially during the enabling works. The proposed compound will comprise of a permeable stoned area measuring circa 2,100m² in total as shown on drawing 22729-220. Part of the compound will be fenced off with stock proof fencing and used as a as a secure storage area for construction materials and also contain temporary welfare facilities for site personnel. Facilities will include office space, meeting rooms, canteen area, a drying room and sanitary provisions. Wastewater will be stored in 3 no temporary wastewater holding tanks with a combined capacity of 24,300l. A temporary water storage tank will be used as the compounds source of water and electric power will be provided by

means of a temporary generator. The compound provides for 9 car/van parking spaces, a bunded refuelling area and is framed by 4 no CCTV and lighting poles each measuring 3.8m in height. Upon completion of the construction works the compound will be dismantled and the hardcore will be grubbed up. This hardcore will be incorporated into the final finishing of the development. The area will be backfilled with stockpiled subsoil and topsoil, landscaped and re-seeded.

The construction methodologies in regard to the construction of the Construction Compound and Facilities is included in the Construction & Environmental Management Plan, see sections 6.1 for full details.

2.3.2.14 Electrical Cabling

Each wind turbine will be connected to the proposed on-site substation via underground medium voltage (MV) cables. Fibre-optic cables will also connect each Wind Turbine to a control system located within the Control Building Module in the Substation Compound. The electrical and fibre-optic cables will be run in cable ducts c.925mm below the ground surface located off the site Access Roads. A typical cross section through the cable ducting and cable is contained in drawing 22729-240.

The construction methodologies in regards to the construction and laying of underground Electrical Cabling are included in the Construction & Environmental Management Plan See sections 5.7.9 & 5.9.4 - 5.9.11 for full details.

2.3.2.15 20kV Substation Compound

It is proposed to construct a 20kV electricity substation within the site boundary. This substation will provide a connection to the national grid via an underground 20kV transmission cable connection. The substation compound will have an area of approx. 364sq.m and be surrounded by 2.6m high palisade fencing. It will include two single-storey modular buildings constructed of pre-fabricated steel panels. The buildings will be 3.5m in height from ground level to the ridge level. There will be one modular building for the independent power provider and one for ESB. Their function will be to provide a control rooms area for future servicing and to house switch gear, control and monitoring equipment necessary for the operation of the proposed wind turbine. The construction and electrical components of the substation will be to ESB, Electrical Designer and Wind Turbine Supplier specifications. Prior to construction commencement, interception drains will be placed uphill from the planned Substation area to catch any current overland water flows and direct them downhill to minimise water contact with the construction site. The clean water will be released through a level spreader downhill from the construction site, flowing over the current vegetation.

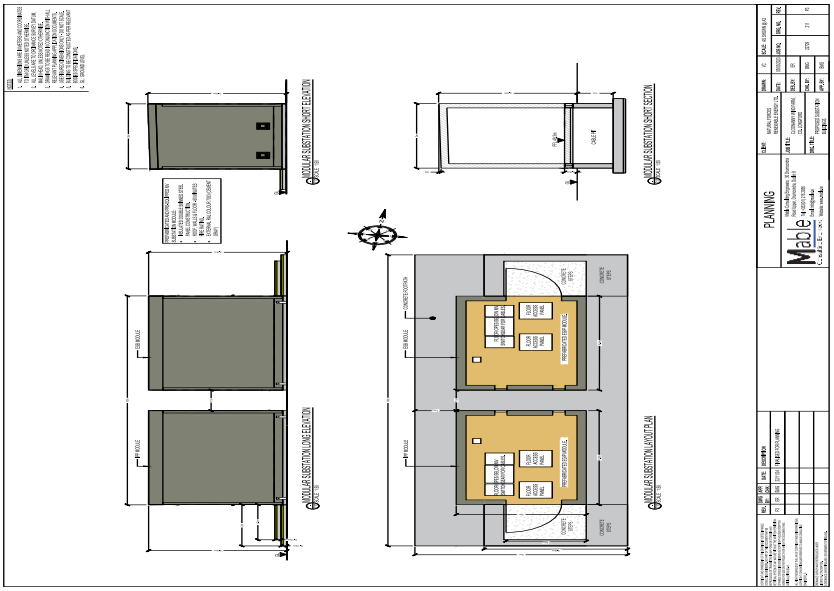

Figure 2.10 Modular Substation Layout

2.3.2.16 Battery Energy Storage System (BESS)

Battery Energy Storage Systems (BESS) are transformative technologies that play a vital role in addressing the challenges of integrating renewable energy into the electricity grid. BESS ensures a stable, secure, and efficient energy system by mitigating the intermittency of renewable energy sources. The key benefits of BESS are Grid Balance and Frequency Response and Energy Security.

A BESS provides a rapid, sub-second response to disturbances, addressing the decreasing system inertia caused by reduced reliance on fossil fuels. These systems stabilize grid frequency during periods of high renewable generation and low demand, supporting the ambitious targets of the DS3 Programme, which aims to increase renewable energy integration to 80% by 2030. The Energy storage enhances grid resilience by reducing dependence on large, centralized fossil fuel plants and their associated transmission infrastructure. This decentralization improves the grid's ability to withstand disruptions, including severe weather events, ensuring reliable energy supply.

The proposed BESS is co-located within the substation compound along with associated transformers and inverters. As per figure 2.11 20kV Substation Compound & BESS.

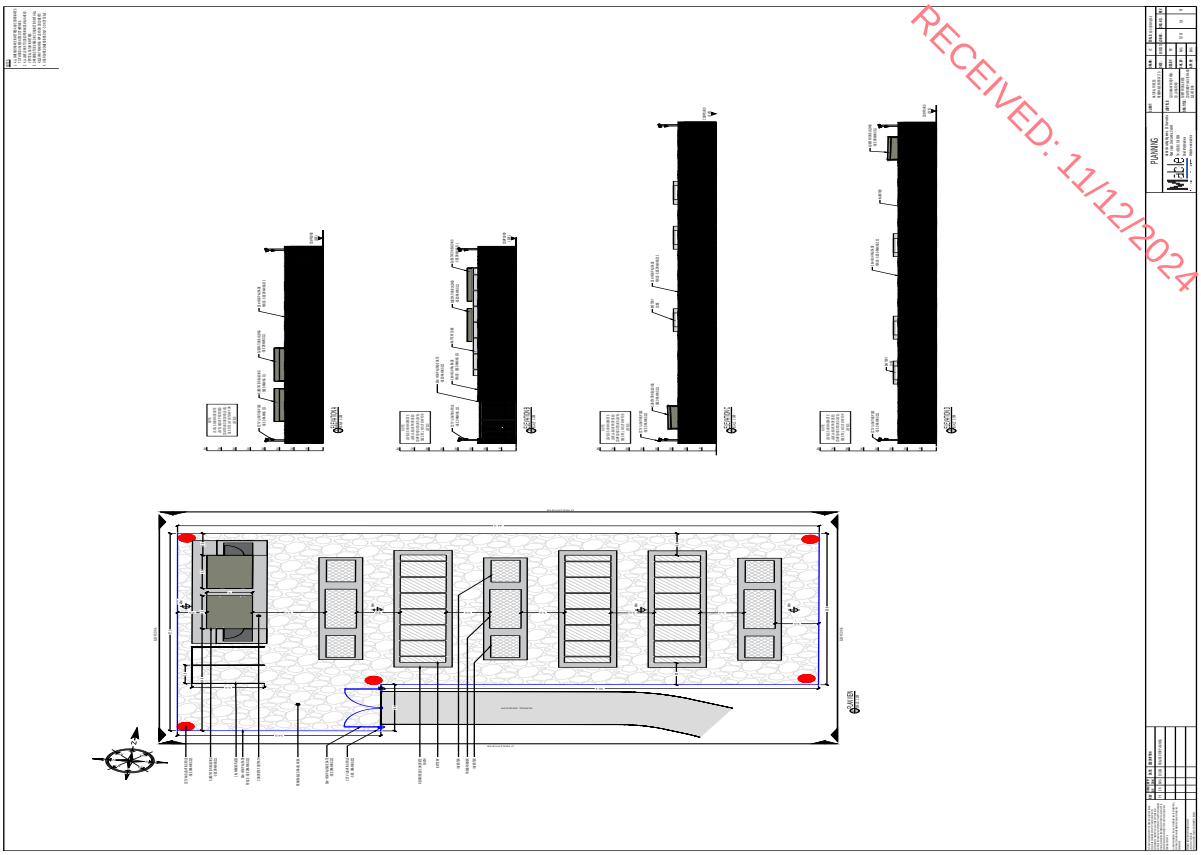

Figure 2.11 20kV Substation and BESS Compound Layout

Figure 2.12 BESS Example

3 No. Bess Units will be installed within the substation compound, each BESS unit contains 6 battery modules which each house battery racks (typically Lithium-Ion) with associated Transformers, inverters and interconnecting power and control cabling to be located on concrete plinths as per figure 2.12. The battery modules will typically house control systems, fire detection, and fire suppression systems with cooling systems which are further detailed in the CEMP and Appendix 2.2 Fire Risk Assessment

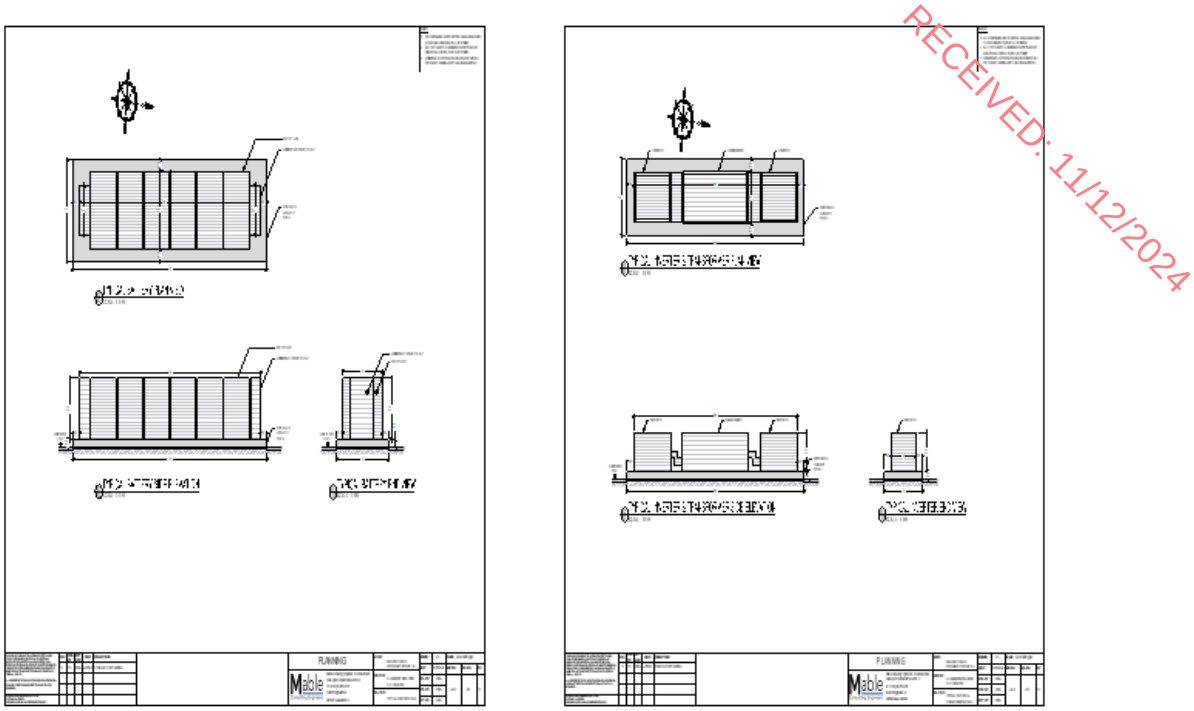

Figure 2.13 BESS, Inverter & Transformer Elevations

Each BESS unit comes with associated communication interfaces at a combined size of 3m width, 15m length and 2.5m height. Each unit is mounted on a separate concrete plinth measuring 4m by 16m at 0.3m above compound level. Each unit is accompanied by an inverter and transformer unit measuring 2m by 13m with a height of 1.6m, also mounted on a concrete plinth, each measuring 3m by 14m at 0.3m above compound level.

The concrete plinths will be cast on site and constructed using reinforced concrete, designed to Eurocode 2: Design of Concrete Structures & BS EN 1992-1-1:2004+A1:2014.

The modular design allows for minimising on-site construction as each modular component is manufactured off-site and transported to site for final assembly. Therefore, each BESS unit will be transported to site already built and the site works required are limited to installation, connection via cables and commissioning. Inverters and transformers will also be transported to site as complete functional units ready for installation and connection on site

The construction methodologies in regard to the construction of the 20kV Substation & BESS Compound are included in the Construction & Environmental Management Plan, see sections 5.7.8 for full details.

2.3.2.17 Meteorological Mast

A permanent meteorological mast (Met Mast) with a height of 32m will be installed as part of the proposed development. The mast will be a steel lattice tower structure, prefabricated off site and will be equipped with wind monitoring equipment at various heights. The mast will be located to the south

of the proposed Substation as shown on drawing 22729-102 and will be accessed via the L50462 and the Substation compound.

The Met Mast will be constructed on a hardstanding area sufficiently sized to accommodate the crane that will be used for its erection. It will be grounded in reinforcement concrete foundation, measuring 5m in length and width and 1.5m in depth. 15 tonnes steel reinforcement will be required for the Met Mast Base construction.

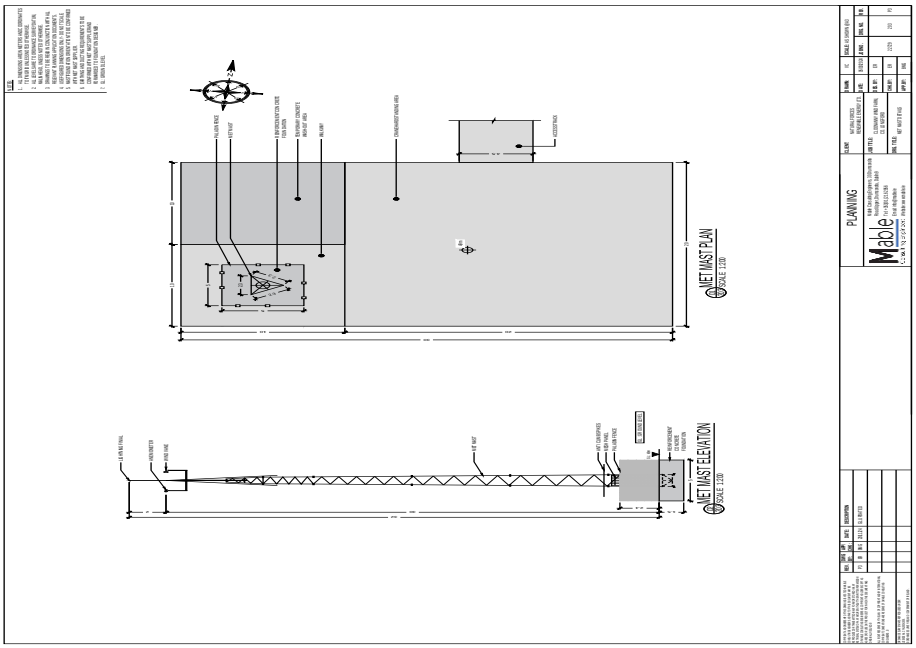

Figure 2.14 Elevation of Proposed Met Mast

The construction methodologies in regard to the construction of the meteorological mast (Met Mast) are included in the Construction & Environmental Management Plan See sections 5.7.11 for full details.

2.3.3 Grid Connection Options

The point of connection to the national grid will ultimately be decided by EirGrid or ESB Networks, as the independent electricity system operators with statutory competent responsibility. The precise means of connection will be dependent on a range of factors and at the discretion of the system operators.

As per the 1927 Electricity (Supply) Act, the Electricity Supply Board (ESB) is the only approved statutory body allowed to connect, operate and own electrical distribution infrastructure. As a result, the exact grid connection route/methodology will only become apparent at the time when ESB are undertaking their detailed design review of the project grid connection works.

In order for the project to ascertain a grid connection from ESB, the project must first be in receipt of a full grant of planning permission and have applied via the ESB's Enduring Connection Process (ECP). Once a grid connection offer is applied for via the ECP, ESB can then commence their detailed design

works and determine the most suitable substation to connect the proposed development into. It is understood from publicly available information from ESB, that there is sufficient grid capacity at each of the following substations Richmond 110kV Longford 38kV and Glebe 38kV.

Given the process and timelines for agreeing a grid connection with ESB, the proposed grid connection is to be excluded from the subject application for permission (red line boundary). Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

However, in order to assess the proposed development in it's whole, the potential grid connections have been assessed in this EIAR to provide a comprehensive environmental assessment of all aspects associated with the proposed development. Therefore, three points of connection and their associated cable routes are under consideration and have been fully assessed by the applicant as a part of this EIAR and the CEMP:

1. Connection to Existing Richmond 110kV Substation.
2. Connection to Existing Longford 38kV Substation
3. Connection to Existing Glebe 38kV Substation.

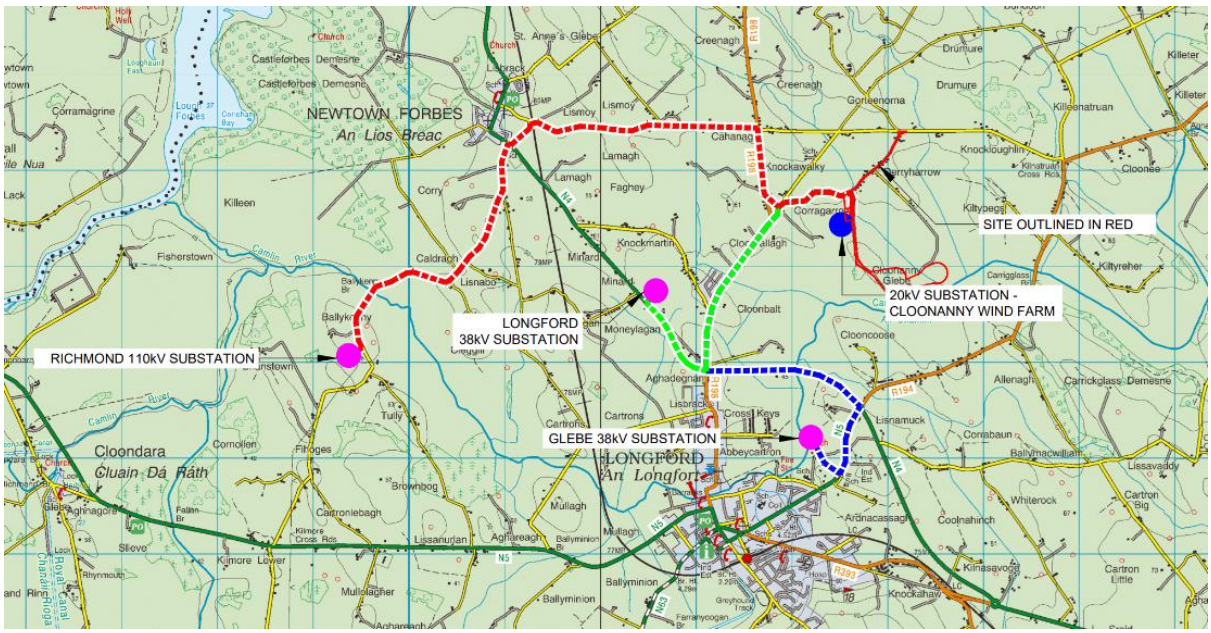

Figure 2.15 Overview Grid Connection Options

An overview of each grid connection route is presented below. Details on cable trenching for each route are contained in the CEMP **Error! Reference source not found.**

- Option 1 – Connection to Existing Richmond 110kV Substation

  This connection option consists of connecting the proposed development to the national electricity grid via circa 8km of underground 20kV electrical cabling connecting to Richmond 110kV Substation in the townland of Ballykenny, County Longford. The majority of the grid

connection will be constructed in public roads. This connection option involves crossing of the Camlin River and an Iarnród Éireann Irish Rail line. It is proposed to directional drill these sections of the grid route works – see Section **Error! Reference source not found.** for details on directional drilling. The remaining sections will be installed in ducts which will be laid in excavated trenches. Cable trenching along the public road will be carried out in the road verge or in the grassed area on the side of the road where possible. This will depend on the space available in the verge and offset requirements from the existing services. Where there is insufficient space at the edge of the road or in the grassed area to the edge of the road, the cable will be installed in the roadway.

- Option 2 – Connection to Existing Longford 38kV Substation

  This connection option consists of connecting the proposed development to the national electricity grid via circa 4km of underground 20kV electrical cabling connecting to Longford 38kV Substation in the townland of Minard, County Longford. Cable trenching along the public road will be carried out in the road verge or in the grassed area on the side of the road where possible. This will depend on the space available in the verge and offset requirements from the existing services. Where there is insufficient space at the edge of the road or in the grassed area to the edge of the road, the cable will be installed in the roadway.

- Option 3 – Connection to Existing Glebe 38kV Substation

  This connection option consists of connecting the proposed development to the national electricity grid via circa 5.9km of underground 20kV electrical cabling connecting to Glebe 38kV Substation in the townland of Lisnamuck, County Longford. This connection option involves crossing of the Camlin River. It is proposed to directional drill this section of the grid route works – see Section **Error! Reference source not found.** for details for details on directional drilling. The remaining sections will be installed in ducts which will be laid in excavated trenches. Cable trenching along the public road will be carried out in the road verge or in the grassed area on the side of the road where possible. This will depend on the space available in the verge and offset requirements from the existing services. Where there is insufficient space at the edge of the road or in the grassed area to the edge of the road, the cable will be installed in the roadway.

The construction methodologies in regard to the construction and laying of underground Electrical Cabling are included in Construction & Environmental Management Plan, see sections 5.9. for full details.

2.3.4 Turbine Delivery Route

The turbine delivery route and associated accommodation works have been fully assessed as a part of the EIAR, the assessment can be found in Chapter 6 Material Assets Roads Traffic and Transport, The CEMP and the Preliminary Traffic Management Plan PTMP

Large components associated with the proposed development will be transported to site via the identified turbine delivery route (TDR). It is proposed that turbine deliveries shall approach the site as summarised below

1. Starting at Belview Port;
2. N29 (Waterford City By-Pass) to the N25;
3. N25 to N9;
4. N9 National Road to M9 Motorway;
5. M9 Motorway and Merge onto M7 Motorway;
6. Continue on M7 Motorway to N7 National Road;
7. N7 National Road and merge onto M50 Motorway;
8. At junction 7 exit onto N4 National Road;
9. N4 National Road to M4 Motorway;
10. M4 Motorway to N4 National Road;
11. Exit N4 National Road onto R194 Regional Road;
12. Turn left at Kiernans cross junction onto the L1011;
13. Turn left onto L5046;
14. Turn left onto L50462;
15. Continue to Site Entrance.

The components for each wind turbine are delivered in separate loads, some of which are abnormal in terms of their width and length. The components are transported from Belview Port to the site via motorways and the national, regional and local road networks. Prior to construction of the turbines, a transportation plan will be prepared by the Wind Turbine component delivery company. Permits for moving the abnormal loads on the public roads to the site will be obtained from An Garda Síochána and the local authorities on the selected haulage route. Temporary accommodation works will be required at selected locations along the TDR to facilitate the delivery of large components to the site. All temporary accommodation works associated with the TDR shall be fully reinstated following the construction stage. Overhead utilities and obstructions will need to be removed at several locations to provide adequate overhead clearance. The removal of overhead utilities will be by either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site. Temporary accommodation works will only be required during the operational phase in the unlikely event of a major turbine component replacement. The temporary accommodation works will not be required for the decommissioning phase as turbine components can be broken up on site and removed using standard HGVs.

The delivery route is presented in Figure 2.16.

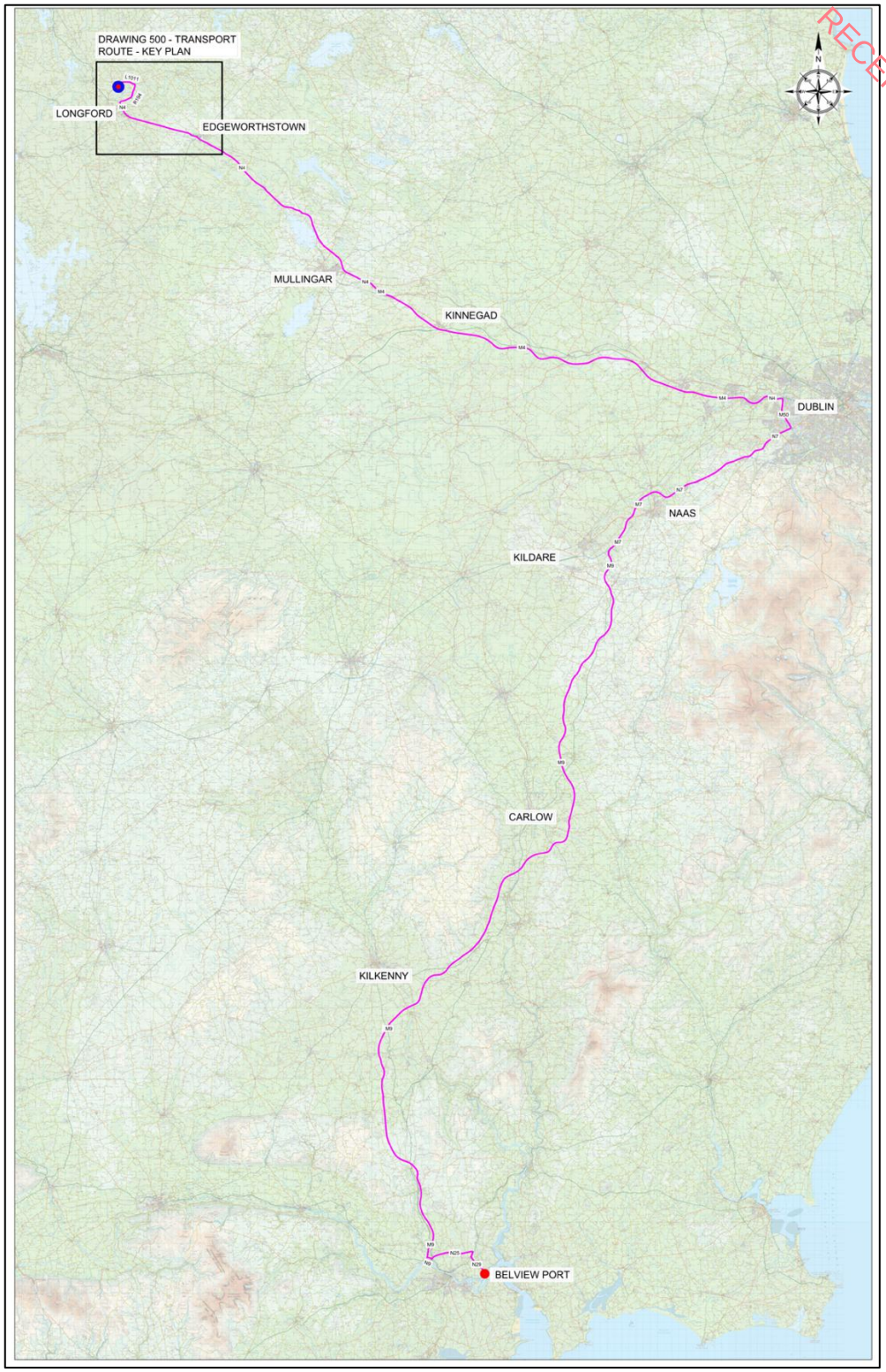

Figure 2.16 Turbine Transport Route

The construction methodologies in regards to the construction and upgrading of the TDR are included in the Construction & Environmental Management and the Preliminary Traffic Management Plan.

2.4 Project Construction

The proposed development will be constructed in accordance with the detailed plans, methodologies, and reports submitted as part of this planning application. All construction activities will adhere to the relevant planning guidelines, industry best practices, mitigation and construction methodology outlined in each of the EIAR Chapters and all planning conditions outlined by Longford County Council in granting planning permission.

2.4.1 Duration and Phasing of the Proposed Development

It is anticipated that the overall construction of the development will take approximately 24 months from starting on-site to final commissioning of the Wind Turbines.

Table 2.4 below details the works in 10 key phases, of which some will run in parallel, as indicated in an indicative Gantt Chart Programme in Figure 2.17 below.

Phase	Activity	Estimated Duration
1	Detailed Design Stage – For Construction - Detailed Civil, Structural and Electrical Design Works - Planning Compliance Works - Environmental Compliance Works - Pre-Construction Surveys	6 months
2	Civil Engineering Enabling Works - Setting out site boundaries - Tree and hedge cutting - Site entrance works to create access - Temporary Construction Compound - Advance drainage works and silt control measures	2 months
3	Civil Engineering Main Site Works - Upgrade and Widening of Public Road in Vicinity of Site - Access Road Construction - Crane Hardstand Construction - Drainage Works - Initial Reinstatement Works (Pre-Turbine Delivery) - Final Reinstatement Works (Post-Turbine Delivery)	10 months (Pre-Turbine Delivery) 2 months (Post-Turbine Delivery)
4	Structural Engineering Works - Wind Turbine Foundation Construction - Met Mast Foundation Construction - Substation Construction	5 months
5	Turbine Circuit Connector Ducting and Cabling	2 months
6	Turbine Delivery Route Works	2 months

Phase	Activity	Estimated Duration
7	Turbine Delivery, Erection and Commissioning	6 months
8	Site Electrical Works - Employer (IPP) Electrical Installations & Commissioning - ESB Networks Electrical Installations & Commissioning	4 months
9	Grid Connection Works - Ducting Works - Cable Installation Works - Final Connection Works in ESB Substation	5 months
10	Wind Farm Final Commissioning	1 month
Total Duration on Site (Some Phases will be carried out in parallel)		**24 months**

Table 2.4 Proposed Development Construction Stage Duration and Phasing

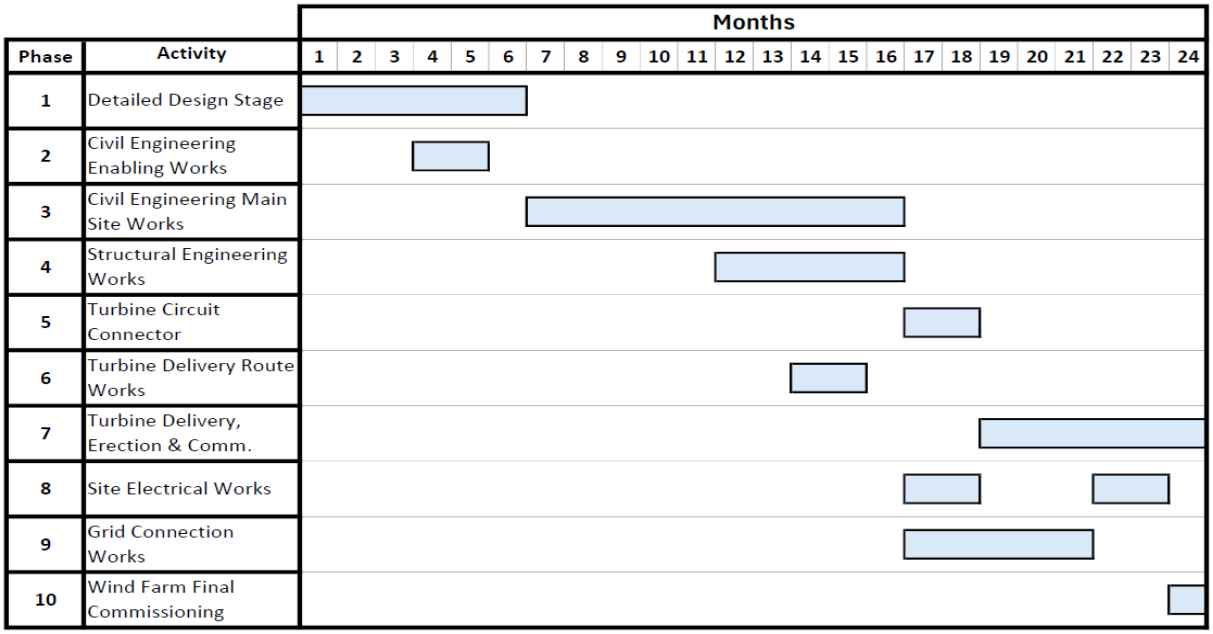

Figure 2.17 Indicative Gantt Chart Programme for Key Construction Phases

2.4.1.1 Construction Personnel

It is anticipated that approximately 25 persons will be directly employed during peak construction activities.

2.4.1.2 Construction Hours

The hours of construction activity will be limited to avoid unsociable hours, where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs on weekdays and between 07:00hrs and 14:00hrs on Saturdays.

However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours or to accommodate delivery of large turbine components along

public routes), it may be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with Longford Co. Co.

2.4.1.3 Pre-Commencement & Enabling Works

Prior to the commencement of construction, all preconstruction planning conditions will be discharged with Longford County Council which will include the updating of the CEMP in advance of mobilisation to site. Upon mobilisation to site enabling works will commence these works will include setting out the site boundaries, tree and hedge cutting, site entrance works, construction compound construction and advance drainage works and silt control measures.

2.4.1.3.1 Construction in a Flood Zone

A Site-Specific Flood Risk Assessment (SSFRA), including hydraulic modelling and flood zone delineation has been prepared for the subject development and accompanies this application as a standalone document and should be referred to for detailed information.

The SSFRA concludes that southwestern part of the site is subject to primary flood risk which can be attributed to an extreme fluvial flood event in the Camlin River located adjacent to the southern site boundary. The site is not at risk of pluvial or groundwater flooding. The location of proposed turbine no.2 falls within a delineated Flood Zone 'A' and Flood Zone 'B'. Proposed turbine no.1, the proposed BESS, the 20kV substation and MET mast and the BESS compound does not fall within a delineated flood zone.
Given the location of Turbine T2 in a flood zone the CEMP includes *EMP16 – Construction in Flood Zone Management Plan* to detail measures for managing the construction of infrastructure within flood zones, specifically focusing on protecting excavations, infrastructure, and watercourses from river flooding, while minimizing environmental impacts and ensuring site safety.

The EMP states that, generally, concrete pours for the construction of the turbine foundation will be scheduled for the dryer summer months, where the risk of flooding is lower, to avoid negative impacts on the environment and waterbodies in the vicinity and minimise weather-related delays.

A relatively deep excavation is to be carried out to facilitate the foundation of T2, this will be open for a number of weeks while the foundation is being constructed, to protect this excavation from flooding, and prevent pollution of runoff water, a flood protection berm will be constructed around the excavation, as detailed in drawing 22729-156. Construction materials will be stored either inside the protection berm or outside of the flood zone area and topsoil and subsoil will be stored outside of the flood zone area.

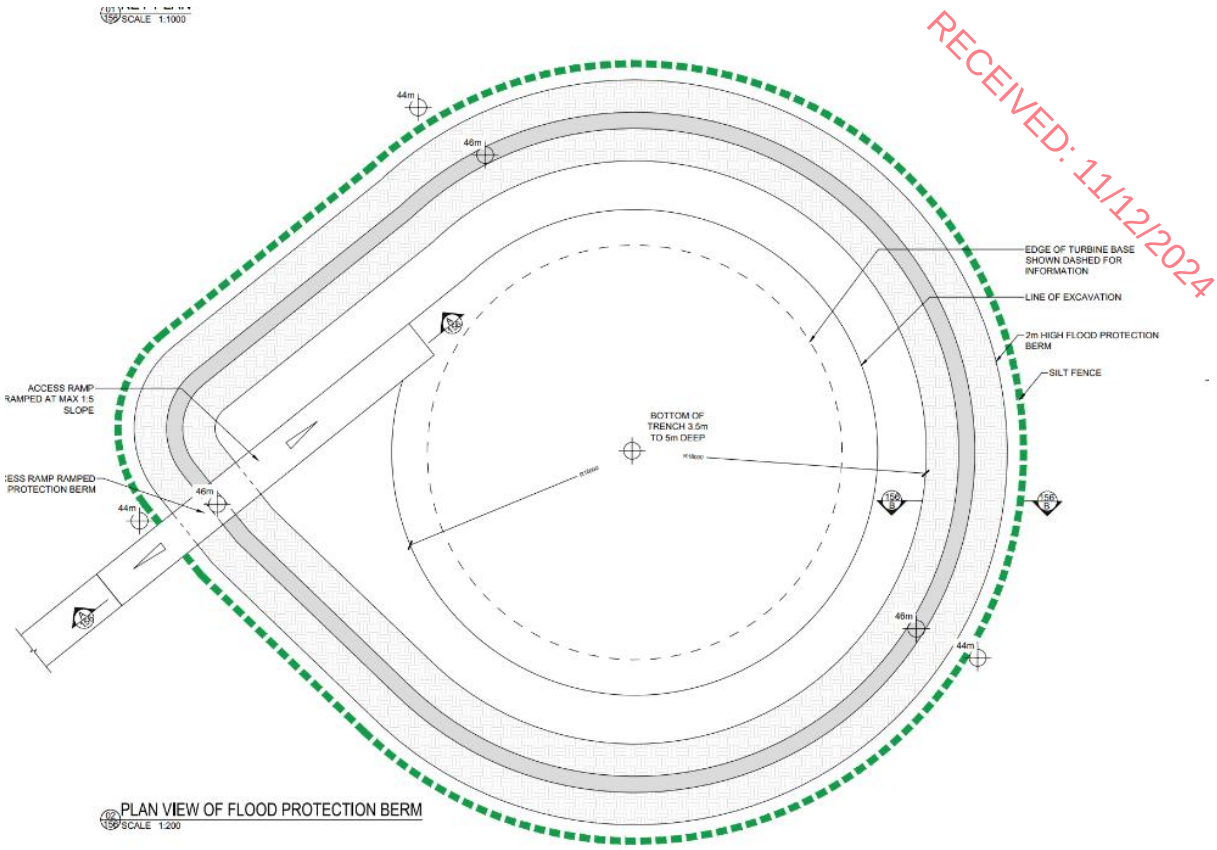

Figure 2.18 Plan view of Flood Protection Berm (Drawing 22729-156)

2.4.1.3.2 Spoil Management

All material excavated on site over the course of the construction works will be retained on site and incorporated into the works where suitable. During the Construction stage, excavated topsoil and till will be stored separately in temporary dedicated repositories located surrounding the temporary construction compound area, substation and BESS area, along the access road and the turbine hardstand areas. Temporary spoil storage areas are identified on drawings 22729-101 to 104. Upon completion of the construction works, all remaining excavated material will be integrated into the final landscaping, blending seamlessly with the existing terrain to avoid leaving any mounds of spoil around the site. Estimated excavation volumes are detailed in Table 2.5 below

Topsoil will be excavated in the presence of the Project Archaeologist. Contamination of topsoil with other excavated material will not be allowed. Other excavated spoil will be reused as site fill where it is suitable. A dirty water drain will be installed on the down slope side of Repository areas.

Table 2.5 Estimated Excavation Volumes

Infrastructure Element	Area m^2	Depth m	Volume Topsoil m^3	Volume Subsoil m^3
Turbine 01 - Foundation	707	5	141	3,534
Turbine 02 - Foundation	707	5	565	2,969
Turbine 01 - Hardstand	1,400	1.0	280	1,120
Turbine 02 - Hardstand	1,400	1.0	1,120	280

Temporary Hardstand Stoned Areas	9,436	0.3	4,089	0
Access Road	11,810	0.75	5,118	3740
Access Road Widening & Temporary Roads	5,594	0.75	2,424	1,771
Substation and BESS Compound	1,005	0.6	302	302
Substation Building	140	1.6	42	182
Met Mast Hardstand	400	1.0	120	280
Met Mast Foundation	25	1.5	8	30
Internal Cable Route	488	0.9	211	228
External Cable Route*	2,600	0.9	390	1,950
Temporary Compound	2,100	0.45	630	315
		Total	15,440	16,700

*The grid route with the longest length was used for this calculation

2.4.2 Construction & Environmental Management Plan (CEMP)

A Construction & Environmental Management Plan (CEMP) accompanies the planning application. The document sets out the key environmental management and construction measures associated with the construction, operation and decommissioning of the proposed project, to ensure that during these phases of the project, the environment is protected, and any potential impacts are minimised.

The document is a live document and will form part of the main Civil Construction works Contract, the document will be developed further and / or amended where necessary taking into account of planning condition requirements, including any additional mitigation measures and any information which may be made available from additional consultations, site surveys etc.

2.4.3 Surface Water Management and Site Drainage (SWMP)

A Surface Water Management Plan (SWMP) is included in Appendix C of the CEMP. The plan provides a comprehensive framework for managing drainage, maintaining water quality, and addressing hydrological concerns during all phases of the proposed development: construction, operation, and decommissioning. The plan is designed to mitigate impacts on the natural flow regime, water quality, and surface runoff quantities.

The SWMP ensures the proposed development will not adversely affect the hydrological or environmental conditions of the site. Its measures include tailored drainage solutions, separation of water flows, frequent inspections, and robust flood risk assessments, ensuring compliance with environmental and planning guidelines. The hydraulic modelling for Turbine 2 confirms no significant flood risks, with mitigation measures in place to preserve the local hydrological regime.

Further details on hydrology and drainage are contained in Chapter 9 Hydrology and Hydrogeology, the SWMP, the CEMP and on accompanying planning application drawings. The proposed drainage details are shown on Planning Drawings 22729 -150 to 22729 -156.

The Surface Water and Drainage Measures to be implemented as a part of the construction of the proposed development are included in the Surface Water Management Plan (SWMP) See sections 4.7 for full details and a brief summary below:

Two distinct methods will be employed in the management of construction surface water runoff. The first method involves 'keeping clean water clean' by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas. The second method involves collecting any drainage waters from works areas within the site that might carry silt or sediment, and nutrients, and to route them to Settlement Ponds prior to controlled diffuse release over vegetated natural surfaces. At construction stage there will be no direct discharge to streams or rivers; and all release of Wind Farm drainage is to be carried out outside of hydrological buffer zones which have been identified for all watercourses in the vicinity of the site.

There are several drainage ditches and one stream within the project area that require appropriate crossings. The drainage ditches will be crossed using piped culverts and the existing stream will be crossed using a bridge crossing. As part of the project development process, a Section 50 consent will be sought from the Office of Public Works (OPW) for any works that may affect watercourses, drainage systems, or flood risk management in the areas.

Surface Water Drainage Measures that will be implemented at Construction and Operation Stage will include:

Clean Water Cut-off Drains: Clean Water Cut-off Drains will be installed upgradient of works areas to collect surface flow runoff and to prevent it reaching excavations and construction areas of the Site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment

Dirty Water Cut-off Drains: Dirty Water Cut-off Drains will be installed downgradient of works areas to collect surface flow runoff and to prevent run off from excavations and construction areas of the site into existing watercourse, where it might have come into contact with exposed surfaces and picked up silt and sediment. The drains will be used to take runoff from the works area to a location where it can be treated via settlement ponds or other silt and sediment removal measures.

Silt Fencing: Silt fences will be installed as a water protection measure along cut-off drains and around existing watercourses and around existing access track road crossing culverts and pipes.

Check Dams: The velocity of flow in the Clean Water Open Drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive. Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam.

Swales: Swales are shallow drains that will be used to intercept and collect run off from construction areas of the site during the construction and operational phase.

Buffered Outfalls: Buffered Outfalls will be constructed at the end of Cut-off Drains, Silt Ponds and other Control Measures to convert concentrated flows into diffused sheet flow on areas of vegetated ground.

Settlement Ponds: Settlement Ponds will be used to attenuate runoff from works areas of the Site during the Construction Stage. On completion of the construction works, Settlement Ponds will also

be provided at permanent works drainage outfalls to attenuate flows from the development and to manage the quality of surface water flows during the Operational Phase.

Silt Buster: A "Siltbuster" or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas, if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit.

Silt Bags: Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site.

Sedimats: Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag.

Vegetation Filters: Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions.

Further details in relation to all measures can be found on planning drawings 22729-150 to -153

2.4.4 Preliminary Traffic Management Plan (PTMP)

A Preliminary Transport Management Plan (PTMP) has been prepared having regard to the proposed development. The plan outlines the requirements for managing transport and logistics associated with the proposed development through the construction, operational and decommissioning phases.

It includes an overview of the project, site access details, and delivery routes assessment, along with traffic impact assessments, vehicle management guidelines, and safety measures to ensure compliance with regulations. The plan addresses communication strategies for stakeholder engagement, environmental considerations to minimize impacts, and procedures for monitoring and adjusting traffic conditions.

In advance of mobilisation to site this plan will be updated by the main contractor and agreed with the local authority to ensure compliance with all relevant planning conditions and regulation.

2.4.1 Construction Waste

Wastes will be generated during the construction stage of the proposed Project, with some minimal quantities during maintenance works once it's operational. Exact quantities are not known at this stage. All wastes generated will be handled, transferred and disposed in accordance with relevant waste management legislation. The proposed development is not anticipated to have a significant effect, in terms of waste generation and management.

Best practice procedures in general will minimise waste generated on-site. Measures including good site management will be taken to limit the quantity of waste generated during construction phase. Waste such as excavated material on-site will be recycled where possible. A Waste Management Plan has been included in Appendix A of the CEMP.

The construction of the proposed development will be generated during the construction stage of the proposed development, with some minimal quantities during maintenance works once it's operational. Exact quantities are not known at this stage. All wastes generated will be handled, transferred and disposed in accordance with relevant waste management legislation. The proposed development is not anticipated to have a significant effect, in terms of waste generation and management.

2.4.2 Health and Safety

The design and construction of wind energy developments is governed by the Safety, Health and Welfare at Work Act 2005 and by S.I. No. 291 of 2013 the Safety, Health and Welfare at Work (Construction) Regulations 2013 (H&S Construction Regulations). Safety, Health and Welfare management for the development will include the following:

1. During the detailed design stage of the project a Preliminary H&S Plan will be prepared by the PSDP and circulated to designers, potential contractors and other stakeholders. This plan will identify potential safety hazards associated with the site and the works and assess the associated risks. Mitigation and control measures will be recommended to minimise the identified risks.
2. The Preliminary H&S Plan will then be developed further by the PSCS to create the Construction Stage H&S Plan for the works. This plan will address all safety and health aspects of the construction process and provide relevant contact details and emergency response procedures for the project.
3. The Construction Stage H&S Plan will detail the site induction and training requirements for site personnel.
4. Evidence of completion of construction safety training, typically in the form of a Safepass Card, will be required from all construction personnel prior to commencing work on the site.
5. A record of Safepass Cards and personnel approved for entrance to site will be completed as part of a site induction process.
6. Where relevant, equipment operators or specialist works will require personnel to hold a valid Construction Skills Certification Scheme (CSCS) card.
7. All equipment and machinery used on site will be appropriately certified for its intended purposes.
8. The Employer via the Construction Manager will ensure that only competent contractors are appointed to carry out construction works on the site.

2.4.2.1 Safety and Security

Members of the public will be prevented from accessing the development site through implementation of adequate security measures. A contact information board will be erected at the site entrances. All those entering the site during construction will be required to sign in at the Temporary Construction Compound on site. Security fences will be erected at the perimeter of active construction areas to prevent unauthorized entry. These fences will be regularly inspected and maintained. Security measures will be in place at all times when construction activities are not taking

place to safeguard site materials and equipment. This will include fencing, locked off areas, surveillance systems and security lighting.

Materials will be stored in the Temporary Construction Compound and fuels and chemicals will be stored it the bunded areas within the compound. The compound will be secured by means of a 2.4m high perimeter chain-link fencing with secure access gates.

2.4.2.2 Construction Signage

Warning signs will be erected at the construction works areas to notify people of the construction site and of particular construction related risks in area. Signage will be regularly inspected by the site management team to ensure that they are securely fixed and in good condition.

A notice board will be erected at the site entrance and at the Construction Compound gates with information on the contact details for site management, PPE requirements for the site and any other information deemed necessary in accordance with the H&S Plan. Within the site, maximum speed signage will be erected along the Access Roads for construction vehicles and health and safety signage will be erected where deep excavations, or other areas of increased risk, are occurring. Signage will also be erected as a reminder to concrete delivery drivers that concrete truck wash-out is not permitted on-site and to direct concrete lorries to the concrete washout area. Signage will be erected on the L5046 and L50462 Local Roads both sides of the site entrance locations to warn approaching vehicles, cyclists and pedestrians of the construction site entrance location and the potential presence of slow-moving vehicles. Signage will also be erected along the public road during grid connections works.

2.4.3 Reinstatement

On completion of the ground works, the work areas will be landscaped and reinstated with stored topsoil and either seeded out with native species or allowed to vegetate naturally.

2.5 Operation & Maintenance

The Proposed Development is expected to have a lifespan of approximately 35 years. Planning permission is being sought for a 35-year operation period commencing from the date of full operational commissioning of the development.

During the operational period, on a day-to-day basis the wind turbines will operate automatically, responding to control systems to changes in wind speed and direction there will be no other activities on site and agricultural activities will continue as normal.

The turbines will be connected, and data relayed to an off-site control centre. Each turbine will also be monitored off-site by the wind turbine supplier. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored at an off-site control centre 24-hours per day.

To ensure long-term safe and optimum operation of the wind energy converters, the proposed project will require maintenance, but generally the site will be unmanned.

During maintenance, all safety-relevant and main components and functions are checked, and all other components are visually inspected to check for any irregularities or damage. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The electricity substation and site tracks will also require periodic maintenance. In exceptional circumstances there may be an occasional need to replace some major turbine components, but these will be very infrequent.

Waste will be generated during the operation phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best practice and all regulations in a licensed facility.

Further details on the operation phase are provided in each chapter of this EIAR as they relate to each environmental factor.

At the end of the lifespan, a decision will be made in relation to repowering or decommissioning the proposed development. This process would be subject to a separate planning application.

2.6 Decommissioning

A Preliminary Decommissioning Plan is included with the CEMP that accompanies this planning application. The design life of the Proposed Development is 35 years after which time decommissioning will occur, unless planning permission is granted to extend the duration of operation. Prior to commencement of any decommissioning, a decommissioning plan will be prepared for agreement with Longford Co. Co.

In the event the development is not granted an extension of life, Wind Turbines, Met Mast, Substation, BESS and all their associated above ground components will be dismantled and removed from the site using appropriate present-day decommissioning and reinstatement practices and applicable future practices.

The Final Decommissioning Plan will detail a material recycling and disposal plan and traffic management plan and other similar mitigation measures to those implemented during the construction phase according to best practice procedures at the time.

During decommissioning, structures will be dismantled in the opposite order of their construction. Wind Turbine and other components located above ground will be dismantled and taken off-site for recycling. The Wind Turbine foundations and hardstanding portions will be left in place underneath and covered with soil to allow for natural revegetation or reseeding. After completion of decommissioning works the affected areas will be reinstated to their former agricultural use. The site access road will continue to serve the area beyond the operation of the proposed development. These uses include forest/agricultural and recreational access. Therefore, subject to agreement with Longford Co. Co. it is proposed to keep the site access road in place for future use.

All decommissioning and reinstatement activities will be agreed in advance with the Planning Authority. See Appendix 2.3 for further detail in regard to a preliminary decommissioning plan for the proposed development.

CHAPTER 3
ALTERNATIVES CONSIDERED

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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3 Alternatives

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) outlines the consideration of Alternatives in relation to the Proposed Development as described in chapter 2 as required by Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations 2001 (as inserted by article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which state (at paragraph 1(d);

> *"A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment".*

The requirement is elaborated at paragraph 2(b), which makes clear that reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The Regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects be presented in the EIAR.

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022 states:

> *"The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required."*

The Guidelines also state that the range of alternatives considered may include the 'do-nothing' alternative.

Notwithstanding the above, pursuant to Section 3.4.1 of the 2022 EPA Guidelines, the consideration of alternatives also needs to be cognisant of the fact that:

> *"in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant 'alternative location'…"*

The Guidelines are also instructive in stating:

> *"Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR… It should be borne in mind that the amended Directive refers to 'reasonable alternatives… which are relevant to the proposed project and its specific characteristics'".*

This section of the EIAR provides an outline of the main alternatives examined throughout the design and consultation process. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. The type of alternatives depends on the nature of the project proposed and the characteristics of the receiving environment. The assessment of alternatives is considered under the following headings:

i. 'Do-nothing' Alternative,
ii. Alternative Use,
iii. Alternative Locations,
iv. Alternative Project Design & Layout,
v. Alternative Technical Solutions.

3.2 Consideration of Alternatives

3.2.1 'Do Nothing' Alternative

The 'Do-nothing' alternative is a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed (EPA, 2022). Each Chapter of this EIAR includes a description of the 'Do Nothing' alternative and should be referenced in conjunction with this Chapter.

Under a 'Do-nothing' scenario, the Proposed Development would remain unchanged in its current condition, serving largely as pastureland. The site would continue to be managed according to existing farming practices.

Implementing the 'Do Nothing' alternative would result in a missed opportunity to contribute toward addressing Government targets to produce electricity from renewable energy which would be lost in such a scenario. Moreover, the opportunity to generate developer contributions and community benefits from the Proposed Development would be lost along with local employment, investment opportunities and subsequent benefits to the local economy.

It should be noted that the existing agricultural land use of the site will be continued in any case, in the 'Do Nothing' scenario or in tandem with the Proposed Development.

The following Table summarises the effects of the 'Do Nothing' alternative described above.

All the predicted effects are determined to be likely to occur. It is noted that the duration of effects under this scenario are considered at least short-term (1-7 years), this reflects a reasonable timeframe for a further application for development to come forward on the site in the absence of this subject application.

Aspect	Quality of Effect	Significance	Context	Duration
Population & Human Health	Neutral	N/A	County	Short-term
Landscape & Visual	Neutral	N/A	County	Short-term
Material Assets: Traffic & Transport	Neutral	N/A	Local	Short-term
Material Assets: Utilities	Neutral	N/A	Local	Short-term
Land & Soils	Neutral	N/A	Local	Short-term

Water & Hydrology	Neutral	N/A	Local	Short-term
Ornithology	Neutral	N/A	Local	Short-term
Biodiversity	Neutral	N/A	Local	Short-term
Noise & Vibration	Neutral	N/A	Local	Short-term
Air Quality	Negative	Moderate	County	Short-term
Climate	Negative	Moderate	County	Short-term
Cultural Heritage	Neutral	N/A	Local	Short-term

Table 3.1 Do Nothing Description of Effects

In conclusion, the 'Do-Nothing' scenario is an inappropriate and unsustainable alternative that would prevent the delivery of critical renewable energy in line with the Government's and the EU's targets. With the mitigation measures proposed in this EIAR and having regard to the findings that no significant effects on the environment are expected for the Proposed Development, the Proposed Development is significantly positive when the comparative environmental effects is considered.

3.2.2 Alternative Uses

The principal determinant for the suitability of uses at this site is governed by the Land Use policies outlined in the Longford County Development Plan (LCDP) 2021–2027. The subject site is neither within any identified Settlement Boundary nor part of a Rural Settlement Cluster, and therefore, no specific land use zoning applies to this location.

In the absence of specific zoning, a reasonable alternative scenario for the subject site would be to continue its current use as low-intensity agricultural land. However, this would not support the objectives of increasing renewable energy production or reducing greenhouse gas emissions. Further details on the 'do-nothing' alternative, can be found above in Section 3.2.1.

Notwithstanding the above, the LCDP recognises that rural areas have the potential to be harnessed for renewable energy projects. As set out in Section 5.8.1, the LCDP acknowledges the importance of wind energy as a renewable energy source which can play a vital role in achieving national targets in relation to reductions in fossil fuel dependency and greenhouse gas emissions.

The LCDP also identifies a range of other development types that may be suited to rural areas including rural enterprise, forestry, horticulture, equine industry and rural tourism.

It is noted that the anticipated environmental effects of an alternate land use strategy for this site would be similar as the approach to the build stage would be comparable. Thus, as determined in this EIAR, with the correct implementation of standard construction management measures, significant effects during the construction stage, including noise, dust and traffic, would be short-term in duration and the significance would range from not significant to at worst moderate.

3.2.3 Alternative Locations

3.2.3.1 Site Selection

It is critical for wind farm development to be located at a highly suitable site i.e. in areas with suitable grid capacity, wind resources, access, set back from constraints such as housing & environmental designated areas etc.

Some locations have more inherent issues than others for wind energy development and can be avoided in favour of alternative sites that have fewer constraints and adequate capacity to accommodate a wind farm.

The Applicant has carried out extensive site finding exercises across county Longford and the surrounding area to identify suitable sites for wind energy development.

Ideally any site which is identified should be in an area with a suitable wind resource and have the capability of being successfully planned and developed when site specific constraints and planning criteria are considered.

This section of this chapter sets out the main reasons for choosing the Proposed Development and outlines reasons for excluding others that were under consideration.

3.2.3.2 Site Screening

When identifying the Proposed Development site the Applicant evaluated several potential locations for the wind farm development through a thorough 3 -phase screening process.

3.2.3.2.1 Phase 1 - Initial GIS Screening & Local Authority Consultation

Phase 1 of site screening involved assessing a range of constraints to determine available and suitable land for wind farm development on GIS.

This process began by generating exclusion areas buffers that did not meet key criteria, such as:

- Locations unable to achieve a minimum setback distance of 500 meters from residential dwellings,
- Areas situated more than 10 kilometres from a grid connection point,
- Natura 2000 and Nationally Designated Sites (SAC, SPA, NHA, pNHA),
- National Parks and Nature Reserves,
- Sites of Archaeological Importance,
- Lands already committed for other developments, including farm partnerships and leased lands,
- Areas classified as 'Non-Preferred Locations' for wind development, as per Appendix 2 Map “Areas of Wind Farm Potential” of the Longford County Development Plan 2021-2027.

In parallel with this constraint assessment, the Applicant also assessed land ownership and the willingness of landowners to facilitate the Proposed Development at identified locations.

3.2.3.2.2 Phase 2 – Constraint Mapping

Constraint mapping, which involved establishing buffer zones (separation distances) around various types of constraints to clearly identify areas where development is to be avoided was carried out. The size of each buffer zone was determined by the recommendations set out in the ‘Best Practice Guidelines for the Irish Wind Energy Industry’ (Irish Wind Energy Association, 2012) and the ‘Wind Energy Development Guidelines’ (Department of the Environment, Heritage and Local Government, 2006). The Draft Revised Wind Energy Development Guidelines, December 2019 (Draft WEGs 2019) is an update to the 2006 Wind Energy Planning Guidelines. However, it is important to note that the 2006 guidelines are still officially in effect.

Aspect	Receptor	Buffer (metres)	Source
Noise & Shadow Flicker	Residential dwellings	800 (4x tip height)	Draft WEGs 2019
Hydrology	Watercourses	50	Best Practice Guidelines for the Irish Wind Energy Industry
Archaeology	Archaeological sites and monuments	50	Professional judgement & National monument records
Public infrastructure	Public roads and railways	220 (topple distance plus 10%)	2006 & Draft WEGs 2019

Table 3.2 Constraints and their Corresponding Buffers

3.2.3.2.3 Locations Considered

During phase 1 & 2 of the screening process, four potential development locations were evaluated. Based on the findings, the number of viable sites was narrowed down, and Cloonanny Glebe was selected as the most favourable location for the Proposed Development.

Details of the alternative sites and the reasons they were not selected are provided in Table 3.3, along with corresponding maps.

Option	Location	Main reason not Chosen	Figure
1	Kilmore Upper	Complex, peat-rich soil	3.1
2	Mount Jessop	Too distant from the grid	3.2
3	Carrickglass Demesne	Access issues and proximity to pNHA	3.3

Table 3.3 Alternative Locations

Figure 3.1 Alternative Location 1

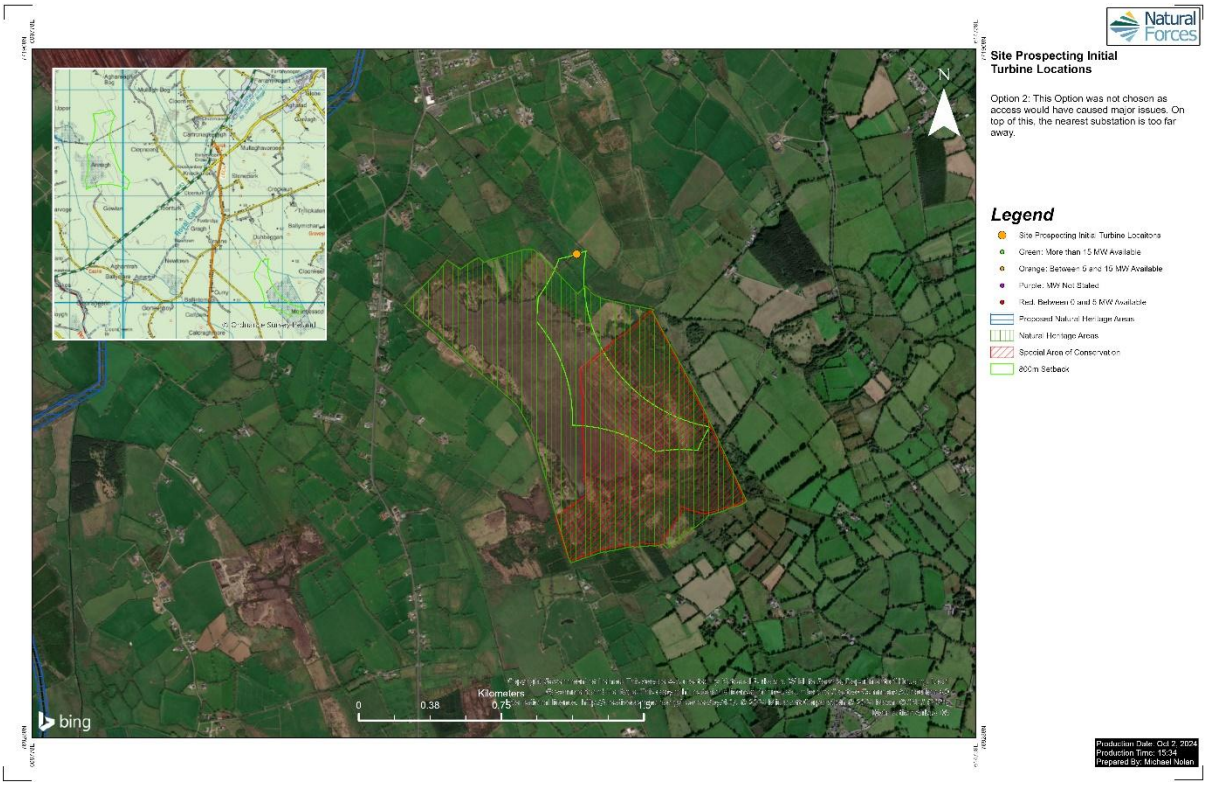

Figure 3.2 Alternative Location 2

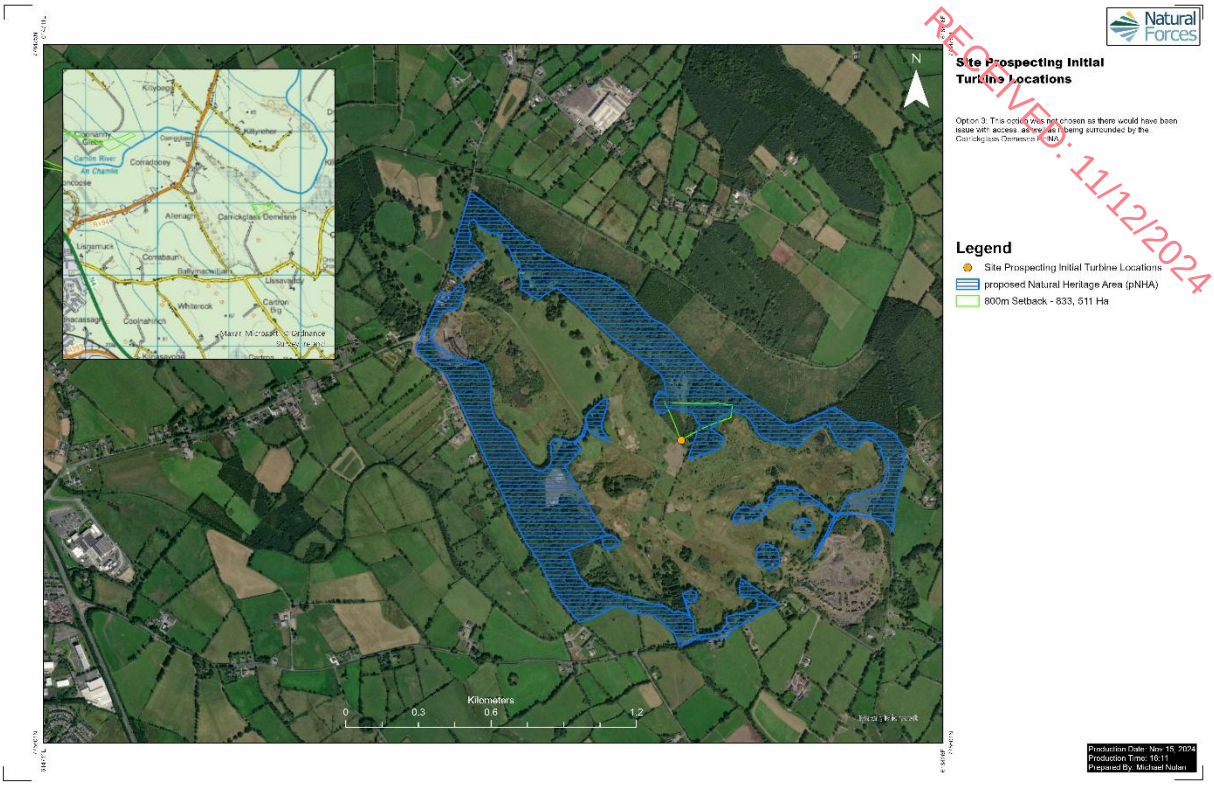

Figure 3.3 Alternative Location 3

3.2.3.2.4 Phase 3 – Feasibility studies

Based on the findings of the constraint mapping a feasibility study was conducted to evaluate the suitability of the proposed development of a wind farm to be located at Cloonanny Glebe.

This study involved an analysis of various factors, including residential setback, the electricity grid, wind speeds, environmental designations, archaeology, and cultural heritage, transport and a Pre-Planning Meeting was held with Longford County Council in December 2020 (Ref 2514) and notes from the meeting were considered for the final design.

3.2.3.2.4.1 Residential Setback

The proximity to residential dwellings is a significant factor in site selection to ensure that residential amenity is not adversely impacted by the Proposed Development. A setback distance of four times the maximum tip height (4 x 199.9m = 799.6m) of a wind turbine from residential properties was applied.

3.2.3.2.4.2 Electricity Grid Capacity & Connection

The potential of grid capacity, and connection was considered, this including distance to potential connection points and the capacity of the grid connection points to accommodate the Proposed Development.

Proximity to a suitable grid connection point is important in this regard as this will be a fundamental determinant in ensuring that such projects are viable and thus able to contribute to the wider

governmental objectives of reducing our carbon footprint and achieving 80% renewable electricity by 2030.

3.2.3.2.4.3 Wind Speeds

The wind resource is an important consideration when selecting a candidate site for a wind energy development. In general, larger turbines are considered viable where the average wind speed is greater than 7m/s at 100m above ground level. The Irish Wind Atlas, produced by the Sustainable Energy Authority of Ireland (SEAI), displays average wind speeds throughout the country. A minimum wind speed of 8 m/s at 100 metres was established as a criterion for site suitability as this level is thought to be necessary for commercial viability in wind energy projects. The Proposed Development, which records wind speeds between 8 and 8.25 m/s at this height, meets this requirement.

3.2.3.2.4.4 Environmental Designations

The Proposed Development is not located within any area designated for ecological protection i.e. there are no sites designated under the EU Habitats Directive (SACs), EU Birds Directive (SPAs), NHAs or pNHA's in or directly adjacent to the Proposed Development.

3.2.3.2.4.5 Archaeology & Cultural Heritage

No National Monuments, Recorded Monuments, Protected Structures or items listed in the NIAH are located within the proposed development site.

Given the greenfield nature of the Proposed Site the potential exists for sub-surface features and deposits to exist therein. However, through the employment of appropriate mitigation measures such considerations can be given due regard during the planning and development of the project.

3.2.3.2.4.6 Landscape Sensitivity

Longford County Development Plan 2021-2027 includes a Landscape Character Assessment in Appendix 11. The subject site is in Unit 4, the Central Corridor. The sensitivity of the landscapes in this unit are generally LOW. Potential areas of MEDIUM to HIGH sensitivity exist in the vicinity of protected woodlands, riverbanks and in the vicinity of the Aquifer.

The Central Corridor is further characterised as follows:

- The main landcover constituent in this unit consists of agricultural pastures.
- The land is flat and low-lying, rarely breaking the 100-metre contour line, meaning that trees, field boundaries, buildings and other features restrict views over any significant distance.
- Drainage is toward the Shannon via a complex network of Rivers and Streams accessing the Camlin River, which is subject to seasonal flooding.
- A wide range of architectural and cultural heritage is present in this area.

The Development Plan acknowledges a high capacity for absorption of additional development as an opportunity for this landscape character type. It also identifies the pollution of Groundwater sources in the vicinity of the aquifer to the north of Longford Town, Loss/fragmentation of important agricultural land/tree stands and woodlands, and continued ribbon development in pressure areas as threats.

3.2.3.2.4.7 Transport

Proximity to well-maintained transport routes is crucial for wind farm projects, ensuring efficient and safe transportation of large turbine components, reducing logistical costs, and minimising disruptions to local communities. The Proposed Development benefits from direct and reliable access for transporting materials and equipment, as it is located approximately 2 km from the N4.

3.2.3.2.4.8 Local Authority Consultation

Once a site passed this initial stage of screening and landowner interest was established, the Applicant engaged with the local authority to understand their perspective and preliminary views toward the proposed project.

At this stage the findings of the initial screening, constraint mapping and feasibility study are presented and depending on the outcome of this meeting the company decide whether to proceed to planning or look for other development opportunities or locations.

On the 10.12.2020 the Applicant had an initial pre-planning engagement meeting with Longford County Council. The purpose of this meeting was to provide an outline of the Proposed Development and confirm the councils view and observations in respect of the proposed development and desk based assessment. The meeting was positive and therefore it was decided to proceed with a planning application.

3.2.4 Alternative Project Design

This section outlines the alternatives considered during the design and pre planning submission stage of the Proposed Development and explains the key rationale and factors that led to the selection of the proposed design.

The project design has evolved to account for contributions from various experts, such as engineers, ecologists, hydrological, geotechnical, archaeological specialists, telecommunication specialists, and traffic consultants and landowners.

The project design has also been revised throughout the design stage based on site investigations and feedback from consultations with the local community, and Longford County Council. The purpose of design iterations is to minimise environmental impact while creating a feasible and viable project.

A comprehensive description of the final version of the Proposed Development can be found in **Chapter 2 Development Description** of this EIAR.

3.2.4.1 Turbine Layouts

A preliminary turbine layout option as illustrated in **Figure 3.4** was created focussing on positioning maximum turbine quantity on site. A minimum separation distance of two times the rotor diameter (350m) between the turbines was established. This allowed for 4 turbines to be positioned on the subject site.

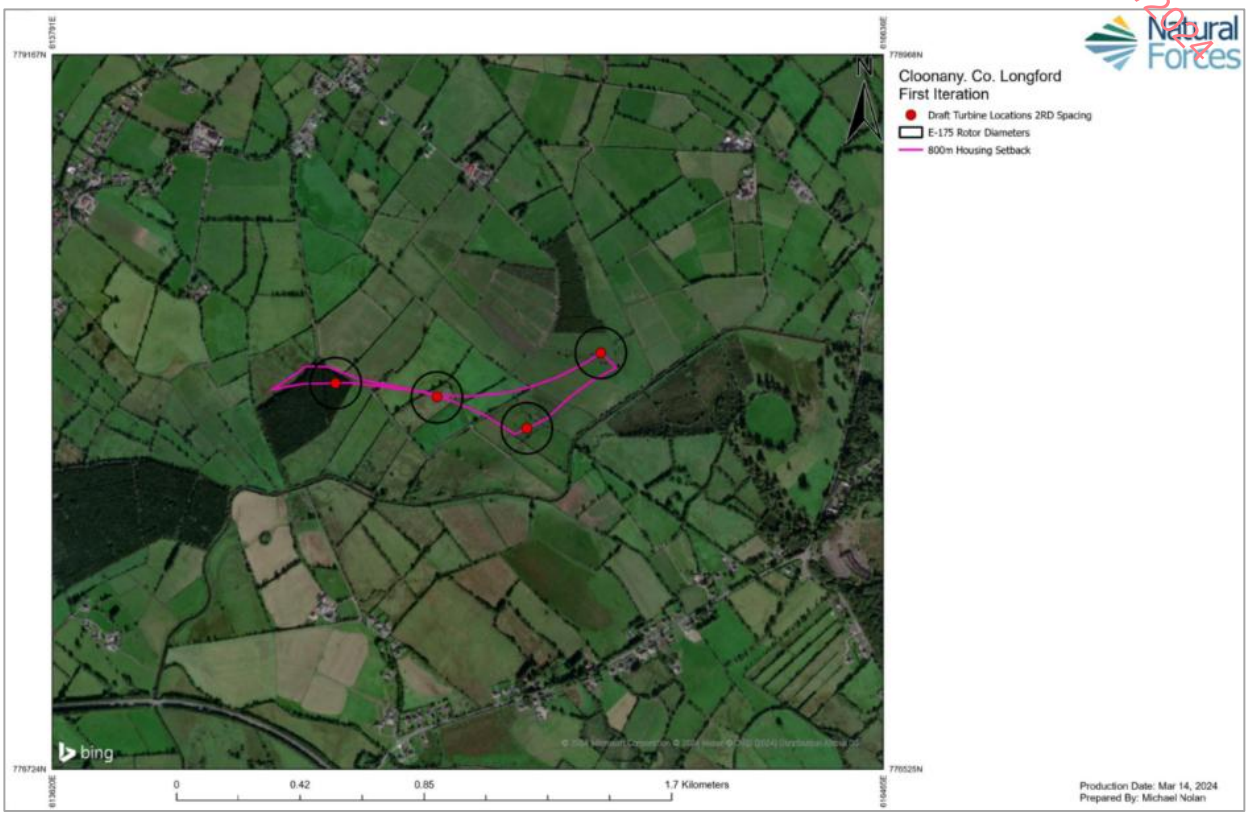

Figure 3.4 Alternative Turbine Layout 1

An alternative layout option as illustrated in **Figure 3.5** was prepared in which the turbine quantity was reduced to allow for a greater spacing of 2.5 times the rotor diameter (437m) between the turbines. This allows for reduced turbulences and an increased electricity generation potential per turbine.

Figure 3.5 Alternative Turbine Layout 2

Based on the initial site layouts 1 and 2, a Telecoms Impact Assessment was conducted by AI Bridges. The assessment, as available in Appendix 7.1 of **Ch. 07 Material Assets - Built Services**, revealed several telecom links interacting with the proposed site.

Figure 3.6 Alternative Turbine Layout 2 Showing Telecommunication Links

The layout was further revised to a 2 turbine layout to ensure the Proposed Development did not pose an impact on the telecommunication links.

Figure 3.7 Turbine Layout Final Iteration Showing Telecommunication Links

A 2-turbine layout was the ultimate solution to ensuring no disruption to telecommunications surrounding the site.

Additional benefits associated with the 2-turbine layout compared to the former layouts include:

- Decreased Built Footprint: With two turbines instead of four, there is a notable reduction in the built footprint required for project infrastructure, including access tracks, turbine foundations, substations, and hardstand areas. A smaller footprint lessens the amount of land disturbance and reduces the need for extensive earthworks and excavation.
- Reduced Impact on Water Quality: A smaller footprint and reduced need for excavation decrease the likelihood of soil erosion and sedimentation, which could otherwise impact nearby water bodies.
- Lower Turbine Noise Emissions: The greater spacing between the turbines and the reduced total number of turbines lowers the cumulative noise output from the wind farm. This reduction benefits both wildlife in the area and nearby residents.
- Reduced Visual Impact: A two-turbine layout decreases the landscape and visual impact of the project and aligns with community feedback as detailed in the Community Consultation Report in **Appendix 1.3**, which favoured a 2-turbine over a 4-turbine layout.

3.2.4.2 Site Access

When considering the design of access tracks, two options were evaluated: initially the access track was designed to maximise the use of the existing road networks during construction and provide for a temporary access track for abnormal loads connecting with the L50462 (Figure 3.8). Following feedback from the project specialists (hydrology and ecology) it was decided to amend the site access to preserve water quality within the Derryharrow Stream by reducing the potential for sediment and run off into the watercourse(Figure 3.9).

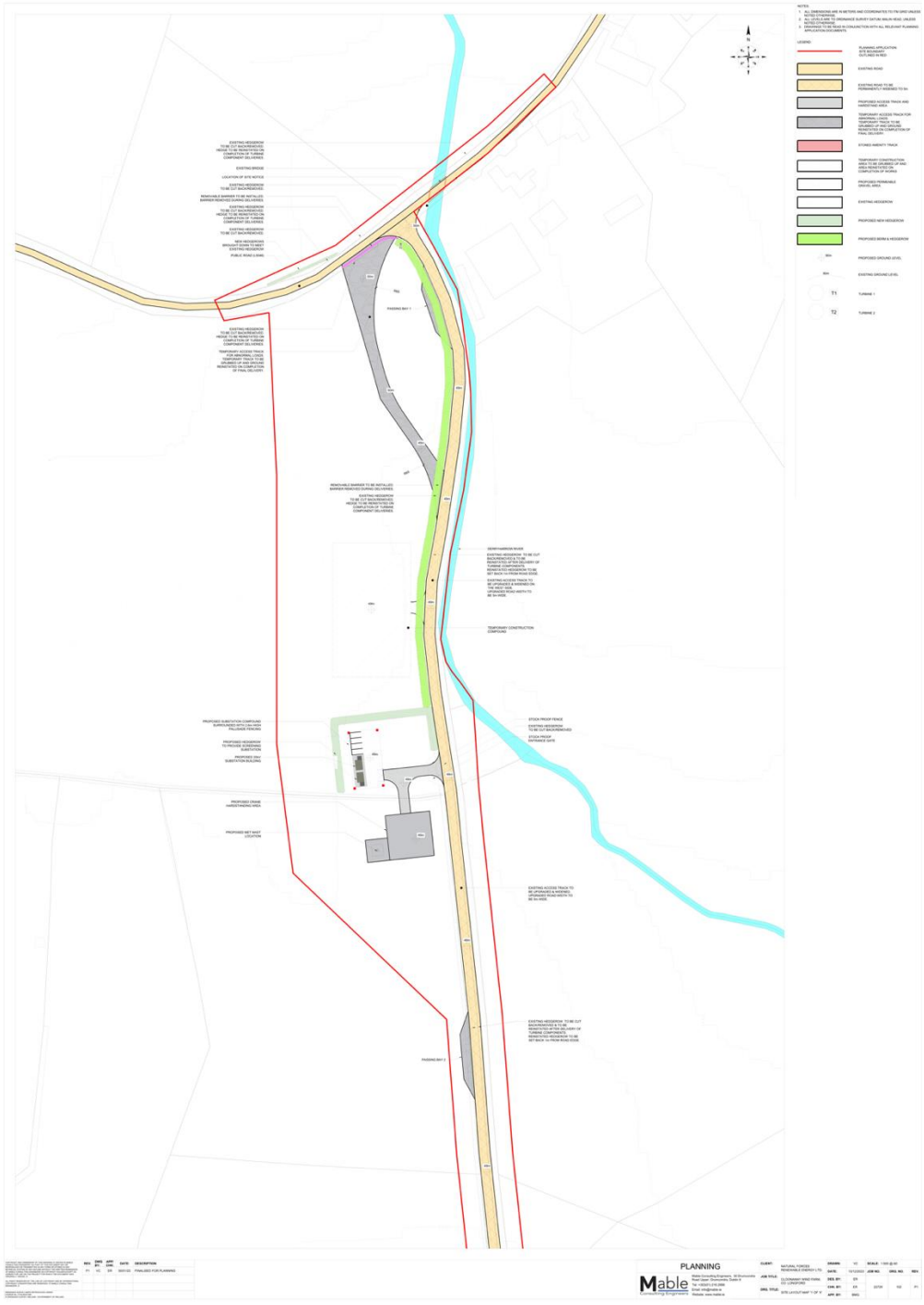

Figure 3.8 Alternative Access Track

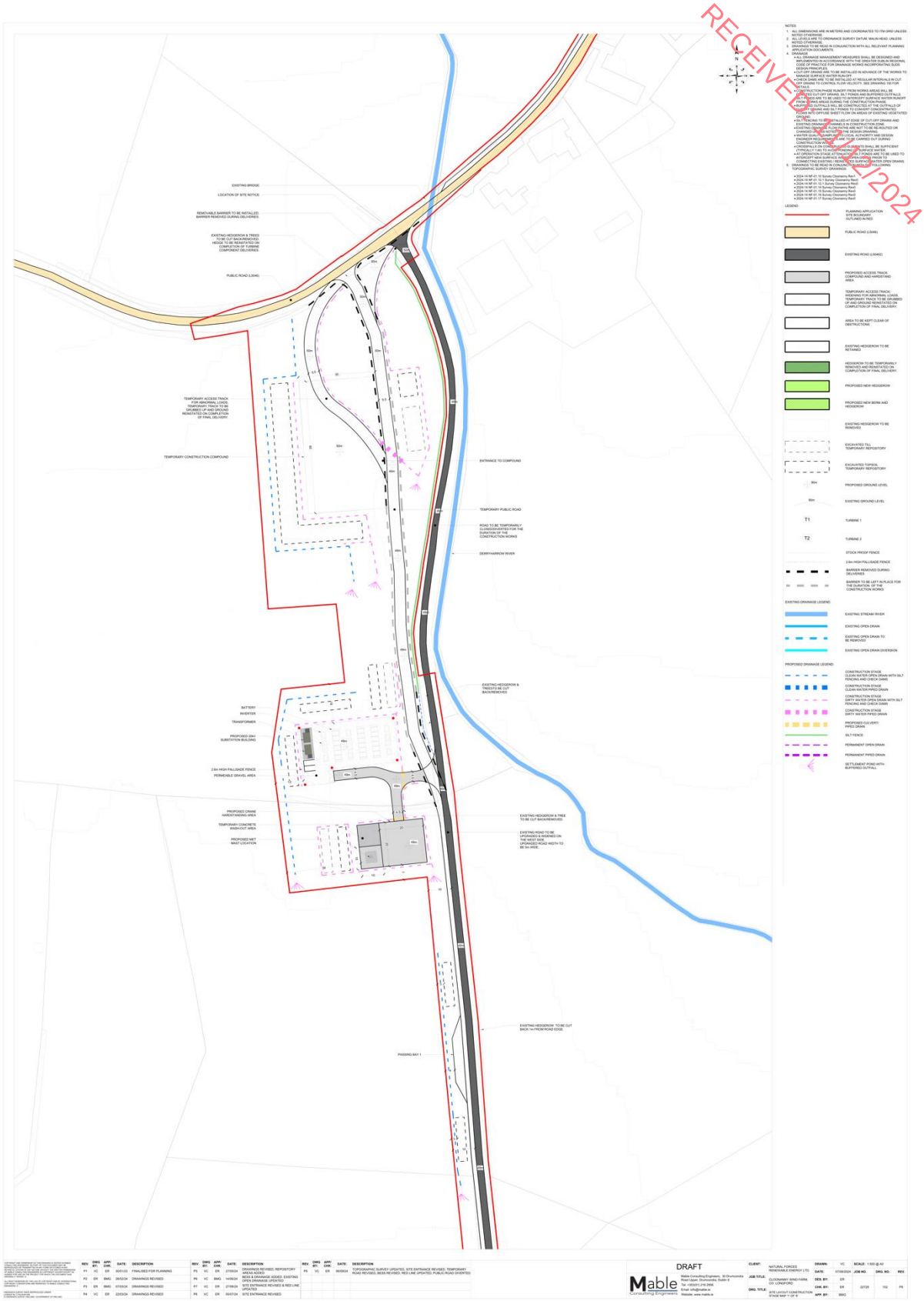

Figure 3.9 Finalised Access Track

3.2.4.3 Grid Connection

3.2.4.3.1 Connection type

Two types of grid connection were initially considered for the proposed development: Overhead Line (OHL) and Underground Cable (UGC). While OHL is more cost-effective, UGC offers greater durability, resilience, and is less susceptible to damage, while also having no visual impact. The 2019 Draft Revised Wind Energy Development Guidelines endorse the use of UGC for connecting wind energy projects to the national grid.

"In general, it is considered that underground grid connections for wind energy projects are the most appropriate environmental and/or engineering solution, particularly in sensitive landscapes where the visual impacts need to be minimised. Therefore, this should be the default approach..."

[Page 42, Draft Wind Energy Development Guidelines 2019]

Additionally, current ESB and Eirgrid policies favour utilising public road infrastructure for grid connections. Given these factors, UGC is considered the preferred option for connecting the Proposed Development to the grid. Furthermore, adopting UGC would reduce impacts on historic bridges along the route, including Balkenny Bridge and the Railway Bridge, both of which are listed in the National Inventory of Architectural Heritage (NIAH). This approach not only minimises visual and environmental disturbance but also helps preserve the cultural heritage of these significant structures.

3.2.4.3.2 Connection point

Five potential grid connection points surrounding the site were identified:

- Glebe 38kV Substation (approx. 6km),
- Longford 38kV Substation (approx. 4km),
- Richmond 110/38kV Substation (approx. 8km),
- Edgeworthstown 38kV Substation (approx. 12.5km),
- Roosky 38kV Substation (approx. 13km).

Of the list above this was reduced to the three nearest substations due to proximity and available capacity to the Proposed Development. Each of the stations were further evaluated, and their indicative route options are illustrated in Figure 3.10.

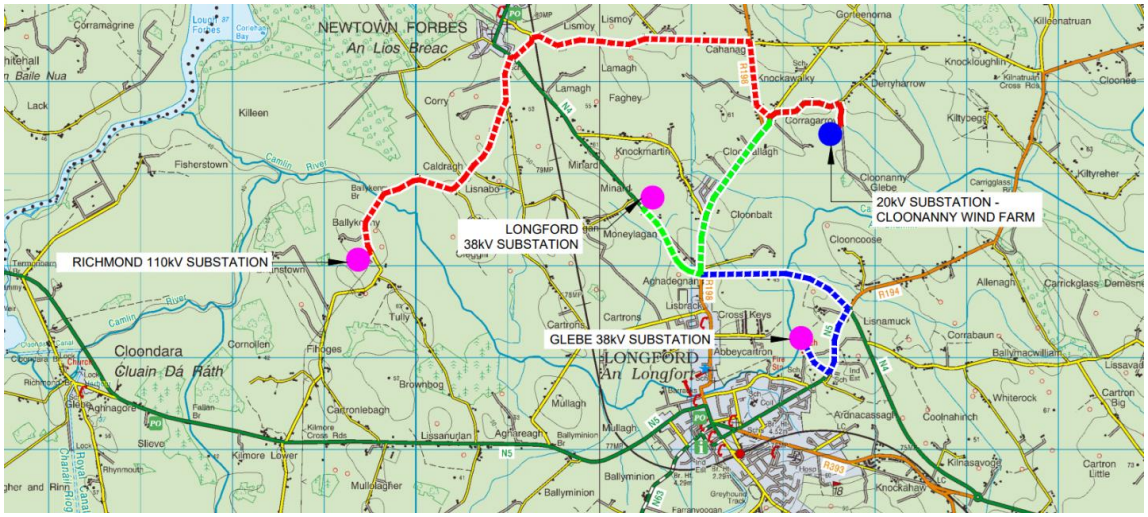

Figure 3.10 Three Considered connection points and grid routes

As per the 1927 Electricity (Supply) Act, the Electricity Supply Board (ESB) are the only approved statutory body allowed connect, operate and own electrical distribution infrastructure. As a result, the exact grid connection route/methodology will only become apparent at the time when ESB are undertaking their detailed design review of the Proposed Development grid connection works.

For the Proposed Development to ascertain a grid connection offer from ESB, the development must first be in receipt of a full grant of planning permission and have applied via the ESB's Enduring Connection Process (ECP).

Once a grid connection offer is applied for ESB can commence their detailed design works and exact routing of the grid connection infrastructure from the proposed on-site substation building (referred to as the Point of Connection {PoC}) to an existing ESB infrastructure (referred to as the Point of Common Coupling {PCC}).

To this point, the applicant has made all reasonable endeavours to establish and assess a suitable grid connection route and PCC's for the Proposed Development. The indicative routes for these options are shown in Figures 3.11, 3.12 and 3.13, respectively. The applicant understands from publicly available information from ESB, that there is sufficient grid capacity at each of the substation outlined above to accommodate the Proposed Development.

Given the process and timelines for agreeing a grid connection with ESB, the proposed grid connection is excluded from the subject application for permission. Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority. To ensure the effects of the whole project are considered as part of this application, the EIAR assesses the 3 potential options.

Figure 3.11 Grid Route connection option to the Cloonanny Glebe substation

Figure 3.12 Grid Route connection option to the Richmond substation

Figure 3.13 Grid Route connection option to the Longford substation

3.2.4.3.3 On-Site Substation

Generally, on-site substations can be designed as modular or block stations. Modular stations provide several benefits such as a possibility of construction off-site which allows for a reduced construction scope on site, minimised risks of construction delays and site congestions and overall limited environmental impacts during construction while enhancing operational efficiency and streamlined maintenance and repair processes, ensuring smooth operation of the project and improving network reliability. Additionally, modular substations are engineered to occupy a reduced footprint while still meeting all technical requirements. For these reasons, a block substation was not considered appropriate, and the proposed on-site substation will be developed as a modular station.

3.2.4.3.4 Haul Route

To determine the optimal delivery method, different haul routes were studied. An evaluation of those considered factors as turbine component details, general construction-related traffic, the proximity of suitable ports to the site, and suitable locations for site access.

Several ports were initially considered as potential entry points for the project, including the Port of Galway, Sligo Port, Dublin Port, and Belview Port, primarily due to their proximity to the site. After consultation with the turbine supplier, Enercon, Belview Port emerged as the most suitable option. Key factors influencing this decision include Belview's direct access to the national road network, free from the congestion and traffic restrictions affecting other ports. Additionally, Belview is one of the closest Irish ports to mainland Europe, offering the most direct shipping route. With its proven expertise in handling turbine components, Belview was selected as the preferred port of entry.

3.2.4.3.5 Delivery Route

Upon delivery to Bellview Port, the turbine components will be delivered to the site via the following route which makes optimum use of the National Road network. Please refer to Ch 06 Material Assets Traffic & Transport for full details. The swept path assessment has informed the Turbine Delivery Route (TDR) (Figure 3.13), which is as follows:

- Starting at Belview Port;
- N29 (via Slieverue Roundabout and Luffany Roundabout) to the N25 Waterford City Bypass;
- N25 to N9;
- N9 National Road to M9 Motorway;
- M9 Motorway and Merge onto M7 Motorway;
- Continue on M7 Motorway to N7 National Road;
- N7 National Road and merge onto northbound M50 Motorway at Junction 9;
- At M50 junction 7 exit onto N4 National Road;
- N4 National Road to M4 Motorway;
- M4 Motorway to N4 National Road;
- Exit N4 National Road onto R194 Regional Road (at Leo Casey Roundabout);
- Turn left at Kiernans cross junction onto the L1011;
- Turn left onto L5046;
- Turn left onto L50462.

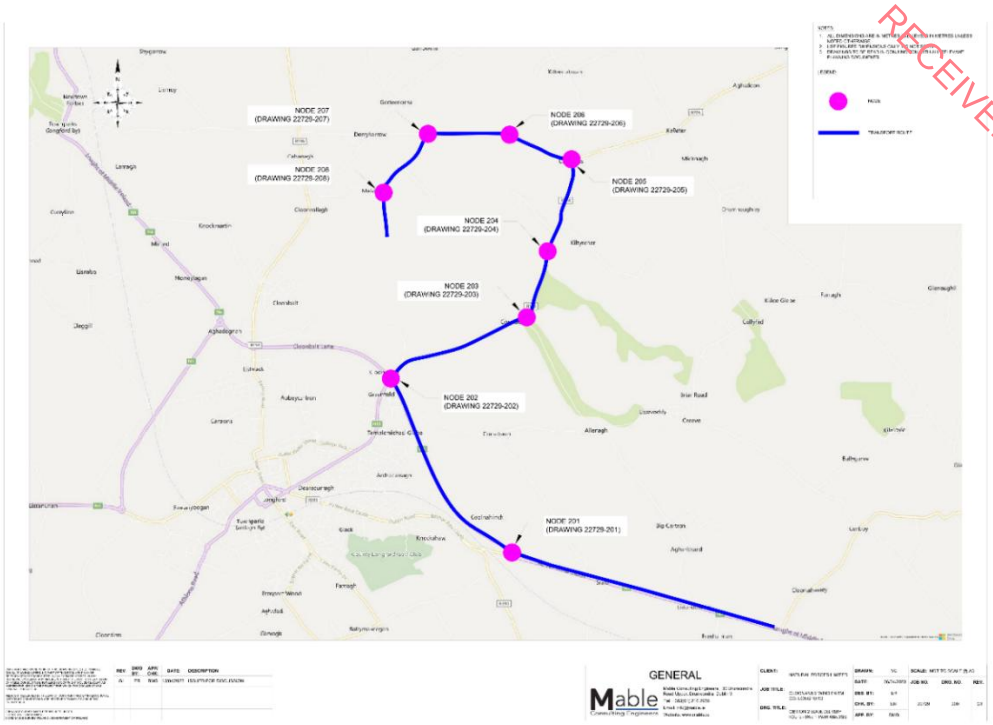

Figure 3.14 Final TDR

An alternative route was considered which can be seen in Figure 3.15 It was not chosen due to as significantly more temporary works to the road network and adjoining properties would be required.

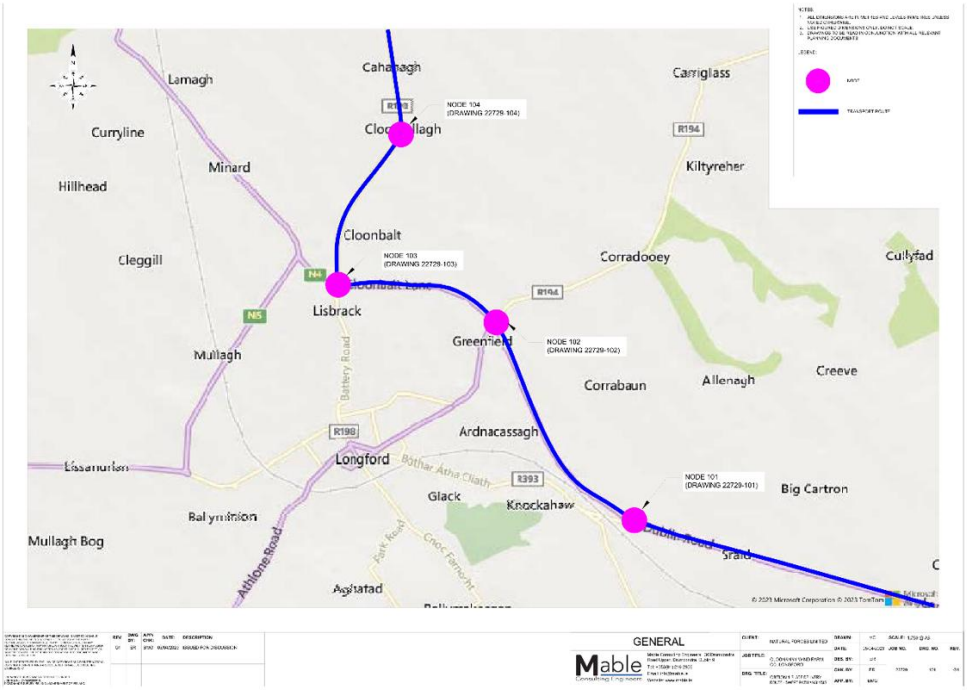

Figure 3.15 Alternative Option for TDR

3.2.5 Alternative Technical Solutions

3.2.5.1 Alternative Energy Technologies

Ireland heavily relies on fossil fuels such as gas, oil, coal, and peat for energy, leading to significant CO2 emissions that contribute to climate change and environmental issues. International, national, regional and local policies aim to promote renewable energy to reduce this dependency. The 2015 White Paper on 'Ireland's Transition to a Low Carbon Energy Future 2015 – 2030' sets ambitious goals to cut GHG emissions by 80% to 95% by 2050 and to zero or below by 2100. Utilising renewable resources like wind energy is crucial to achieving these targets. Therefore, only alternative renewable energy sources were considered.

Wind energy and solar energy are considered the only viable options for the Cloonanny site. The decision to choose wind over solar for this site was driven by three primary factors: land use efficiency, the ability to maintain existing agricultural practices and capacity factors. Given the increased land footprint and lower capacity factor associated with solar energy, and the ability to maintain agricultural practices with a turbine layout, wind energy is a more appropriate option for this site. It allows for more efficient land use while providing a higher yielding energy output, ensuring minimal disruption to current land use and supporting both renewable energy goals and local farming activities.

3.2.5.1.1 Land Use Efficiency

According to the Department of the Environment, Climate and Communications (DECC), approximately 1.5-2 hectares are required to support 1 MW of solar capacity. To match the current wind farm's generating capacity of 14 MW, a solar farm would need to cover approximately 21-28 hectares. In contrast, the two turbine foundations and associated hardstanding areas for the development occupy only 3.2 hectares, significantly less land. This difference in land footprint for equivalent energy generation makes solar energy less viable for the site. The substantial land requirement for solar development would have a greater impact on the local environment and could present challenges regarding land availability.

3.2.5.1.2 Agricultural Land Use

The site is currently used for agricultural purposes. The smaller land footprint required for wind energy means that existing farming practices can continue alongside the wind farm operations. Wind turbines occupy a small portion of the land, allowing for the coexistence of renewable energy production and agriculture. This dual use of the land maximises its utility and supports the local agricultural economy, making wind energy a more suitable choice for this site.

3.2.5.1.3 Capacity Factors

Another important consideration is the capacity factor, which measures the actual output of the wind farm expressed as a percentage of the maximum theoretical output. According to the DECC, wind energy has a capacity factor of 35%, more than three times that of solar energy, which has a capacity factor of 11%. As a result, wind energy utilises land more efficiently and generates more energy over time.

3.2.5.2 Alternative Turbine Model

The decision to select the Enercon E175 over alternative turbine models, such as the Enercon E138, was guided by several key factors. Firstly, the E175 offers a higher rated power capacity than the E138. Given that the E138 and E175 have similar footprints, choosing the E175 allows for maximised energy generation without requiring additional space for foundation bases, thereby achieving greater energy yield per turbine. This higher yield means that fewer turbines are needed to meet energy targets, resulting in a reduced overall environmental impact. Additionally, the E175's larger rotor diameter enhances its performance in low wind conditions, capturing more wind energy effectively. Moreover, the E175 incorporates advanced technology and design enhancements that contribute to enhanced reliability and reduced maintenance requirements, which are crucial for optimising operational efficiency and minimising downtime.

Collectively, these factors made the Enercon E175 the preferred choice for achieving optimal performance and economic viability at the selected wind farm site.

3.2.5.3 Turbine Features

Standard Wind Turbines can be fitted with several additional technical features if required by the developer. To further reduce effects on the environment, the proposed Turbines will be fitted with a Shadow shut-off system and trailing edge serration (TES).

3.2.5.3.1 Shadow Shut-off System

Shadow flickering is the recurrent shading of direct sunlight by the movement of the wind energy converter's rotor blades. The occurrence of this effect depends on current local weather conditions, alignment of the nacelle according to the wind direction, the position of the sun and the wind energy converter operating times.

Shadow shutdown is a function that is integrated into the control system of the wind energy converter. The shutdown times and parameters are determined and programmed into the wind energy converter control system. Shadow shutdown is activated as soon as the shutdown intensity falls below the set values.

Despite the current adherence to the thresholds outlined in the Wind Energy Development Guidelines for Planning Authorities 2006, a shadow shut-off system will be installed within both turbines before the project is commissioned to address any shadow flicker that may arise in the future. This approach ensures compliance with evolving regulatory standards and enhances the overall acceptability of the turbine within its operating environment. A technical description of the Shadow shut-off system is included in Appendix 2.3 to this EIAR.

3.2.5.3.2 Trailing Edge Serration (TES)

Different flow speeds will occur at the edges of the rotor blade. As a result, turbulences occur which can lead to rising noise levels when the wind energy converter is in operation.

To mitigate the noise levels associated with these aerodynamic characteristics of the rotor blades, TES will be incorporated into the turbine's design. The TES add-on consists of carefully designed serrated profile mounted on the trailing edge of the blade. The strategic placement of the feature disrupts and

controls airflow patterns, and subsequently minimised noise generation. A technical description of the TES is included in Appendix 2.1 to this EIAR

3.3 Difficulties Encountered

There were no difficulties encountered in the preparation of the alternatives assessment for the proposed development.

3.4 Conclusion

On the basis of the foregoing, it is considered that all reasonable alternatives to the project were considered, and no alternatives have been overlooked which would significantly reduce or further minimise environmental effects. This chapter provides a description of these reasonable alternatives and an indication of the main reasons for selecting the preferred option.

The aim of this process was to avoid potential likely significant negative impacts on the environment by selecting a site for the project with the least concerns about sensitive environmental impacts, fewer constraints suited to accommodate the project sustainably. Once the location as established, a number of alternative designs and layouts were prepared and assessed by the multidisciplinary design and EIAR team to resolve potential likely significant environmental effects through an investigation of local constraints and consultation feedback.

Ultimately, a combination of design and layout options has been selected that achieves the best balance between avoiding likely significant environmental effects and delivering a sustainable project, this chapter demonstrates that the proposed preferred alternative performs better than other alternatives considered.

CHAPTER 4
POPULATION & HUMAN HEALTH

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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4 Population & Human Health

4.1 Introduction

According to the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017), human health is; *"a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

The Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) advise that "*in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc.*"

This chapter addresses the likely significant environmental impacts of the proposed development on population and human health. It is noted that other chapters of the EIAR also deal with likely significant environmental effects on population and human health arising from Landscape & Visual (Chapter 5), Material Assets – Traffic & Transport (Chapter 6), Water & Hydrology (Chapter 9), Noise & Vibration (Chapter 12), Air Quality (Chapter 13) and Climate (Chapter 14), and the risk of major accidents and/or disasters and those chapters should be referenced in conjunction with this chapter of the EIAR.

4.2 Expertise and Qualifications

This chapter was prepared by Anika Haget of McCutcheon Halley Chartered Planning Consultants. Anika holds a BEng in Geoinformation and Municipal Engineering from Frankfurt University of Applied Sciences, a MSc in Urban Planning from HafenCity University Hamburg and has over 5 years of professional experience as a planning consultant in Germany and Ireland. She is a Graduate Member of the IPI and has contributed to EIA screening reports and EIAR's for a range of development types including infrastructure, commercial and residential projects.

4.3 Proposed Development

A brief summary of the development is outlined below. A detailed description of the proposed development is contained within Chapter 2 of this EIAR and the Planning Statement that accompanies the application. The statutory notices should also be referred to.

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

The grid connection from the proposed on-site substation to the national electricity grid does not form part of the subject planning application. However, as part of the planning application process, this EIAR addresses three potential grid connection options currently considered to ensure a comprehensive environmental assessment of all aspects of the Proposed Development. The grid connection will be via 1 of the 3 potential options outlined below:

- Option 1 Connect the proposed development via (8.03km) to Richmond 110kV Substation
- Option 2 Connect the proposed development via (3.96km) to Longford 38kV Substation

- Option 3 Connect the proposed development via (5.85km) to Glebe 38kV Substation

It is anticipated that the grid connection from the Proposed Development will be by means of an underground cable connecting to one of the Substations identified above via the public road network. For bridge crossings, the cable will be located within the bridge deck, where there is insufficient depth and width available horizontal directional drilling (HDD) will be employed as an alternative.

Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

All elements of the proposed development as outlined above together with the turbine delivery route and grid connection options have been assessed as part of this EIAR.

4.4 Methodology

4.4.1 Relevant Legislation & Guidance

This chapter has been prepared having regard to the legislation and guidance outlined in Chapter 1 of this EIAR. The impact assessment section follows the terminology (where applicable) used in the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022), as set out in **Chapter 1** of this EIAR.

Publications and other data sources consulted include:

- National Planning Framework, Ireland 2040 – Our Plan (2018);
- Draft First Revision to the National Planning Framework (July 2024);
- Wind Energy Development Guidelines (2006);
- Draft Revised Wind Energy Development Guidelines (December 2019);
- Eastern and Midlands Regional Spatial and Economic Strategy 2019-2031;
- Longford County Council Development Plan 2021-2027;
- County Longford Tourism Strategy 2023-2027;
- Ireland's Hidden Heartlands Regional Tourism Development Strategy 2023 – 2027;
- Central Statistics Office (CSO) website www.cso.ie; and
- Pobal website (https://maps.pobal.ie/);
- Health and Safety Authority website (https://hsa.ie);
- Tusla Child and Family Agency Website (https://www.tusla.ie/);
- OSI mapping and aerial photography.

Additionally, reports prepared by the Design Team, included in this application under separate cover were consulted:

- Planning Statement (McCutcheon Halley Chartered Planning Consultants);
- Appendix 1.3 Community Consultation Report (NFRE Ltd);
- Appendix 4.1 Shadow Flicker Assessment (WRD GmbH/Enercon GmbH).

This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

The impact assessment section of this chapter follows the terminology (where applicable) used in the EPA Guidelines as set out in **Chapter 1** of this EIAR.

4.4.2 Site Surveys/Investigations

To inform this assessment, the application area and surrounds were visited on several occasions in 2024. The purpose of the site walkover was to identify the characteristics of the subject land and surrounding area to appraise the likely and significant potential impact upon human receptors. Ordnance Survey maps and aerial photography were also examined to assist in this process.

4.4.3 Shadow Flicker Assessment

Like any solid or opaque objects, wind energy turbine cast shadows on the surrounding areas. The rotation of the blades generates an effect called shadow flicker by repeatedly cutting of the sun rays. The effect of shadow flickering on certain areas surrounding the proposed turbines depends on the position of the sun and the intensity of the sunbeams, the direction of the wind (i.e. position of nacelle) and the position of the turbine. Furthermore, shadow flicker can only be observed when the blades rotate.

A Shadow Flicker Assessment has been prepared for the proposed development to assess likely effects of shadow flicker on nearby properties within the vicinity of the proposed turbines. The Assessment can be found in Appendix 4.1 to this Chapter.

The Shadow Flicker Assessment has been carried out in accordance with the applicable Wind Energy Development Guidelines (2006). The 2006 Guidelines state that the likelihood of shadow flicker being experienced at distances greater than 10-times rotor diameter from a turbine is low. Besides the turbines, no other elements of the Proposed Development generate shadow flicker effects. Therefore, the study area has been determined as 1.75km from the proposed turbines and all dwellings within this area have been assessed for shadow flicker effects.

The WEG 2006 set out that the acceptable limit for shadow flicker is 30 hours per year with a maximum of 30 minutes per day for dwellings and offices within 500m from the proposed turbines.

4.4.4 Consultation

Pre-Planning Consultation was undertaken with Longford County Council on May 24th online.

The applicant invited the public to an open information day on October 9th close to Melview village. Details of the Proposed Development were displayed on the walls. Members of the Design,

Environmental and Ecology Teams were in attendance with the applicant to meet with visitors and discuss the project.

4.5 Difficulties Encountered

There were no difficulties encountered in compiling the information contained in this chapter.

4.6 Baseline Environment

4.6.1 Study Area

For the purpose of this assessment, the Study Area was chosen based on the designated Electoral Division (ED) Areas within 3km radius of the application site. There are no guidelines which stipulate the Zone of Influence of the study area. Professional judgement is used and the rationale for selecting this radius is based on the need to understand the capacity of the existing demographic and employment profile in the local area.

Therefore the study area comprises 8 no. EDs, namely Longford No 1 Urban ED, Longford No 2 Urban ED, Longford Rural ED, Clonee ED, Corboy ED, Drumlish ED, Breanrisk ED and Caldragh ED, as shown in Figure4.1 below. The study area includes all potential Grid Connection routes. It is largely rural but includes the settlements of Longford Town and Drumlish and the rural settlement clusters of Melview, Carriglass, Killashee, Cullyfad, Enybegs, Kilnatraun and Stonepark.

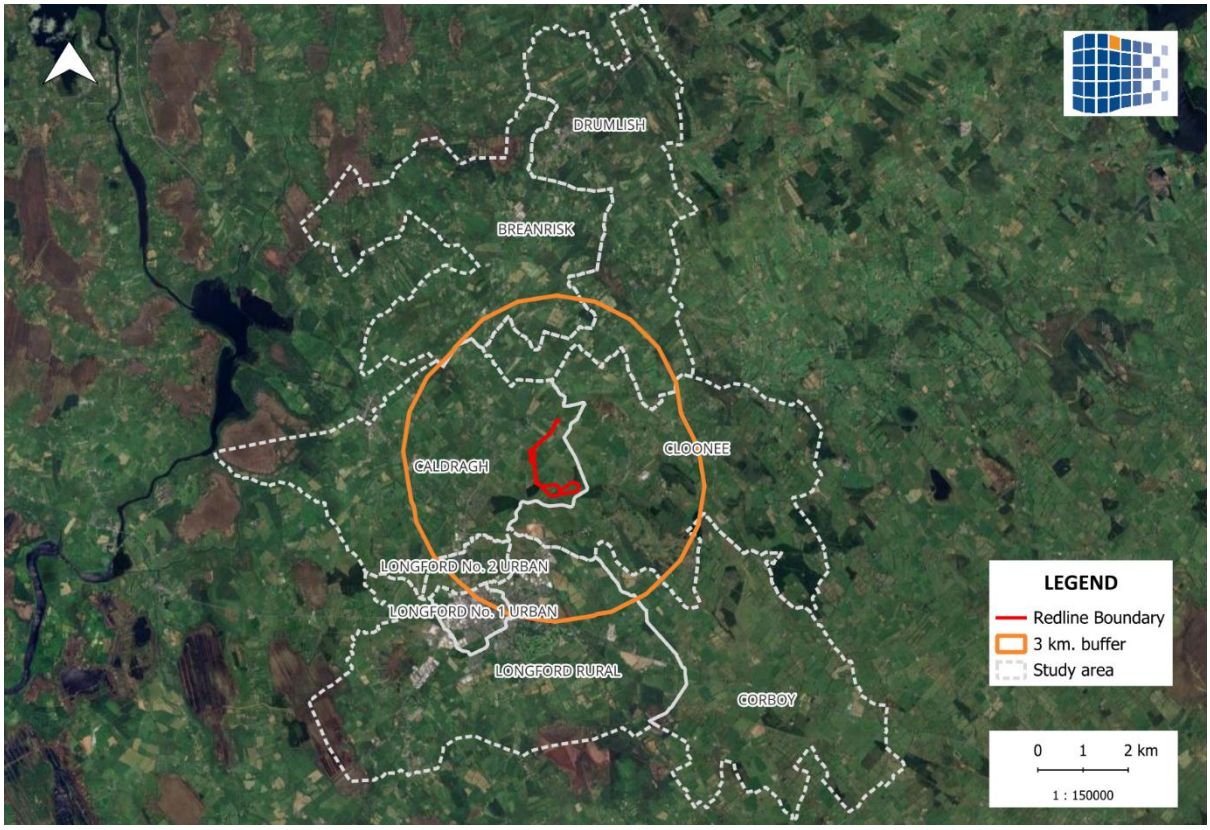

Figure 4.1 Study Area

4.6.2 Land Use

4.6.2.1 Site

The subject Site is located in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna Co. Longford, and can be described as L-shaped, measuring approx. 17.28 ha in area. It is made up of a number of private landholdings. Access to the site is available from the Local Road L5046 and L1011. The site's low-lying landscape consists of a rural road and agricultural pasture lands with higher ground to the north and east. The area is drained by several small ditches into the Camlin River to the south which flows in a general east-west direction to Lough Ree and ultimately to the Shannon further west.

Figure 4.2 Land Use at Subject Site

The landcover of the Proposed Development site is classified in Corine 2018 as 231 Agricultural Area – Pasture. The Corine land cover for the wind farm site is illustrated in Figure 4.3.

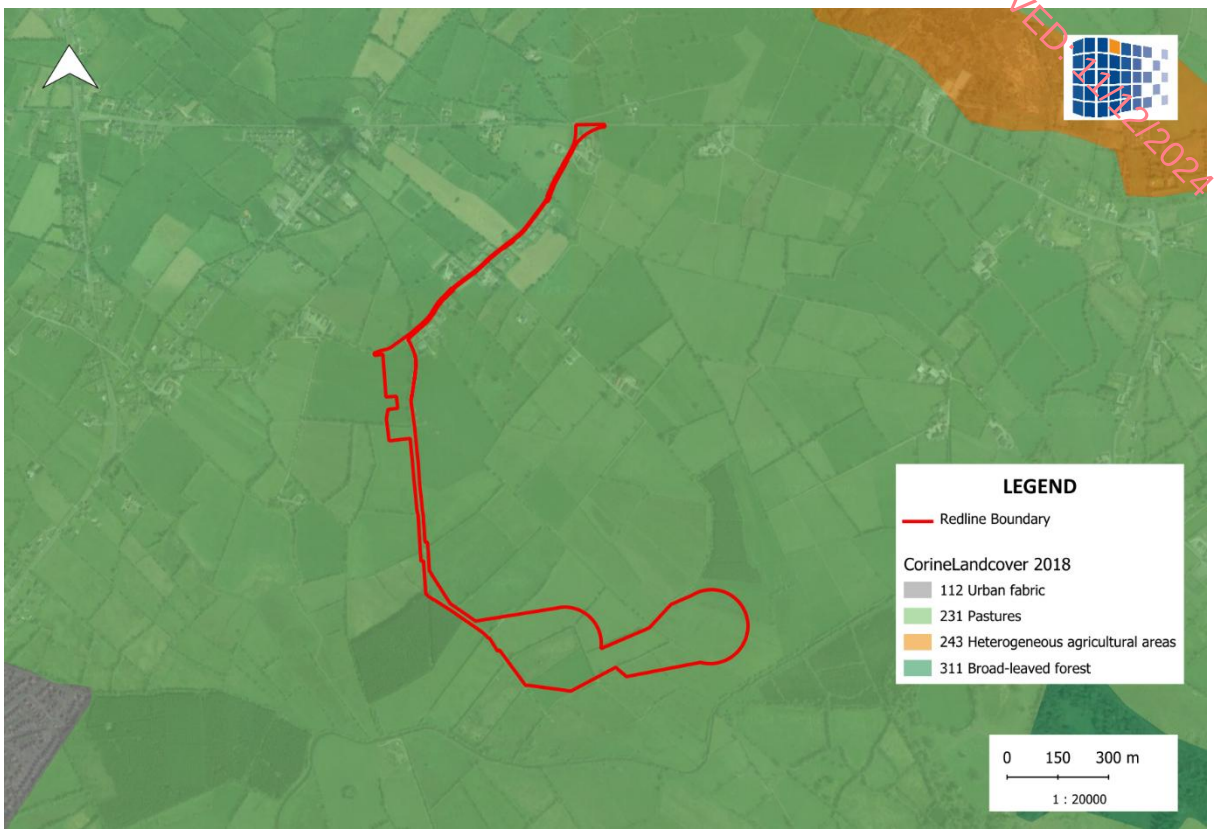

Figure 4.3 Corine Landcover 2018 at Subject Site

4.6.2.2 Study Area

Site context is described in detail in Chapter 1 of this EIAR. The following summary describes the existing and surrounding context relevant to this chapter.

The study area is mainly used for agriculture, with some residential and commercial areas.

The closest settlements to the proposed development are the rural settlement clusters of Melview, located c. 700m northwest of the site and Carriglass, c. 900m southeast of the site. Furthermore, the site is located c. 2.8km north-east of Longford Town and c.3.5km south-east of Newtown Forbes.

In Corine 2018 the landcover for the wider site is predominantly identified as 231 Agricultural Area – Pasture. Furthermore, the Study Area consists predominantly of the following landcovers:

- 111 and 112 Urban Fabric;
- 121 Industrial, commercial and transport units;
- 243 Heterogeneous agricultural areas;
- 142 Artificial non-agricultural vegetated areas (Sport and leisure facilities);
- 311 and 312 Forest and semi-natural areas;
- 412 Peat Bogs.

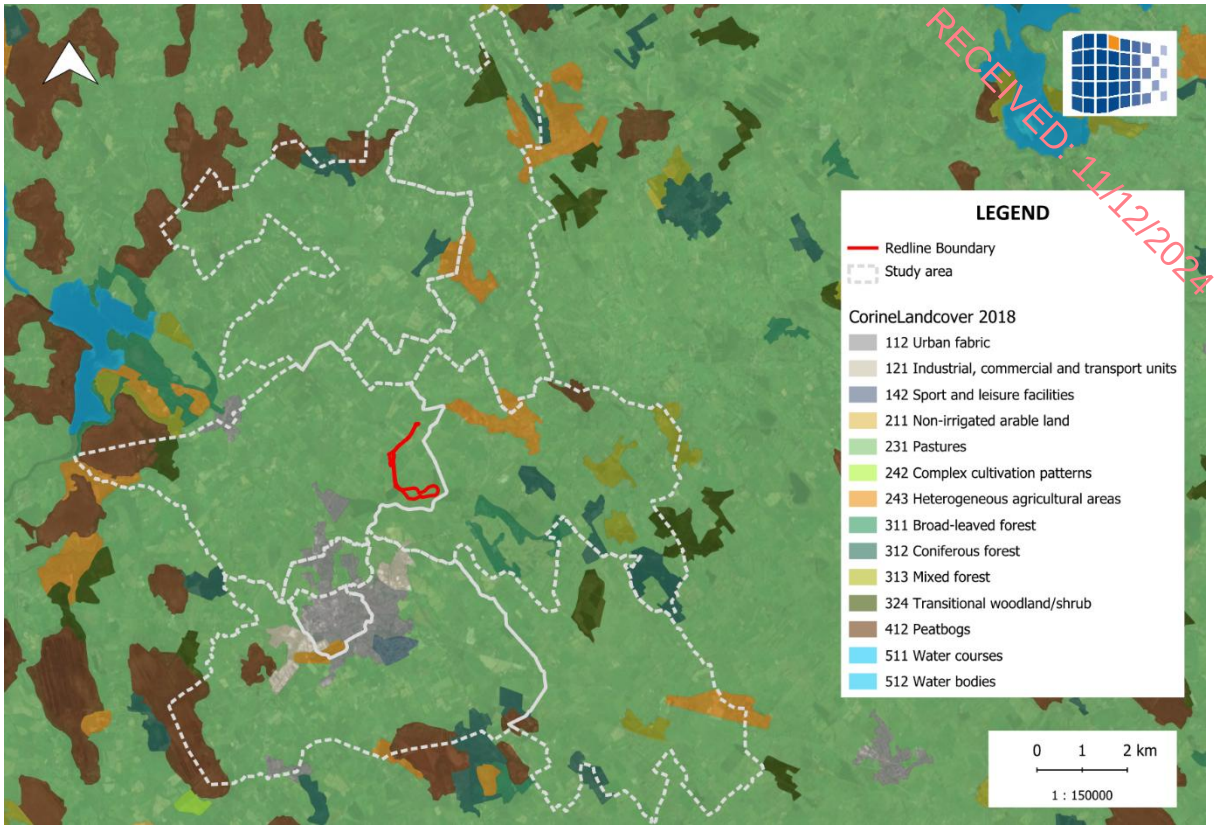

Figure 4.4 Corine Landcover Map for Study Area

4.6.2.3 Land Use Zoning

The subject site is located within the functional area of Longford County Council and is governed by the Longford County Development Plan 2021-2027 (LCDP).

The application site is categorized as 'Rural' (Open Countryside) in the LCDP. Under the Plan, there are no land use zoning objectives in place for the lands.

The Plan recognises that rural areas are an important resource within the County with significant potential to be harnessed for renewable energy projects, including wind, in both the narrative and associated policy objectives.

4.6.3 Population and Demographic Profile

This section reviews the demographic characteristics, population, and age structure of the study area. According to Census 2022 results, the study area population is 17,308 no. people, see Table 4.1 below. This represents an 8.6% increase in population in the period between 2016 and 2022; this is slightly higher than the growth rate for the Country (8.1%). but lower than the population increase in Longford County in the same period (14.4%).

Of the Study Area population, c. 30% (5,163 persons) live within the Urban ED's of Longford Town.

Table 4.1 Population 2011-2022 with % change (Source: CSO)

Census	2011	2016	2022	16-22 % increase
Ireland	4,588,252	4,761,865	5,149,139	8.10%
County Longford	39,000	40,873	46,751	14.40%
Study Area	14,988	15,937	17,308	8.60%
Cloonee ED	727	738	767	3.90%
Drumlish ED	1,387	1,475	1,682	14.03%
Caldragh ED	2,061	2,172	2,690	23.80%
Longford No 2 Urban ED	943	1,029	1,120	8.80%
Longford No 1 Urban ED	3,163	3,592	4,043	12.60%
Corboy ED	399	388	420	8.20%
Longford Rural ED	5,492	5,704	5,685	-0.30%
Breanrisk ED	816	839	901	7.39%

The age profile of the population within the Study Area is an important parameter as it provides a good insight into the potential labour force, amenities and other facilities and future housing demand.

Regarding the Census 2022, there were 5,563 people aged 50+ (32.1%) in the Study Area, which is equal the rate in County Longford (33.4%). Older people in the Study Area (aged 65+) totalled 2,615 persons (15.1%), which is consistent with County Longford (15.6%).

The average age of those residing in the Study Area was 38.35 years, slightly lower than County Longford and the State with an average age of 38.8 years each in 2022.

Table 4.2 Population by Age Cohort (Source: CSO 2022)

Age Cohorts	County Longford		Study Area	
	Population	Percentage	Population	Percentage
0-4 years	2,695	5.80%	1,043	6.03%
5-9 years	3,353	7.20%	1,317	7.60%
10-14 years	3,680	7.90%	1,419	8.20%
15-19 years	3,226	6.90%	1,188	6.90%
20-24 years	2,528	5.40%	900	5.20%
25-29 years	2,293	4.90%	930	5.40%
30-34 years	2,749	5.90%	1,054	6.09%
35-39 years	3,347	7.20%	1,254	7.30%
40-44 years	3,822	8.20%	1,412	8.20%
45-49 years	3,418	7.30%	1,228	7%
50-54 years	3,105	6.60%	1,106	6.40%
55-59 years	2,743	5.90%	972	5.60%
60-64 years	2,460	5.30%	870	5%
65-69 years	2,235	4.80%	731	4.20%
70-74 years	1,988	4.30%	716	4.10%

75-79 years	1,495	3.20%	550	3.20%
80-84 years	833	1.80%	310	1.80%
85+ years	781	1.70%	308	1.80%
Total	**46,751**	**100%**	**17,308**	**100%**

The State average household size in 2022 was 2.74. The average household size in County Longford is slightly lower (2.71) while the study area is consistent with the State (2.74).

Table 4.3 Households (Source: CSO 2022)

Study Area	Total Population	Total Households	Average Household Sizes
Ireland	5,046,681	1,841,152	2.74
County Longford	43,920	16,229	2.71
Study Area	17,308	6,325	2.74

4.6.4 Economic Status

63% of the population within the Study Area are within the working age cohort between 15 and 64 years. Overall, 50% of the population in the study area are at work which is 6% below the national average and 3% below the county average. The table below shows the economic activity of the residential population in the study area, compared to the county and the state average.

Table 4.4 Principal Economic Status (Source: CSO)

Economic Status	Study Area	%	County Longford	%	State	%
At work	6,782	50.10%	19,695	53.20%	2,320,297	56.10%
Looking for first regular job	227	1.70%	441	1.20%	34,526	0.80%
Short term unemployed	339	2.50%	758	2%	70,217	1.70%
Long term unemployed	554	4.10%	1,168	3.20%	106,059	2.60%
Student	1,342	9.90%	3,837	10.40%	459,275	11.10%
Looking after home/family	1,012	8%	2,684	7.20%	272,318	6.60%
Retired	2,170	16.00%	5,953	16.10%	657,790	15.90%
Unable to work due to permanent sickness or disability	945	7.00%	2,147	5.80%	189,308	4.60%
Other	158	1.20%	340	0.90%	27,062	0.70%
Total	**13,529**	**100%**	**37,023**	**100%**	**4,136,852**	**100%**

Census 2022 also indicates data for persons at work or unemployed by occupation (see Table 4.5 below). The data reveals the main occupations in the Study Area were Professional Occupations (13.5%) followed by Skilled Trades Occupations (11.9%), and Elementary Occupations (10.4%). Within County Longford, Skilled Trades Occupations and Professional Occupations were also the main occupation types.

Table 4.5 Occupation in Study Area and County Longford (Source: CSO 2022)

Occupations	Study Area	%	County Longford	%
Managers, Directors and Senior Officials	457	6.00%	1,266	5.90%
Professional Occupations	1,033	13.50%	3,027	14.00%
Associate Professional and Technical Occupations	591	7.70%	1,709	7.90%
Administrative and Secretarial Occupations	592	7.70%	1,729	8.00%
Skilled Trades Occupations	917	11.90%	3,190	14.80%
Caring, Leisure and Other Service Occupations	666	8.70%	1,756	8.10%
Sales and Customer Service Occupations	486	6.30%	1,130	5.20%
Process, Plant and Machine Operatives	758	9.90%	1,935	8.90%
Elementary Occupations	791	10.30%	1,782	8.20%
Not stated	1,384	18.00%	4,097	18.90%
Total	**7,675**	**100.00%**	**21,621**	**100.00%**

A breakdown of CSO data for persons at work by industry is provided in the Table 4.6 below. The largest proportion of persons at work in the Study Area are employed in 'professional services' (22.1%), followed by 'manufacturing industries' (19%) and 'commerce and trade' (18.5%). The largest proportion of the County is 'Professional service' (21.5%) followed by 'commerce and trade' (17.2%) and 'manufacturing industries' (16.4%).

It is noted, that despite the rural setting of the subject site and Study Area with the landcover being predominantly related to agriculture, only 2.5% of the workforce in the study area work in the agriculture, forestry and fishing industry which is below the County share of 5.4%.

Table 4.6 Persons at work by industry in Study Area and County Longford (Source: CSO 2022)

Industry	Study Area	%	County Longford	%
Agriculture, forestry and fishing	168	2.48%	1,066	5.41%
Building and construction	366	5.40%	1,196	6.07%
Manufacturing industries	1295	19.09%	3,225	16.37%
Commerce and trade	1256	18.52%	3,389	17.21%
Transport and communications	363	5.35%	976	4.96%
Public administration	430	6.34%	1,295	6.58%
Professional services	1,501	22.13%	4,241	21.53%
Other	1,403	20.69%	4,307	21.87%
Total	**6,782**	**100%**	**19695**	**100%**

The level of educational attainment for the study area population and the County is shown in the Table 4.7 below**.** Of all persons aged 15 years and over within the study area 14.2% had completed lower secondary and 19.5% had completed upper secondary school. A further 28.5% in the Study Area have attained a tertiary-level qualification, which equals the County level (28.7%).

Table 4.7 Education Status (Aged 15+) in Study Area & County Longford (Source: CSO, 2022)

Education Level (Aged 15+)	Study Area	%	County Longford	%
No formal education	429	4.00%	1076	3.50%
Primary education	979	9.10%	2686	8.90%
Lower secondary	1,532	14.20%	4331	14.30%
Upper secondary	2,101	19.50%	5569	18.40%
Technical or vocational qualification	1,081	10.00%	2662	8.80%
Advanced certificate/Completed apprenticeship	561	5.20%	1705	5.60%
Higher certificate	651	6.10%	1758	5.80%
Ordinary bachelor degree or national diploma	716	6.70%	2018	6.70%
Honours bachelor degree, professional qualification or both	991	9.20%	2809	9.30%
Postgraduate diploma or degree	647	6.00%	1934	6.40%
Doctorate(Ph.D) or higher	59	0.50%	137	0.50%
Not stated	1,011	9.40%	3645	12.00%
Total	**10,758**	**100%**	**30,330**	**100%**

4.6.4.1 Deprivation Index

The Pobal Deprivation Index is Ireland's most widely used social gradient metric, which scores areas in terms of affluence or disadvantage. The index uses information from Ireland's census, such as employment, age profile and educational attainment, to calculate this score. The map below shows the level of affluence and deprivation at the Small Area level, according to the Pobal HP Relative Deprivation Index. Scores range from -35 (Extremely Disadvantaged) to +35 (Extremely Affluent). The overall score for Longford County in 2022 was calculated as -5.33, which is described as *Marginally Below Average* and has slightly improved from -6.01 in 2016. The 2022 deprivation index in the Study Area varies between 2.04 for Clonee ED and -19.36 for Longford No 1 Urban.

Table 4.8 Pobal HP Deprivation Index 2016 and 2022 (Source: Pobal HB)

	Deprivation Index 2016	Deprivation Index 2022
County Longford	-6.01	-5.33
Study Area Average	-4.22	-4.63
Cloonee ED	-0.47	2.04
Drumlish ED	-4.82	-4.16
Caldragh ED	2.87	0.11
Longford No 2 Urban ED	3.83	0.05
Longford No 1 Urban ED	-15.82	-19.36
Corboy ED	-4.38	-1.89
Longford Rural ED	-9.97	-10.10
Breanrisk ED	-4.97	-3.76

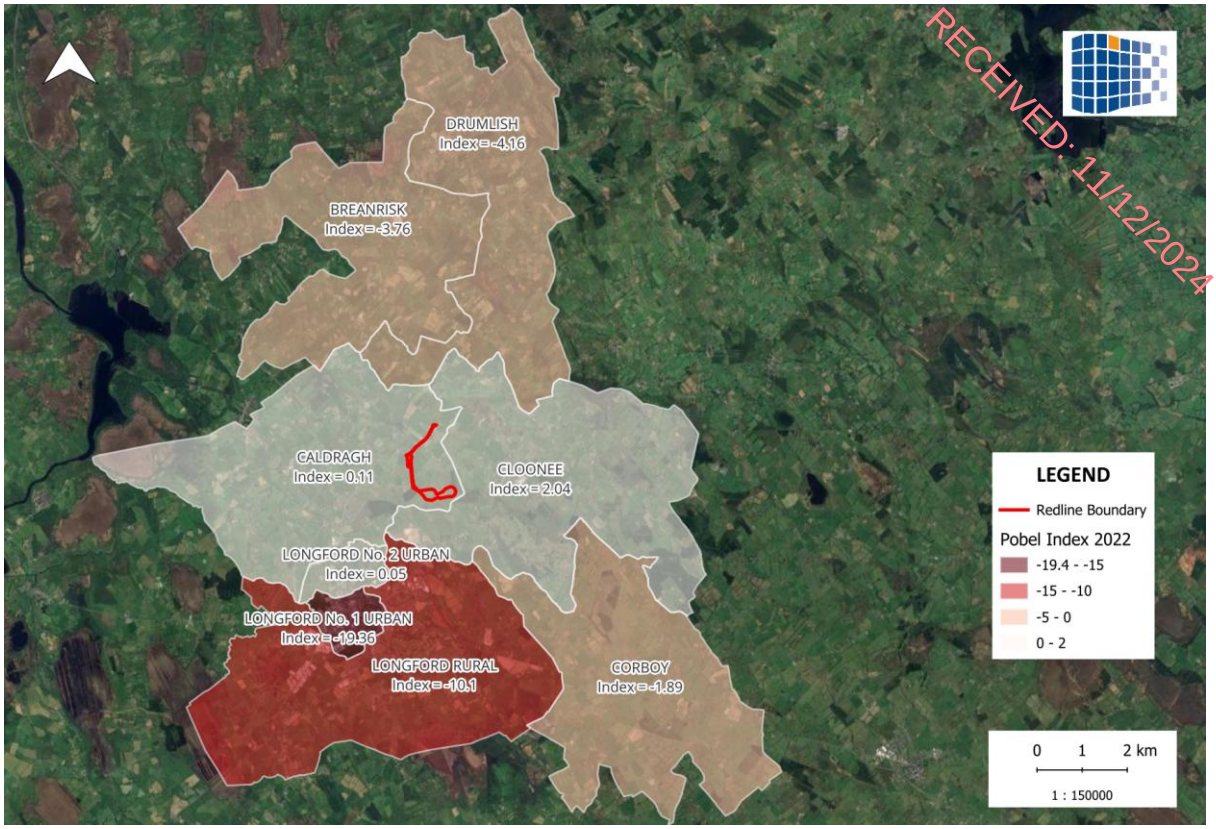

Figure 4.5 Pobal HP Deprivation Indices 2022 in the Study Area by Electoral Division

4.6.5 Residential Amenity

Residential Amenity refers to the quality of the environment surrounding residential properties. As noted in previous sections, the main land use on and surrounding the subject site is agriculture, with some residential and commercial areas in the wider environs of the subject site. The location of the proposed turbines in relation to the nearest residential Eircode is T1: 803.43m away, T2: 800.32m away.

Figure 4.6 Geographical Area for Engagement (1.75km buffer)

A total of 184 residential dwellings were engaged by the applicant during the design stage of the Proposed Development, for details please refer to Appendix 1.3 *Community Consultation Report* of this EIAR. Engagement included door visits to immediate neighbouring dwellings, leaflet distribution to local residents and an open information session for residents living in close proximity to the site.

4.6.6 Tourism

Tourism is a significant component of the Irish Economy. The CSO has estimated that in 2019, tourism contributed €13.5 billion to the Irish economy and that there were 284,800 full-time equivalent jobs directly involved in tourism in Ireland (CSO 2023).

Fáilte Ireland, as the National Tourism Development Authority, is responsible to support the long-term sustainable growth in the economic, social, cultural and environmental contribution of tourism to Ireland. It therefore develops Regional Tourism Development Strategies for four distinct experience propositions. County Longford is located within the regional experience brand '*Ireland's Hidden Heartlands*'.

Chapter 10 *Tourism* of the Longford County Development Plan states that historically, Fáilte Ireland and CSO visitor research has identified that County Longford has not experienced a growth in visitor numbers commensurate to other parts of Ireland. Before the introduction of Failte Irelands fourth regional experience brand '*Ireland's Hidden Heartlands'* in 2018, overseas visitor figures from 2017 show that Longford was the least visited county in Ireland with the least revenue relating to tourism.

Since the introduction of '*Ireland's Hidden Heartlands*' in 2018 and the opening of *Longford Forest Center Parcs* in July 2019 the County has seen an upscaling of the tourism sector.

There are no key identified tourist attractions pertaining specifically to the Proposed Development site. A limited number of tourism activities in the study area and surrounding lands, however, the site and its environs are not a key area for tourism. Given the significance of *Longford Forest Center Parcs* to the Tourism economy in Longford, this facility has also been considered although located outside the study area at a significant distance of c. 20km from the proposed development. According to the Longford Tourism Strategy, the resort employs over 1,200 employees and is currently attracting over 3,500 visitors to County Longford weekly. The Tourism Attractions listed in Table 4.9 below a are considered collectively as a sensitive receptor.

Table 4.9 Tourism Attractions in the Study Area

Attraction	Description	Distance
Longford Town		c. 3 km
St. Mel's Cathedral	Built between 1840 and 1856 and located in the centre of Longford town. The cathedral is the main historical attraction of the town overlooking all roads leading into Longford. On Christmas Day 2009, the Cathedral was destroyed by a fire and re-opened after restoration in December 2014.	c. 3 km
Dead of Night Festival	Annual Samhain celebration in Longford Town	c. 3 km
Royal Canal Greenway (including National Famine Way)	Constructed between 1790 and 1817, the historic Royal Canal was an important freight and passenger route in the 1800s. The 146 km long canal between Dublin and the River Shannon re-opened for navigation in 2010, and is now a popular destination for boaters, walkers, anglers and cyclists. The National Famine Way follows the same route as the Royal Canal Greenway is a self-guided Trail detailing the journey of famine emigrants who walked to ships in Dublin, at the height of the Irish Famine.	Closest distance c. 3.5 km
Corn Hill (also Cairn Hill) and Walking Trails	At 278m, Corn Hill stands alone as the highest point in Co. Longford, with walking trails offering panoramic views of the surrounding area. There is a telecommunications mast on the hill.	c. 7 km
The Marquee in Drumlish Festival	Annual Music Festival in Drumlish	c. 7.5 km
Center Parcs – Longford Forest	159ha family holiday resort in Newcastle Wood, offering a wide range of accommodation options and family friendly activities including Ireland's largest indoor water park.	c. 20 km

4.6.6.1 Tourist Attitudes to Wind Farms

In 2007 Fáilte Ireland in association with the Northern Ireland Tourist Board undertook significant research on visitor attitudes to wind farms in Ireland which was updated in 2012. The research found that in 2007 the majority of visitors felt that wind farms had either no impact (49%) or a positive impact (32%) on the landscape, whilst 17% felt it had a negative impact whereas the 2012 results indicated an increase in the polarisation of opinion – with increased positive (47%) and negative responses (30%) and less neutral responses (23%).

The study found also that the most widely held view is that the development of more windfarms will not impact the likelihood of visitors to visit Ireland again, with a slightly greater majority saying that this would have a positive rather than a negative impact. However, according to the study, the challenge lies in striking a balance between the maintenance of landscape character and scenery as a tourism asset, which has been assessed in Chapter 5 Landscape and Visual Assessment of this EIAR.

The article *'The impacts of onshore-windfarms on a UK rural tourism landscape: objective evidence, local opposition, and national politics'* (2020) by Tom Morduea, Dr Oliver Mossb and Dr Lorraine Johnston of the Newcastle Business School and Teesside University in the UK examines the impacts of onshore windfarms on rural tourism in the UK, focusing on Northumberland. The research investigates local opposition to windfarms, tourism impacts, and the broader political context around wind energy.

In relation to Impacts on Tourism, the study found no clear evidence that windfarms significantly affect tourism economies in rural areas. While local tourism businesses and some residents believe windfarms harm visitor numbers and experiences, survey data indicated that visitor numbers and tourism-related employment continued to grow in Northumberland, despite ongoing windfarm development.

4.6.7 Amenities and Community Facilities

Most of the amenities and community facilities, including Community Centres, GAA, rugby, other recreational and religious facilities are available in the nearby settlements of Longford town and rural settlements in the vicinity, catering for all age groups and interest. As highlighted in Section 4.6.5.3, a number of options for walking and cycling are available within the study area and surrounding lands, including the Royal Canal Greenway and Corn Hill Walking Trails.

Table 4.10 Amenities and Community Facilities in the Study Area

Facility	Category	Distance
Melview National School	Educational	c. 500 m
Kingdom Hall of Jehovah's Witnesses	Religious	c. 600 m
Longford Community Resources CLG	Community Centre	c. 2.2 km
Templemichael College	Educational	c. 2.2 km
Ardnacassa Community House	Community Centre	c. 2.5 km
St. John's National School	Educational	c. 2.6 km
St. Mel's College Secondary School	Educational	c. 2.6 km
St John's Church of Ireland	Religious	c. 2.7 km
St. Christopher's Special School	Educational	c. 2.7 km
Pitch & Pulse Music and Drama School	Educational	c. 2.7 km
Longford College of Further Education	Educational	c. 2.7 km
Longford GAA Club	Recreational	c. 2.7 km
Albert Reynolds Peace Park	Recreational	c. 2.7 km
St Michaels Boys National School	Educational	c. 2.8 km
Hope Community Church	Religious	c. 2.8 km
St Mel's Cathedral	Religious	c. 3 km
Killoe GAA Club	Recreational	c. 3 km

Facility	Category	Distance
Longford Baptist Church	Religious	c. 3 km
Meán Scoil Mhuire	Educational	c. 3.2 km
Longford Rugby Club	Recreational	c. 3.2 km
Harmony House Community Centre	Community Centre	c. 3.4 km
Longford Skate Park	Recreational	c. 3.4 km
Clonnguish GAA Club	Recreational	c. 3.5 km
The Church Of Pentecost-Ireland	Religious	c. 3.6 km
Cullyfad Community Centre	Community Centre	c. 3.5 km
Saint Oliver Plunkett Church and Cemetery	Religious	c. 3.5 km
Ennybegs Community Centre	Community Centre	c. 4 km
County Longford Golf Club	Recreational	c. 4.2 km
Longford Slashers GAA Club	Recreational	c. 5 km
RCCG Chapel of Light	Religious	c. 5 km
Longford Seventh-day Adventist Church	Religious	c. 5.1 km
Ballymacormack Graveyard	Religious	c. 5.8 km
St Marys Mixed National School	Educational	c. 6 km
Drumlish Community Centre	Community Centre	c. 6 km
Saint Mary's Roman Catholic Church and Ennybegs Cemetery	Religious	c. 6.1 km
Stonepark national School	Educational	c. 6.9 km
Corboy Presbyterian Church	Religious	c. 7.4 km

4.6.8 Human Health

The consideration of potential impacts on human health by the Proposed Development is examined separately in Chapters 5 – 15 of this EIAR. Where relevant, each of these chapters identify the sensitive receptors of greatest interest to their respective topics.

Ireland has a relatively low probability of experiencing severe natural disasters due to its geographic location, climate, and geological stability. Therefore, the likelihood of major natural disasters occurring at the project site impacting on Human Health is considered low.

From a safety perspective, turbines pose no threat to the health and safety of the general public. The 'Wind Energy Development Guidelines for Planning Authorities 2006' and the 'Draft Revised Wind Energy Development Guidelines 2019' iterate that there are no specific safety considerations in relation to the operation of wind turbines.

4.6.9 Shadow Flicker

The receiving baseline environment is a rural landscape, characterised by one-off dwellings and agricultural buildings.

The shadow flicker analysis assessed 403 receptors which represents any dwelling within 10 times rotor diameter of a turbine , as set out in the WEDG 2006. The study area includes dwellings in the

settlement clusters of Melview and Carrickglass as well as Clonbalt Wood Estate. All Shadow Receptors considered are listed in Appendix 4.1 to this chapter.

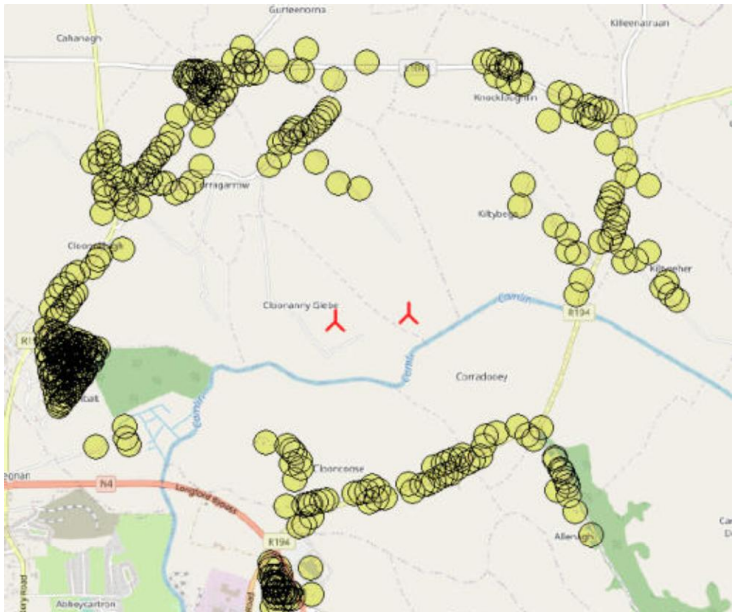

Figure 4.7 Shadow Receptors within 1.75km of the proposed turbines

4.7 Do Nothing Scenario

If the Proposed Development was not constructed, the Site and the current land-use of agriculture and public roads will remain unchanged to the current baseline conditions

If the Proposed Development were not to proceed, the potential benefits of local employment, community benefit and economic investment from the Proposed Development and its construction would be lost.

Furthermore, it would be a missed opportunity to contribute to County Longford's valuable renewable energy transition, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. Therefore, also health advantages of transitioning from fossil fuels to renewable wind energy will be lost.

4.8 Potential Significant Effects

This section describes the environmental effects that are likely to arise during the construction and operation of the proposed development. Section 4.9 sets out the mitigation measures required to alleviate identified effects. Section 4.10 presents the residual impact, which is an assessment of impacts post mitigation.

Potential Impacts are considered under the following headings:

- Population;
- Employment and Economic Activity;

- Residential Amenity;
- Human Health & Safety;
- Tourism;
- Shadow Flicker.

Specific effects with respect to matters such as air quality, noise, traffic, visual impact etc. are dealt with in the respective assessments in this EIAR.

4.8.1 Demolition and Construction Phase

4.8.1.1 Population

It is estimated that during peak construction, there is expected to be a peak on-site workforce of c. 25 workers. It is not anticipated that this will generate an increase in population locally as employees will travel to the Proposed Development site from their existing place of residence. Therefore, the construction phase will have no impact on the population in the study area in terms of changes to population trends or density, household size or age structure and the impact on the population is thus **neutral and not significant**.

4.8.1.2 Employment and Economic Activity

A vital characteristic of the Proposed Development in terms of its potential economic impact relates to its capital value, of which a significant portion will be for the purchase of Irish sourced goods and services. The construction phase (approx. 24 months) will provide a boost for the local construction sector in terms of employment generation (a peak on-site workforce of c. 25 workers), capital spend on materials and construction labour costs, and it will generate additional spending on the local economy, e.g. local shops and other local retail services and as a consequence of the presence of construction staff during the construction phase.

The staff will comprise of managerial, technical, skilled and unskilled workers and as far as practicable, local labour will be employed. In addition to direct employment, there will be considerable, wide ranging, off-site employment and economic activity associated with the construction of the Proposed Development. This is likely to include, but not limited to:

- supply of construction materials;
- financial, and legal services;
- engineering services;
- haulage and transport services, including vehicle servicing;
- traffic management;
- plant and equipment hire;
- waste management;
- landscaping and fencing;
- catering and accommodation for workers;
- security management;
- signage and lighting and telecommunications services.

The appointed contractors will be encouraged to develop local supply chains and work with local subcontractors and service providers

The overall predicted impacts associated with the construction phase on the working population and local economy are **likely** and will have a **moderate positive, temporary/short-term** effect.

4.8.1.3 Residential Amenity

The anticipated likely significant effects in the absence of mitigation on residential amenities relate to disruption due to increased construction traffic movements on the local road network, noise, dust and visual impact arising from plants (e.g. cranes) necessary to deliver the Proposed Development.

In the absence of mitigation, the anticipated impact on residential amenity would be **local** and of **temporary to short-term** duration with a **moderate** significance.

Specific potential for effects on residential amenities during the construction phase is dealt with in this EIAR under the more specific topics of the environmental media by which they might be caused including air, traffic and noise.

4.8.1.4 Human Health & Safety

Construction sites pose potential risks to the health and safety of the public. However, access by the public would be considered trespassing. In the absence of mitigation, the effect would likely be **negative,** with an effect that might range from **slight to profound** depending on the magnitude of the incident.

In the absence of standard construction mitigation measures, likely significant impacts would arise from construction traffic, noise, dust, and visual effects. It is noted that the potential for effects on population and human health during the construction phase are dealt with in this EIAR under the more specific topics of the environmental media by which they might be caused including landscape and visual, air quality, traffic and noise.

4.8.1.5 Tourism

The construction period is anticipated to last for 24 months and as identified in section 4.8.2.2, is likely to benefit the local economy through expenditure on purchases of accommodation, food, fuel etc. which will be required to sustain the construction workforce. It is considered that beneficial effects would be experienced by businesses operating within the tourism sector or service providers closely related to tourism. The effects would likely be **slightly positive** with a **temporary to short term** duration.

Given that there are currently no tourism attractions specifically pertaining to the site and given the distance of the Proposed Development to tourism attractions in the wider area, there are no effects on tourism attractions associated with the construction phase of the development.

4.8.1.6 Shadow Flicker

The Proposed Development, including the turbines will not be operational during the construction phase, therefore shadow flicker will not occur.

4.8.2 Operational Phase

4.8.2.1 Population

Given the nature of the Proposed Development there will be no impact on the population in the study area during the operational phase and the impact is thus **neutral and not significant**.

4.8.2.2 Employment and Economic Activity

During the operational phase the Proposed Development will require maintenance. There is an opportunity for mechanical-electrical contractors and craftspeople to become involved with the maintenance of the Proposed Development and the impact is thus **slight positive** on the **long term**.

4.8.2.3 Residential Amenity

The main impacts on residential amenity are Noise, Visual Impacts and Shadow Flicker. Detailed Noise modelling has been completed and the Visual impacts have been assessed with aid of verified Photomontages and a Landscape and Visual Impact Assessment in the respective chapters of this EIAR. Shadow Flicker Modelling has also been carried out and the results are considered in subsequent sections of this Chapter.

The developer will implement a community benefit fund for the Proposed Development which can be used by the local community to invest in and support the wider economic, recreational, environmental, social and cultural amenities and initiatives in the locality of the Proposed Development, the impact is considered **moderate, positive** on a **long term**.

4.8.2.4 Human Health & Safety

The potential for effects on human health during the operational phase is also dealt with in this EIAR under the more specific topics by which they might be caused including air, traffic, water and noise.

4.8.2.5 Tourism

Given that there are currently no tourism attractions specifically pertaining to the site and given the distance of the Proposed Development to tourism attractions in the wider area, it is not considered that the proposed development would have an adverse impact on tourism infrastructure in the vicinity.

Research has also found that it is unlikely that windfarms significantly affect tourism economies in rural settings such as the subject site.

No significant impact on tourism associated with the Operational Phase is identified.

4.8.2.6 Shadow Flicker

The modelled 'worst case' results of the shadow flicker assessment showed 26 No. shadow flicker receptors exceeding the 30 minutes per day or 30 hours per year standard, as set out in the Wind Energy Development Guidelines for Planning Authorities 2006.

The results indicated that shadow flicker may be experienced at receptive locations as indicated in the Table 4.11 below. However, these sensitive receptors are located greater than 500 metres from the

proposed turbine locations, aligning with the Wind Energy Development Guidelines for Planning Authorities 2006. The nearest dwelling is located 800m meters from the nearest proposed turbine.

Compared to the worst-case results, the 'real case' results are a more realistic prediction of likely shadow flicker, taking into account probability of sunshine and predominant wind direction based on historic meteorological data. None of the 403 no. receptors surveyed is likely to experience shadow flicker in excess of 30-hours per annum. Receptor JD emerged with the highest estimated duration of real case shadow flicker, anticipated at 7 hours and 22 minutes annually, the closest turbine to the respective receptor is T2 at a distance of 930m.

Based on the results of the shadow flicker assessment, the effect is **imperceptible, negative** and **long term.**

Table 4.11 Results of the shadow calculation – worst case (yearly and daily) and real case

Receptor ID	Worst Case Demand (hours / year)	Worst Case Total Shadow Flickering (hours / year)	Worst Case Demand (hours / day)	Worst Case Total Shadow Flickering (hours / day)	Real Case Total Shadow Flickering (hours / year)
CW	30:00	22:38	00:30	0:31	03:47
CZ	30:00	33:03	00:30	0:33	05:54
HX	30:00	21:28	00:30	0:39	03:41
IE	30:00	19:44	00:30	0:39	03:15
IM	30:00	22:21	00:30	0:45	03:29
IP	30:00	26:11	00:30	0:49	04:03
IR	30:00	16:46	00:30	0:39	02:35
IS	30:00	14:58	00:30	0:37	02:19
IT	30:00	26:28	00:30	0:49	04:01
IW	30:00	32:39	00:30	0:53	04:48
JD	30:00	57:35	00:30	0:54	07:22
JJ	30:00	28:03	00:30	0:34	03:25
JN	30:00	30:45	00:30	0:35	03:40
JO	30:00	54:19	00:30	1:23	04:55
JS	30:00	23:43	00:30	0:32	02:52
JT	30:00	21:56	00:30	0:31	02:40
JU	30:00	57:38	00:30	0:43	06:46
JW	30:00	41:04	00:30	0:57	03:47
JX	30:00	35:34	00:30	0:36	04:01
KH	30:00	45:02	00:30	0:35	04:31
KI	30:00	44:03	00:30	0:40	04:09
KL	30:00	28:32	00:30	0:39	02:33
KQ	30:00	35:14	00:30	0:36	03:17
KY	30:00	27:48	00:30	0:34	02:30
KZ	30:00	20:22	00:30	0:32	01:46
LB	30:00	23:15	00:30	0:33	02:02

4.8.3 Decommissioning Phase

The decommissioning phase will be similar the construction phase but on a smaller scale. No additional effects will occur.

4.8.4 Cumulative Impacts

Potential cumulative impacts may arise from the Proposed Development when combined with other existing, permitted or proposed projects. In accordance with the European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017) and EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).

A review of relevant, large scale, recent planning applications was conducted in order to identify sites with the potential for cumulative impacts. Projects and plans with the potential for cumulative impacts have been identified in Appendix 1.3 Cumulative Assessment - Projects and Plans. While there are several developments in the vicinity of the study area none of these projects have the likelihood to result in cumulative impacts on population and human health.

A number of minor developments have been granted permission within the surrounding area, these are typically associated with extensions or alterations to single buildings. Larger developments are subject to individual environmental assessments and require a construction management plan to mitigate effects of the construction phases. Subject to adherence to measures contained in the individual plans, the cumulative effect is likely, short term and not significant.

The closest operational wind farm development to the Proposed Development is Sliabh Bawn Wind Farm in County Roscommon, ca 20km west of the subject site, comprising 20 turbines. In addition, permission was granted for a single turbine in Lissanore, ca. 14 km southeast of the subject site. Given the distance to the Proposed Development site and subject to adherence to mitigation measures contained in the respective environmental plans, no cumulative impacts are likely to occur.

Prior to undertaking the shadow flicker prediction modelling presented in this chapter, an appraisal of the wider area was undertaken to determine if any cumulative effects could arise with other wind farm developments, including those planned, permitted, and/or operational. Given the distances to the closest wind farm developments, no cumulative shadow flicker impacts are likely to occur.

4.8.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 4.12 Summary of Demolition and Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Employees contributing to local economy	Positive	Slight	Local	Likely	Temporary / Short-term	Direct
Economic opportunities associated with the supply of construction materials and provision of services	Positive	Moderate	Regional	Likely	Temporary / Short-term	Direct
Construction Effects on human health	Negative	Moderate	Local	Likely	Temporary	Direct
Visual Impact	Neutral adverse	Not Significant – Significant	Local	Likely	Temporary / Short-term	Not applicable

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 4.13 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Economic opportunity associated with the operation and maintenance of the proposed development	Positive	Slight	Regional	Likely	Long term	Direct
Shadow flicker	Negative	Imperceptible	Regional	Likely	Long term	Direct
Community Benefit Fund	Positive	Moderate	Local	Likely	Long term	Direct

The decommissioning phase will be similar the construction phase but on a smaller scale. No additional effects will occur.

4.9 Mitigation Measures

4.9.1 Incorporated Design

The layout of the Proposed Development has been designed to maximise the distance of any sensitive receptors from the proposed turbines and no dwelling is located within 800m of the proposed turbines. Based on initial feedback from local residents, the layout has also been reduced form initially 4 proposed turbines, to now 2 proposed turbines.

To ensure the risk to maintenance staff, landowners and site visitors remains negligible throughout the operational life of the Wind Farm, access to the turbines is restricted through a door at the base of the structure, which will be locked at all times outside maintenance visits. Furthermore, fencing will be erected in areas of the site where uncontrolled access is not permitted, and appropriate health and safety signage will also be erected at relevant locations around the site.

As a precaution the turbines will also be fitted with a shadow shutoff system to allow controlling of the turbines and prevent the occurrence of shadow flicker at sensitive receptors surrounding the Wind Farm. This is a function that is integrated into the control system of the wind energy converter. The shutdown times and parameters are determined and programmed into the wind energy converter control system. Shadow shutdown is activated as soon as the shutdown intensity falls below the set values. A technical description of the Shadow shut-off system is included in Appendix 4.1.

The developer will implement a community benefit fund for the Proposed Development which can be used by the local community to invest in and support the wider economic, recreational, environmental, social and cultural amenities and initiatives in the locality of the proposed development.

4.9.2 Demolition and Construction Phase

To minimise the potential impacts from the construction phase, the following mitigation measures are recommended:

- **Construction and Environmental Management Plan (CEMP)**: The appointed contractor(s) will update the Outline CEMP submitted with the application and submit to Longford County Council prior to the commencement of development.
  - The CEMP will comply with all appropriate legal and best practice guidance for construction sites.
  - The purpose of a CEMP is to provide a mechanism for the implementation of the various mitigation measures which are described in this EIAR and to incorporate relevant conditions attached to a grant of permission. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority.
  - All construction personnel will be required to understand and implement the requirements of the Contractor's CEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.

- All mitigation and monitoring measures included in the Summary of Mitigation and Monitoring Measures in Chapter 17 of this EIAR will be included in the CEMP and adhered to.

- **Community Liaison Officer**: The contractor will appoint a community liaison officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the contractor's CEMP.
- **Construction Working Hours** will generally be limited to the hours 0700 – 1900 Monday to Friday and 0700 – 1400 hours on Saturday. To ensure that optimal use is made of good weather periods or at critical periods within the programme it may be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with Longford County Council.
- Project supervisors for the construction phase (**PSCS**) will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013, and a Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phase.
- The **Waste Management Plan** (WMP) will be updated, implemented and maintained by the Contractor.

4.9.3 Operational Phase

The Proposed Development is designed to modern standards that incorporate measures that reduce risks to population and human health. The impact assessment section did not identify likely significant environmental impacts on population and human health arising from the operational phase of the Proposed Development. Accordingly, other than mitigation incorporated in the design and mitigation measures outlined in other chapters of this EIAR relating to human health, no further mitigation measures are proposed with respect to population and human health.

4.9.4 Decommissioning Phase

Any impact that occurs during the decommissioning phase will be similar the construction phase but on a smaller scale. Thus, the mitigation measures outlined for the construction phase will also be implemented during the decommissioning phase. A decommissioning plan will be agreed with the local authorities prior to decommissioning of the Proposed Development.

4.10 Residual Impact Assessment

It is anticipated that the Proposed Development will overall generate slight positive economic benefits for the local community and the wider local area.

Strict adherence to the mitigation measures recommended in this EIAR will ensure that there will be no negative residual impacts or effects on Population and Human Health from the construction, operation and decommissioning of the Proposed Development.

4.11 Risk of Major Accidents or Disasters

The vulnerability of the project to risk of major accidents or natural disasters, such as flooding or soil instability, is discussed primarily in Chapter 8 Land and Soils and Chapter 9 Water and Hydrology. The potential for climate change to impact future flood events is considered as part of the site-specific Flood Risk Assessment and Chapter 14 Climate.

The Proposed Development will not come under the Control of Major Accident Hazards (COMAH) Regulations, therefore there is no potential human health risk from activities associated with COMAH sites. Additionally, there are no COMAH sites located in proximity to the Proposed Development.

The maximum tip height of the turbines is 199.9m and no dwellings located within 800m of the proposed turbine locations, therefore all residential dwellings are significantly removed from site and the risk to residential receptors from fires or turbine collapse is considered low. Furthermore, on the basis of comprehensive turbine base design considerations, safety checks throughout the turbine installation process and frequent maintenance during the operational phase this risk is further reduced.

Overall, it is considered that the potential for an impact on the local population and human health from a major accident or disaster is unlikely.

4.12 Worst Case Scenario

The worst-case scenario on population and human health is considered to be the risk of an accident during the construction phase. According to the Health and Safety Authority[1], in 2023 there were 11 fatal accidents recorded equivalent to 26% of the total fatal work-related incidents. In 2022, 7 fatal accidents occurred in construction equivalent to approx. 25% of the total fatal work-related incidents. This represents an increase from the number recorded the year previous.

The HSA has undertaken a range of activities in regulation, education, accreditation and enforcement to reduce incidents on construction sites. The appointed contractor is required to comply with all relevant Health and Safety legislation and the risk of a fatality is deemed unlikely.

This worst-case scenario is considered **unlikely**, and the significance of the effect is indeterminable.

4.13 Interactions

Please see **Chapter 16** of this EIAR for details on Interactions.

4.13.1 Demolition and Construction Phase

- Landscape and Visual: Construction processes and plant such as cranes used during the construction phase may give rise to visual impacts.

[1] Available via: https://www.hsa.ie/eng/topics/statistics/annual_review_of_workplace_injury_illness_and_fatality_statistics/annual-review-of-workplace-injuries-illnesses-and-fatalities-2021-2022.pdf; and https://www.hsa.ie/eng/news_events_media/news/press_releases_2024/health_and_safety_authority_reports_43_work-related_fatalities_in_2023.html

- Material Assets – Traffic and Transport: Increased construction traffic movements on the local road network during the construction phase may give rise to noise, dust, and road safety impacts.
- Material Assets – Built Services: Excavation during the construction phase may give rise to risks to human health from contact with live electricity lines or damage to live gas pipelines.
- Noise and Vibration: There is potential for effects on human health associated with noise during the construction phase which may impact upon amenity.
- Air Quality: There is potential for impact on human health from dust associated with construction activities and thus impacting air quality.

4.13.2 Operational Phase

- Landscape and Visual: Implemented turbines may give rise to visual impacts.
- Noise and Vibration: There is potential for effects on human health associated with noise during the operational phase.
- Climate: The Proposed Development will contribute to reduce greenhouse gas emissions for future energy production.

4.13.3 Decommissioning Phase

Given the nature of the decommissioning phase, interactions are considered similar to the Construction Phase.

4.14 Monitoring

Measures to avoid negative impacts on Population and Human Health are largely integrated into the design and layout of the Proposed Development. Compliance with the design and layout will be a condition of any permitted development.

No specific monitoring is proposed in relation to this section. Monitoring of standard construction mitigation measures as outlined in this EIAR will be undertaken by the appointed contractor.

Where required, monitoring for other environmental aspects associated with the Proposed Development which may be human related are discussed in the relevant chapters of this EIAR.

4.15 Summary of Mitigation and Monitoring

The following Table summarises the Demolition and Construction Phase mitigation and monitoring measures.

Table 4.14 Summary of Demolition and Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Construction Effects on Human Health	▪ Implementation and adherence to measures in the Construction and Environmental Management Plan	As specified in the final CEMO and WMP.

Likely Significant Effect	Mitigation	Monitoring
	▪ Appointment of a Community Liaison Officer ▪ Adherence to Construction Working Hours ▪ Appointment of qualified Project supervisors ▪ Implementation and adherence to measures in the Waste Management Plan	

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 4.15 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Shadow Flicker	Incorporated Design Mitigation: Turbines will be fitted with a shadow shutoff system	N/A

The following Table summarises the Decommissioning Phase mitigation and monitoring measures.

Table 4.16 Summary of Decommissioning Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Decommissioning Effects on Human Health	▪ Preparation of a Decommissioning Plan ▪ Implementation and adherence to measures in the Construction and Environmental Management Plan ▪ Appointment of a Community Liaison Officer ▪ Adherence to Working Hours ▪ Appointment of qualified Project supervisors for the decommissioning phase ▪ Implementation and adherence to measures in the Waste Management Plan	As specified in the final Decommissioning Plan

4.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the Proposed Development with regards to Population and Human Health. These impacts have been considered for the demolition/construction, operational and decommissioning phases of the proposed development. The cumulative impact of the Proposed Development and surrounding developments have also been

considered. Provided all mitigation measures as set out in this EIAR are adhered to, there are no significant adverse effects predicted.

Issues which may cause risks and hazards during the construction and operational phase of the development are given due consideration. All necessary mitigation measures will be put in place to ensure the health and safety of all site personnel and neighbouring properties. All other environmental aspects relating to the human environment which could have an adverse effect on the local population such as soils, geology & hydrogeology, noise, air quality, water and ecology have been addressed in the relevant chapters of this EIAR.

4.17 References

- National Planning Framework, Ireland 2040 – Our Plan (2018)
- Draft First Revision to the National Planning Framework (July 2024)
- Regional Planning Guidelines for the Greater Dublin Area 2010-2022
- Eastern and Midlands Regional Spatial and Economic Strategy
- Longford County Development Plan 2021-2027
- County Longford Tourism Strategy 2023-2027
- Ireland's Hidden Heartlands Regional Tourism Development Strategy 2023 – 2027
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)
- Central Statistics Office (CSO) website www.cso.ie
- Department of Education and Sciences (DES) website www.education.ie.
- Mordue, T., Moss, O., & Johnston, L. (2020). The impacts of onshore-windfarms on a UK rural tourism landscape: objective evidence, local opposition, and national politics. *Journal of Sustainable Tourism*, *28*(11), 1882–1904. https://doi.org/10.1080/09669582.2020.1769110
- Fáilte Ireland 'Guidelines on the treatment of tourism in an Environmental Impact Statement'.
- Fáilte Ireland 'Visitor Attitudes On The Environment' 2012/ No.1 (Update on 2007 Research)
- HAS Annual Review of Workplace Injuries, Illnesses and Fatalities 2021–2022
- HSA Reports 43 Work-related Fatalities in 2023 via https://www.hsa.ie/eng/news_events_media/news/press_releases_2024/health_and_safety_authority_reports_43_work-related_fatalities_in_2023.html

CHAPTER 5
LANDSCAPE & VISUAL

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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5 Landscape and Visual

5.1 Introduction

This chapter assesses the impacts of the proposed Development (Figure 5.1) on landscape and visual amenity. The Development refers to all elements of the application for the construction of Cloonanny Wind Farm (see Chapter 2: Development Description for full details). Where negative effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment will consider the potential effects during the following phases of the Development:

- Construction of the Development
- Operation of the Development
- Decommissioning of the Development

Common acronyms used throughout this EIAR can be found in Appendix 1.1. This chapter of the EIAR is supported by the following Appendix documents provided in Volume III of this EIAR:

- Appendix 5.1 – Visual Assessment
- Appendix 5.2 – Zone of Theoretical Visibility Maps

Furthermore the LVIA Photomontages accompany the subject planning application under separate cover as a standalone booklet and should be read in conjunction with the Chapter.

An Outline Construction and Environmental Management Plan (CEMP) prepared by Mable Consulting Engineers accompanies the planning application under separate cover. This document will be developed into a Site-Specific Cloonanny CEMP post consent/pre-construction once a contractor has been appointed and will cover construction of the Development. It will include all of the mitigation recommended within the EIAR. For the purpose of this application, a summary of the mitigation measures is included in **Chapter 16 of this EIAR**.

Landscape Impact Assessment (LIA) relates to changes in the physical landscape brought about by the Development, which may alter its character, and how this is experienced. This requires a detailed analysis of the individual elements and characteristics of a landscape that go together to make up the overall landscape character of that area. By understanding the aspects that contribute to landscape character, it is possible to make judgements in relation to its quality (integrity) and to identify key sensitivities. This, in turn, provides a measure of the ability of the landscape in question to accommodate the type and scale of change associated with the proposed Development without causing unacceptable adverse changes to its character.

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from: Visual Obstruction (blocking of a view, be it full, partial or intermittent) or: Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the proposed Development in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

5.1.1 Assessment Structure

In line with the revised EIA Directive and current EPA guidelines the structure of this chapter will consist of separate considerations of landscape effects and visual effects in the following order:

- Assessment of significance
- Assessment of cumulative landscape value and sensitivity
- Assessment of the magnitude of landscape effects within the Study Area
- Assessment of the significance of landscape impacts
- Assessment of visual receptor sensitivity
- Assessment of visual impact magnitude at representative viewpoint locations (using photomontages)
- Assessment of visual impact landscape and visual impacts

5.2 Expertise & Qualifications

This Landscape and Visual Assessment (LVIA) report was prepared by Jorden Derecourt (BLA, MLA, MILI) and reviewed by Richard Barker (MLA, MILI) of Macro Works Ltd, a specialist LVIA company with over 20 years' of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments. Relevant experience includes LVIA work on over 140 onshore wind farm proposals throughout Ireland, including six Strategic Infrastructure Development (SID) wind farms. Macro Works and its senior staff members are affiliated with the Irish Landscape Institute.

5.3 Proposed Development

A brief summary of the development is outlined below. A detailed description of the proposed development is contained within Chapter 2 of this EIAR and the Planning Statement that accompanies the application. The statutory notices should also be referred to.

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

The grid connection from the proposed on-site substation to the national electricity grid does not form part of the subject planning application. However, as part of the planning application process, this EIAR addresses three potential grid connection options currently considered to ensure a comprehensive environmental assessment of all aspects of the Proposed Development. The grid connection will be via 1 of the 3 potential options outlined below:

- Option 1 Connect the proposed development via (8.03km) to Richmond 110kV Substation
- Option 2 Connect the proposed development via (3.96km) to Longford 38kV Substation
- Option 3 Connect the proposed development via (5.85km) to Glebe 38kV Substation

It is anticipated that the grid connection from the Proposed Development will be by means of an underground cable connecting to one of the Substations identified above via the public road network. For bridge crossings, the cable will be located within the bridge deck, where there is insufficient depth and width available horizontal directional drilling (HDD) will be employed as an alternative.

Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

All elements of the proposed development as outlined above together with the turbine delivery route and grid connection options have been assessed as part of this EIAR.

5.3.1 Aspects Relevant to this Assessment

The aspect of the development with the highest relevance are the two E175 EP5 wind energy converters. The change in visual and landscape characteristics of the study area as a result of the addition of the wind energy converters (turbines) and the other built features such as the Battery Energy Storage System and Substation will be assessed in relation to the surrounding landscape and visual characteristics. The change to physical and visual characteristics through construction impacts will be assessed within the against the existing landscape baseline, as will the operational and decommissioning works.

5.4 Assessment Methodology and Significance Criteria

5.4.1 Assessment Methodology

Production of this Landscape and Visual Impact Assessment (LVIA) involved baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed the following:

5.4.2 Desktop Study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the proposed wind farm;
- Review of a Zone of Theoretical Visibility (ZTV) map, which indicates areas from which the development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations and associated policies and objectives;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

5.4.3 Fieldwork

- Recording of a description of the landscape elements and characteristics within the Study Area
- Selection of a refined set of VRP's for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages.

5.4.4 Appraisal

- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the study area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses; transport routes; public amenities and facilities and; designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant effects and the mitigation measures that could be employed to reduce such effects.
- Estimation of the significance of residual landscape effects.
- Estimation of the significance of residual visual effects aided by photomontages prepared at all of the selected VRP locations.
- Estimation of cumulative landscape and visual effects in combination with other surrounding developments that are either existing, permitted or in the planning system and pending a decision from a planning authority. Projects that are at the pre-planning stage where information is available to the public are also included in the cumulative impact assessment. It is worth noting that the EIA Directive requires only that other existing and/or approved projects be considered. A more conservative approach has been adopted here, with consideration of the cumulative impacts arising in connection with known projects at the pre-planning stage. As these 'known' projects progress through the development management process, a full assessment of the landscape and visual effects, including in-combination effects, will be undertaken for that project in advance of a decision being made.

5.4.5 Relevant Legislation and Guidance

The LVIA adheres to methodology as prescribed in the following guidance documents:

- European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);
- Environmental Protection Agency (EPA) (2022) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)'
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Addition (2013).
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. [online]
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006).

- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2019 draft). [1]
- Scottish Natural Heritage Visual Representation of Wind Farms: Best Practice Guidelines (version 2.2 - 2017).

Use of the Term 'Effect' vs 'Impact' the GLVIA advises that the terms 'impact' and effect' should be clearly distinguished and consistently used in the preparation of an LVIA.

'Impact' is defined as the action being taken. In the case of the proposed works, the impact would include the construction of the proposed project.

'Effect' is defined as the change or changes resulting from those actions, e.g. a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focusses on these effects.

Another key distinction to make in a LVIA is between landscape effects and the visual effects of development.

'Landscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. 'Landscape character assessment' is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as 'a resource'. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

Views and 'visual amenity' refer to the interrelationship between people and the landscape. The GLVIA prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

5.4.6 Definition of Study Area

The Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government (current 2006 and Draft Revised 2019) specify different radii for examining the zone of theoretical visibility of proposed windfarm projects (ZTV). The extent of this search area is influenced by turbine height, as follows:

- 15km radius for blade tips up to 100m
- 20km radius for blade tips greater than 100m
- 25km radius where landscapes of national and international importance exist.

[1] *It is important to note that all information and guidelines relating to landscape areas and types in the current wind energy development guidelines (2006) are duplicated in the draft revised wind energy development guidelines (2019). The only additional information relating to landscape and visual in the draft revised guidelines relates to the visual amenity setbacks. Thus, the current (2006) and draft revised (2019) guidelines have been referenced.*

In the case of this project, the blade tips are 199.9m high and, thus, the minimum ZTV radius recommended is 20 km from the outermost turbines of the scheme (see **Figure 5.2**). This is considered to be appropriate in this instance on the basis that significant impacts are not predicted to occur beyond 20km. Furthermore, there are not considered to be any sites of national or international importance between 20 – 25km and thus, the radius of the study area will remain at 20km. Notwithstanding the full 20km extent of the LVIA study area, there will be a particular focus on receptors and effects within the Central Study Area where there is higher potential for significant impacts to occur. When referenced within this assessment, the 'Central Study Area' is the landscape within 5km of the Site.

5.4.7 Computer Generated Images, Photomontages and Wireframes

This LVIA is supported by a variety of computer generated maps and graphics as well as verifiable photomontages that depict the Development within the views from a range of represented visual receptor locations. These maps, graphics and visualisations consist of the following:

- Zone of Theoretical Visibility (ZTV) maps.
- Photomontages consisting of existing views, wireframe views and proposed views.

5.4.8 Assessment Criteria for Landscape Effect

The classification system used by Macro Works to determine the significance of landscape and visual impacts is based on the IEMA Guidelines for Landscape and Visual Impact Assessment (2013). When assessing the potential impacts on the landscape resulting from a windfarm development, the following criteria are considered:

- Landscape character, value and sensitivity
- Magnitude of likely impacts
- Significance of landscape effects

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new features without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria (refer to Table 5.1):

Table 5.1 Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.

Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the Development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the Site Boundary that may have an effect on the landscape character of the area (refer to Table 5.2 below).

Table 5.2 Magnitude of Landscape Impacts

Magnitude	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix (refer to Table 5.3 below).

Table 5.3 Landscape Impact Significance Matrix

	Sensitivity of Receptor				
Scale/Magnitude	**Very High**	**High**	**Medium**	**Low**	**Negligible**
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible
Note: Judgements deemed 'substantial' and above are considered to be 'significant impacts' in EIA terms.					

5.4.9 Assessment Criteria for Visual Effect

As with the landscape impact, the visual impact of the Development will be assessed as a function of receptor sensitivity versus magnitude. In this instance, the sensitivity of visual receptors, weighed against the magnitude of visual effects.

5.4.9.1 Visual Sensitivity

Unlike landscape sensitivity, visual sensitivity has an anthropocentric basis. Visual sensitivity is a two-sided analysis of receptor susceptibility (people or groups of people) versus the value of the view on offer at a particular location.

To assess the susceptibility of viewers and the amenity value of views, the assessors use a range of criteria and provide a four-point weighting scale to indicate how strongly the viewer/view is associated with each of the criterion. Susceptibility criteria is extracted directly from the IEMA Guidelines for Landscape and Visual Assessment (2013), whilst the value criteria relate to various aspects of a view that might typically be related to high amenity including, but not limited to, scenic designations. These are set out below:

- **Susceptibility of receptor group to changes in view**. This is one of the most important criteria to consider in determining overall visual sensitivity because it is the single category dealing with viewer susceptibility. In accordance with the IEMA Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:
  - "Residents at home
  - People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views
  - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience

- Communities where views contribute to the landscape setting enjoyed by residents in the area
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
- "Visual receptors that are ***less*** susceptible to changes in views and visual amenity include:
  - People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape
  - People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

- **Values typically associated the visual amenity**
  - **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, at least, a public consultation process is required.
  - **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated with the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them.
  - **Intensity of use, popularity**. Whilst not reflective of the amenity value of a view, this criterion relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale.
  - **Connection with the landscape**. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it.
  - **Provision of elevated panoramic views**. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas.
  - **Sense of remoteness and/or tranquillity**. Remote and tranquil viewing locations are more likely to heighten the amenity value of a view and have a lower intensity of development in comparison to dynamic viewing locations such as a busy street scene, for example.
  - **Degree of perceived naturalness**. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by obvious human interventions.
  - **Presence of striking or noteworthy features**. A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle.

- **Historical, cultural or spiritual value**. Such attributes may be evident or sensed at certain viewing locations that attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings.
- **Rarity or uniqueness of the view**. This might include the noteworthy representativeness of a certain landscape type and considers whether other similar views might be afforded in the local or the national context.
- **Integrity of the landscape character in view**. This criterion considers the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components.
- **Sense of place**. This criterion considers whether there is special sense of wholeness and harmony at the viewing location.
- **Sense of awe**. This criterion considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations where highly susceptible receptors or receptor groups are present and which are deemed to satisfy many of the view value criteria above are likely to be judged to have a high visual sensitivity and vice versa.

5.4.9.2 Magnitude of Visual Effects

The magnitude of visual effects is determined on the basis of two factors; the visual presence of the proposed project and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects beyond simply scale in relation to distance. Some of these include the extent of the view as well as its complexity and the degree of existing contextual movement experienced such as might occur where turbines are viewed as part of / beyond a busy street scene. The backdrop against which the project is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is expressed as such, i.e. minimal, sub-dominant, co-dominant, dominant, highly dominant.

For wind energy developments, a strong visual presence is not necessarily synonymous with adverse impact. Instead, the 2012 Fáilte Ireland survey entitled 'Visitor Attitudes On The Environment – Wind Farms' found that *"Compared with other types of development in the Irish landscape, wind farms elicited a positive response when compared to telecommunication masts and steel electricity pylons"….* and that *"most (tourists) felt that their presence did not detract from the quality of their sightseeing, with the largest proportion (45%) saying that the presence of the wind farm had a positive impact on their enjoyment of sightseeing…".* The purpose here is not to suggest that turbines are either inherently liked or disliked, but rather to highlight that the assessment of visual impact magnitude for wind turbines is more complex than just the degree to which turbines occupy a view. Furthermore, a clear and comprehensive view of a wind farm might be preferable in many instances to a partial, cluttered view of turbine components that are not so noticeable within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding

terrain and land cover. It also examines whether the project contributes positively to the existing qualities of the vista or results in distracting visual effects and disharmony.

It should be noted that as a result of this two-sided analysis, a high order visual presence can be moderated by a low level of effect on visual amenity and vice versa. Given that wind turbines do not represent significant bulk, visual impacts result almost entirely from visual 'intrusion' rather than visual 'obstruction' (the blocking of a view). The magnitude of visual effect is classified in Table 5.4 below.

Table 5.4 Magnitude of Visual Effect

Criteria	Description
Very High	The proposal obstructs or intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. An extensive degree of visual change will occur within the scene completely altering its character, composition and associated visual amenity
High	The proposal obstructs or intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual change will occur within the scene substantially altering its character, composition and associated visual amenity
Medium	The proposal represents a moderate intrusion into the available vista and is a readily noticeable element. A noticeable degree of visual change will occur within the scene perceptibly altering its character, composition and associated visual amenity
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not influence the visual amenity of the scene

5.4.9.3 Significance of Visual Effect

As stated above, the significance of visual effect is a function of visual receptor sensitivity and magnitude of visual effect This relationship is expressed in the same significance metric included for Landscape Effect Significance at Table 5.3.

5.4.10 Quality and Timescale in Effects

In addition to assessing the significance of landscape effects and visual effects, the 2022 EPA Guidance for EIARs requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial. In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial.

Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;

- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

5.4.11 Consultation

Pre Planning Consultation with Longford County Council was held in April 2024. Feedback was received regarding view points /areas to include in the LVIA which has been considered and included in the assessment in this chapter.

5.5 Difficulties Encountered

No difficulties were encountered in compiling the required information.

5.6 Baseline Environment

5.6.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposal will be assessed. This also includes reference to any relevant landscape character appraisals and the current landscape policy context (both are generally contained within County Development Plans).

A description of the landscape context of the proposed wind farm site and wider study area is provided below under the headings of landform and drainage and vegetation and land use. Centres of population, transport routes and tourism, recreation and heritage features form part of the visual baseline and are dealt with in Section 5.6.5.

Figure 5.1 Aerial photograph showing the landscape context of the site and its immediate surrounds.

5.6.2 Landform and Drainage

The proposed project is located across flat to rolling farmland to the northeast of Longford town. The site terrain is generally flat, ranging in elevation from 40m AOD to c.50m AOD, with T1 located slightly higher than T2. The site gently slopes southwards to the Camlin River, the nearest watercourse, at a distance of c.200m south.

The immediate surrounds of the site and central study area are relatively uniform, with the primary features being the Shannon River 7.3km to the west and the rolling landform of Corn Hill 7km to the northeast. These two features define the overall patterns of the study area, with the west defined by the Shannon, while the east features a gentle upward slope to a series of small rolling hills slightly over

100m asl. Between the two, across the central study area, is a relatively even landscape of rolling drumlins.

The Shannon Corridor (7.5km to the west) also features the largest waterbodies of the study area, including Lough Ree to the south, Lough Forbes to the west, Lough Bofin and Rinn Lough to the northwest, and Lough Gowna to the northeast. There are also a number of smaller waterbodies in the lower sections of the drumlins, such as Lough Sallagh and Annagh Lough. In a similar pattern, to the west and southwest of the study area along the Shannon Corridor, there are a number of bogs of varied sizes, with the largest being the Derryadd, Derryaroge and Lough Bannow Bogs, which stretch around 12 km in an elongated band in a northwest-southeast orientation. These larger bogs are more exploited and feature engineered drains as the main water features. The last major water feature is the Grand Canal, which joins the Shannon at Cloondara Harbour to the west of the site and Longford. The Royal Canal runs south along the west of the study area, turning to the east along the south of the study area.

5.6.3 Vegetation and Land Use

Peatland areas occur frequently throughout the study area as well on both sides of the River Shannon, particularly to the west of the site. The peat bogs in this area are frequently interspersed with slightly elevated islands of free-draining soils that are used for agriculture, whilst the transitional bog margins tend to be contained in peatland scrub or occasional commercial conifer plantations. Conifer plantations also occur in some of the more elevated areas, but in the context of the study area, agricultural framing is the predominant land use, forming a matrix of fields and hedgerows.

The northwest of the study area features smaller and partially intact bogs. Along the southwest of the study area, the bogs are larger and more exploited, as listed above; these include Derryadd, Derryaroge and Lough Bannow Bogs. There are also scattered forestry areas over the wider south of the study area, in a similar manner to the north, except of smaller patches and scattered, rather than confined to the perimeter of bogs.

Field sizes are varied across the site, with smaller, irregular field sizes tracing the landform and drainage features identified above, getting larger where more cohesive areas of farmland occur, such as approx. 5km offset around the site and to the northeast, between the two small upland areas.

There are a number of substantial settlements throughout the study area that serve as rural service centres, the nearest of these is Longford, located 1-3km from the proposed turbines. Others include Newtown Forbes, Roosky, Termonbarry, and Lanesborough along the Shannon to the west, Edgeworthstown to the southeast and Granard to the northeast.These settlements account for a very modest proportion of urban and industrial land cover in the context of the study area.

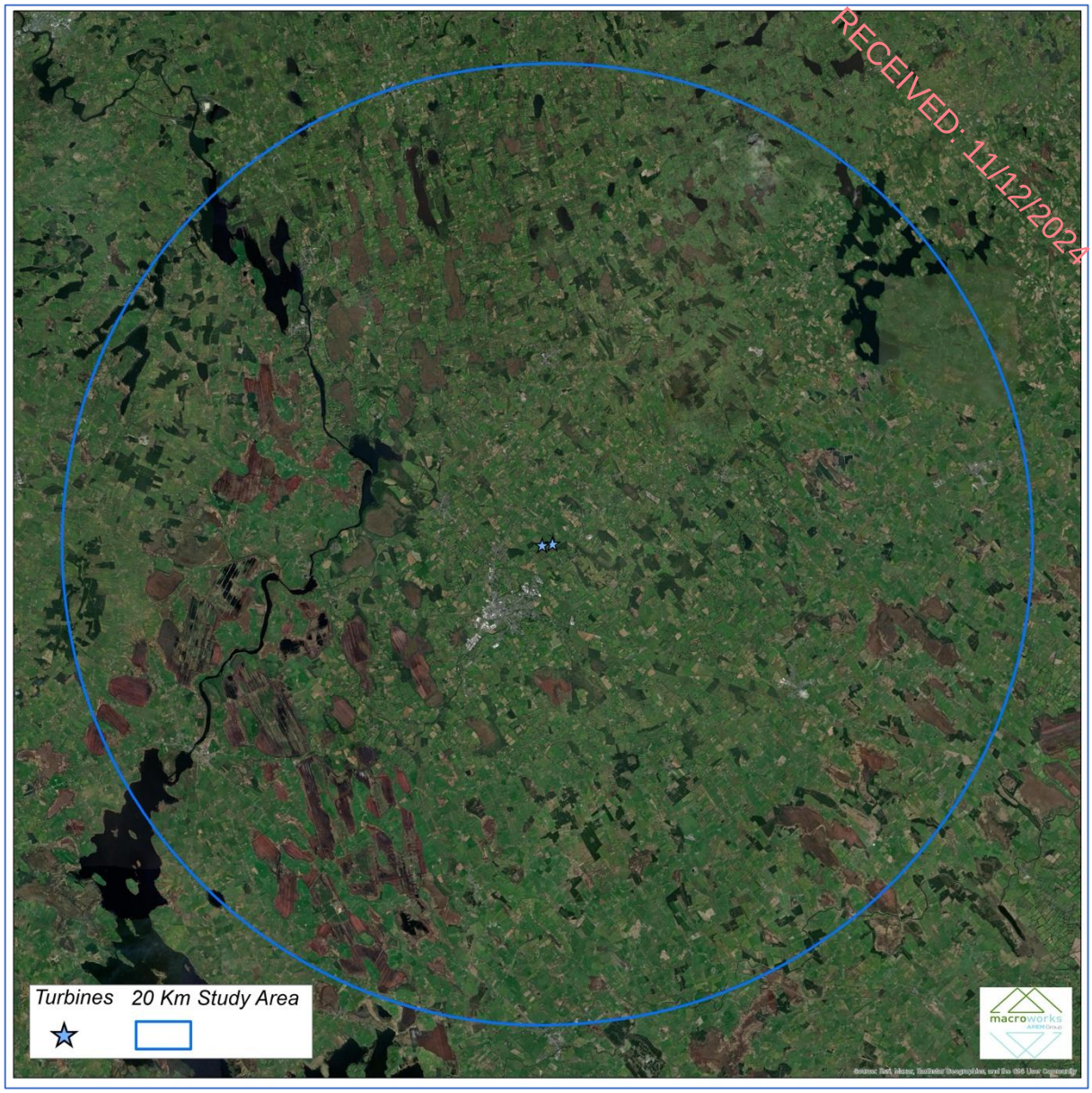

Figure 5.2 Aerial photograph showing the landscape context of the wider study area.

5.6.4 Landscape Policy Context and Designations

5.6.4.1 The Department of Environment, Heritage and Local Government Wind Energy Development Guidelines 2006 and draft revised 2019 Wind Energy Development Guidelines

The Wind Energy Development Guidelines (2006) provide guidance on wind farm siting and design criteria for a number of different landscapes types. The site of the proposed project is located within a the drumlin landscape context east of the Shannon River. The setting of the proposed project is most consistent with the 'Hilly and Flat Farmland' type described in the 2006 Guidelines. However, proximity to Longford introduces a second landscape type to the central study area, this being 'Urban and Industrial', located 1.5-2km to the southwest. The wider context also encompass characteristics of 'Flat Peatland' landscape types to the west. Siting and design recommendations for the 'Hilly and Flat Farmland' landscape type and 'Urban and Industrial' landscape type are included below.

Table 5.5 Hilly and Flat Farmland Landscapes

Criteria	Description
Location	"Location on ridges and plateaux is preferred, not only to maximise exposure, but also to ensure a reasonable distance from dwellings. Sufficient distance should be maintained from farmsteads, houses and centres of population in order to ensure that wind energy developments do not visually dominate them. Elevated locations are also more likely to achieve optimum aesthetic effect. Turbines perceived as being in close proximity to, or overlapping other landscape elements, such as buildings, roads and power or telegraph poles and lines may result in visual clutter and confusion. While in practice this can be tolerated, in highly sensitive landscapes every attempt should be made to avoid it."
Spatial extent	"This can be expected to be quite limited in response to the scale of fields and such topographic features as hills and knolls. Sufficient distance from buildings, most likely to be critical at lower elevations, must be established in order to avoid dominance by the wind energy development."
Spacing	"The optimum spacing pattern is likely to be regular, responding to the underlying field pattern. The fields comprising the site might provide the structure for spacing of turbines. However, this may not always be the case and a balance will have to be struck between adequate spacing to achieve operability and a correspondence to field pattern."
Layout	"The optimum layout is linear, and staggered linear on ridges (which are elongated) and hilltops (which are peaked), but a clustered layout would also be appropriate on a hilltop. Where a wind energy development is functionally possible on a flat landscape a grid layout would be aesthetically acceptable."
Height	"Turbines should relate in terms of scale to landscape elements and will therefore tend not to be tall. However, an exception to this would be where they are on a high ridge or hilltop of relatively large scale. The more undulating the topography the greater the acceptability of an uneven profile, provided it does not result in significant visual confusion and conflict."
Cumulative	"It is important that wind energy development is never perceived to visually dominate. However, given that these landscapes comprise hedgerows and often hills, and that views across the landscape will likely be intermittent and partially obscured, visibility of two or more wind energy developments is usually acceptable."

Table 5.6 Urban and Industrial Landscapes

Criteria	Description
Location	"A wind energy development can be placed sufficiently close to the structures concerned in order to establish a visual relationship but sufficiently distant to ensure a certain autonomy. The wind energy development should appear as a distinct and discrete entity.."
Spatial extent	"This should be determined by the spatial extent and height of the existing structures making up the urban and/or industrial context. Generally, therefore, it is likely to be relatively limited. a) Large wind energy development with random layout contiguous to town that can be inappropriate b) Small wind energy development with regular layout contiguous to town. Regarding its spatial extent, this wind energy development is appropriate to the scale of the hill and town and a thematic association is created with the existing telecommunication towers in terms of technological image.
Spacing	"Regular spacing will usually provide the greatest possibility of visual integration. A graded spacing, however, could be used to aesthetic effect, depending on how it was composed in relation to the built context."
Layout	"The optimum layout is linear, and staggered linear on ridges (which are elongated) and hilltops (which are peaked), but a clustered layout would also be appropriate on a hilltop. Where a wind energy development is functionally possible on a flat landscape a grid layout would be aesthetically acceptable."
Height	"Where only a very small wind energy development is involved, tall turbines could create a dramatic contrast with existing structures. Otherwise, turbines should be selected so as not to visually overpower existing structures. An even profile would typically be preferred in order to ensure simplicity and reduce the likelihood of visual confusion, but an uneven profile may be acceptable depending on contextual relationships.
Cumulative	"In urban areas there is little or no tolerance of more than one wind energy development due to the likely sense of clutter and possible feeling of dominance."

It is considered that the proposed wind farm developments' siting and design respond well and are generally consistent with the guidance note above for the 'Hilly and Flat Farmland' and 'Urban and Industrial' landscape types. The location is most in keeping with the 'Urban and Industrial' description, is in keeping with both descriptions regarding spatial extent (limited) and spacing (regular). Early-stage analysis resulted in the reduction of a three-turbine layout to a two-turbine layout. While the proposed height of the turbines is taller than those typically suggested above, the offset from surrounding large or cluttered structures and isolation from cumulative developments are in keeping with the above guidelines.

5.6.4.2 Siting in Relation to Individual Properties ('Setback')

The proposed development has been designed and sited to adhere the 2006 guidelines, therefore, no residential property is located within 500m of the closest proposed turbine. The location of the proposed turbines in relation to the nearest residential Eircode is T1: 803.43m away, T2: 800.32m away.

It is worth noting that the Draft Revised Guidelines 2019 are not yet adopted. However, best efforts have been made to achieve the 4x tip height setbacks from sensitive receptors as required in the 2019

draft revised guidelines, in this instance 799.6m (4 x 199.9m tip height). As per 2019 guidelines, the nearest point of the curtilage relates to 3 residential properties at a distance of c. 785m, c. 790m and c. 799m to the nearest proposed turbine while only two of the tree associated dwellings have a setback of c. 795m from the proposed turbines. All other residential properties in the area are located at a distance greater than 799.6m of both proposed turbines.

5.6.4.3 Longford County Development Plan (2021 – 2027)

5.6.4.3.1 Landscape Character Assessment

A Landscape Character Assessment was prepared as part of the Longford County Development Plan 2015-2021 and is contained in Annex 11 and summarised within Chapter 14 of the current Longford County Development Plan 2021-2027. The County is divided into 7 no. geographically distinct Landscape Character Types (LCTs) (Figure 5.3 refers). The Proposed Development is contained within 'LCT Unit 4 – Central Corridor'. The study area overlays all of the remaining Landscape Character types to varying degrees. This landscape character unit is surrounded by three other LCT Units, namely; 'LCT 6 – Peatlands' to the south, LCT Unit 7 – Open Agriculture', which lies to the southeast and 'LCT 2 – Northern Upland' to the north. Smaller areas of the study area are overlaid by the remaining Landscape Character Units, these being 'LCT Unit 3 – Shannon Basin/Lough Ree', which lies to the west, 'LCT Unit 1 – Northern Drumlin Lakeland', which lies to the north, and 'LCT 5 – Inny Basin' to the eastern periphery of the county and study area.

In the Longford County Development Plan, LCT Unit 4 – Central Corridor is described as "*As with the rest of the County, the main landcover constituent in this unit consists of agricultural pastures. The urban fabric of Longford Town, Edgeworthstown and Newtownforbes also cover extensive areas. Deciduous and mixed forestry are present in pockets throughout the centre of the unit, notably at Carrickglass and Farraghroe. The land in this unit is relatively flat and low-lying, rarely breaking the 100-metre contour line, meaning that trees, field boundaries, buildings and other features generally restrict views over any significant distance. This is contrasted with areas of distinct demesne type landscapes such as at Moatfarrell/Corbeagh."* The landscape character assessment also identifies sensitivity designations for each of the given units. Unit 4 – Central Corridor has been identified as *"generally LOW. Potential areas of MEDIUM to HIGH sensitivity exist in the vicinity of protected woodlands, riverbanks and in the vicinity of the Aquifer".*

The Longford County Development Plan contains five County Policy Objectives specifically related to LCT Unit 4 – Central Corridor:

> *'CPO14.24-Restrict development in pressure areas;*
>
> *CPO14.25-Relax restrictions in areas of high capacity*
>
> *CPO14.26-Install Groundwater protection scheme around potential groundwater supplies*
>
> *CPO14.27-Identify and protect important areas of agricultural land from further fragmentation*
>
> *CPO14.28-Encourage use of existing large-scale communications infrastructure for future proposed developments*

The Longford County Development Plan also has the following general County Policy Objectives related to landscape listed in Chapter 14:

'CPO14.1-Support and implement objectives contained in any Regional Landscape Character Assessment.

CPO14.2-Review in the context of a regional approach to landscape assessment, the County Landscape Character Assessment following publication of statutory guidelines for Planning Authorities on local Landscape Character Assessments, as outlined in the National Landscape Strategy 2015-2025.

CPO14.3-Protect the landscapes and natural environments of the County by ensuring that any new developments do not detrimentally impact on the character, integrity, distinctiveness or scenic value of their area. Any development which could unduly impact upon such landscapes will not be permitted.

CPO14.4-Ensure the preservation of the uniqueness of a landscape character type by having regard to the character, value and sensitivity of a landscape in new development proposals. Any new development should respect and reinforce the distinctiveness and sense of place of the landscape character types, including the retention of important features or characteristics, taking into account the various elements which contribute to their distinctiveness.

CPO14.5-Conserve and enhance the high nature conservation value of the Landscape Character Areas in order to create/protect ecologically resilient and varied landscapes.

CPO14.6-Discourage proposals necessitating the removal of an extensive number of trees, hedgerows and historic walls or other distinctive boundary treatments and consider the making of Tree Preservation Orders in respect of trees or groups of trees of particular landscape value.

CPO14.7-Require landscape and visual impact assessments prepared by suitably qualified professionals to be submitted with planning applications for development which may have significant impact on landscape character areas of medium or high sensitivity.

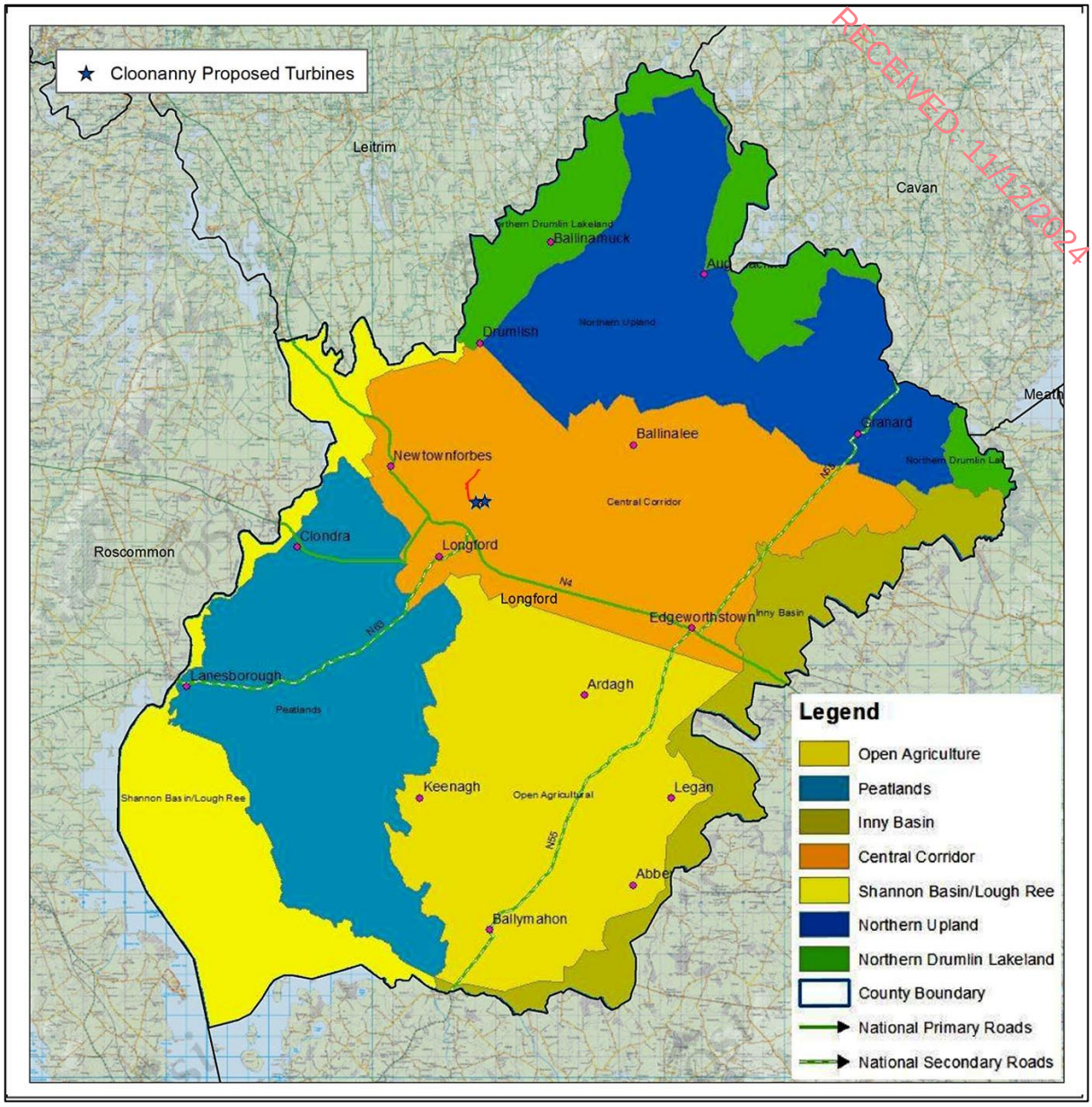

Figure 5.3 Extract of Figure 14.1 from the Longford County Development Plan showing Landscape Character

5.6.4.3.2 Wind Energy Strategy

Volume 2 Appendix 2 of the Longford County Development Plan 2021-2027 contains a map showing Wind Energy Potential within the county (Figure 5.4 refers). There are buffer zones around the main settlements where turbines are to be avoided. Similarly there are specific 'non-preferred locations' identified within the county. These are contrasted with specific 'preferred locations', while the majority of the county is not contained within any of these three categories, indicating that proposed turbines would be open to consideration across most of the county.

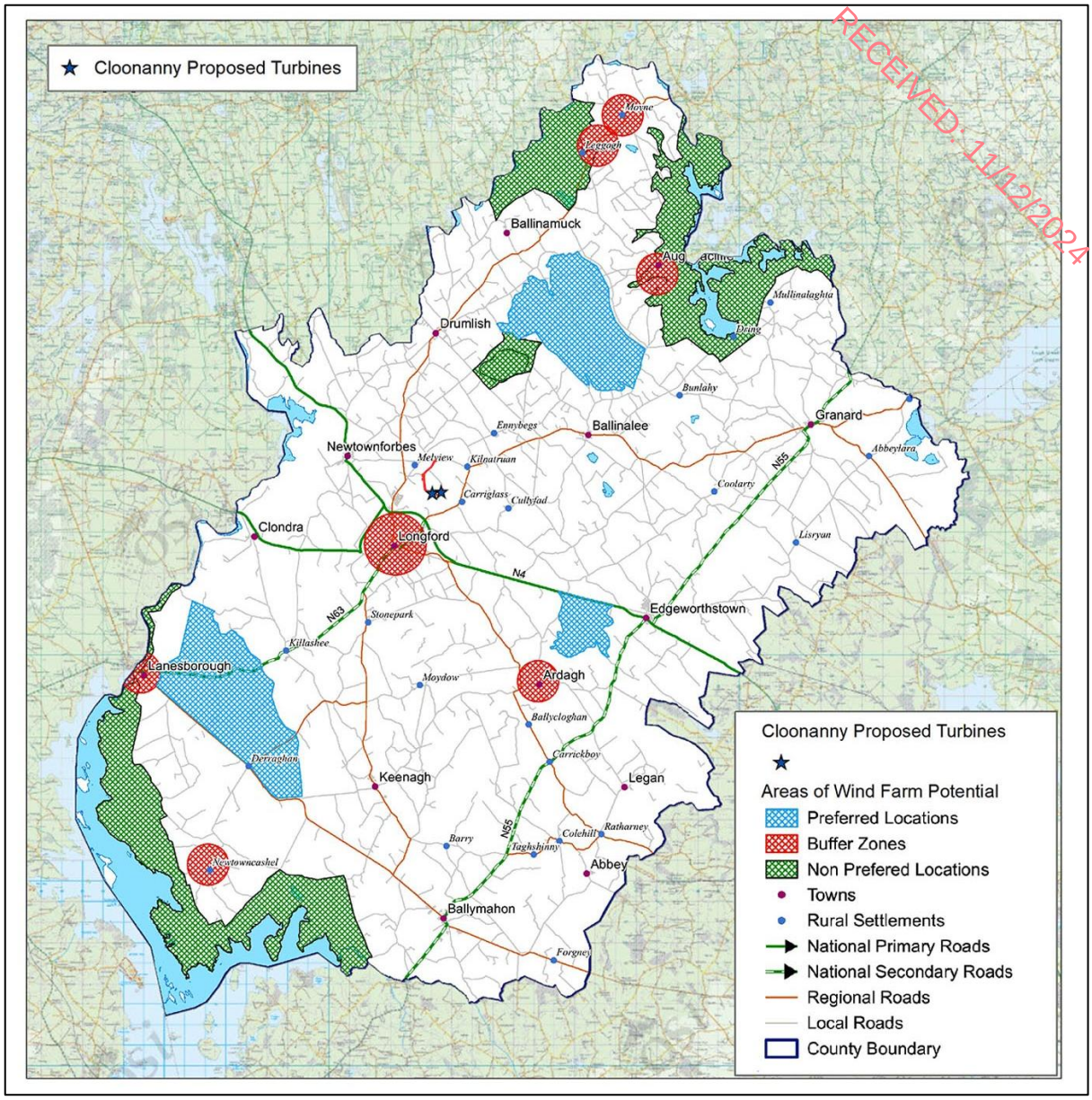

Figure 5.4 Extract of Volume 2 Appendix 2 from the Longford County Development Plan showing Wind Energy Potential

5.6.4.4 Roscommon County Development Plan (2022 – 2028) Landscape Character Assessment

Whilst the Proposed Development extends throughout the south-western portion of County Longford, it is within 10km (c. 7km) of County Roscommon and therefore has the potential to influence the landscape character and scenic designations of the nearest parts of this neighbouring County. Thus, relevant designations and landscape policy for County Roscommon are also considered herein.

A landscape character assessment is included within the current Roscommon County Development Plan and this divides the County in to 7 no. Landscape Character Types (LCTs). The 'River Corridor' LCT is the most relevant to the Proposed Development as it encompasses the western banks of the River Shannon and Lough Ree, which occur immediately across the Longford – Roscommon border. The generic Landscape Character Types are then further divided into 36 no. geographically distinct

Landscape Character Areas (LCAs). A number of these are contained within the 'River Corridor' LCT within the western half of the study area. The most relevant LCA is 'LCA 5 – Slieve Bawn and Feorish Bogland Basin. This LCA has been designated as landscapes of 'Very High Value' (second highest of 4 classifications).

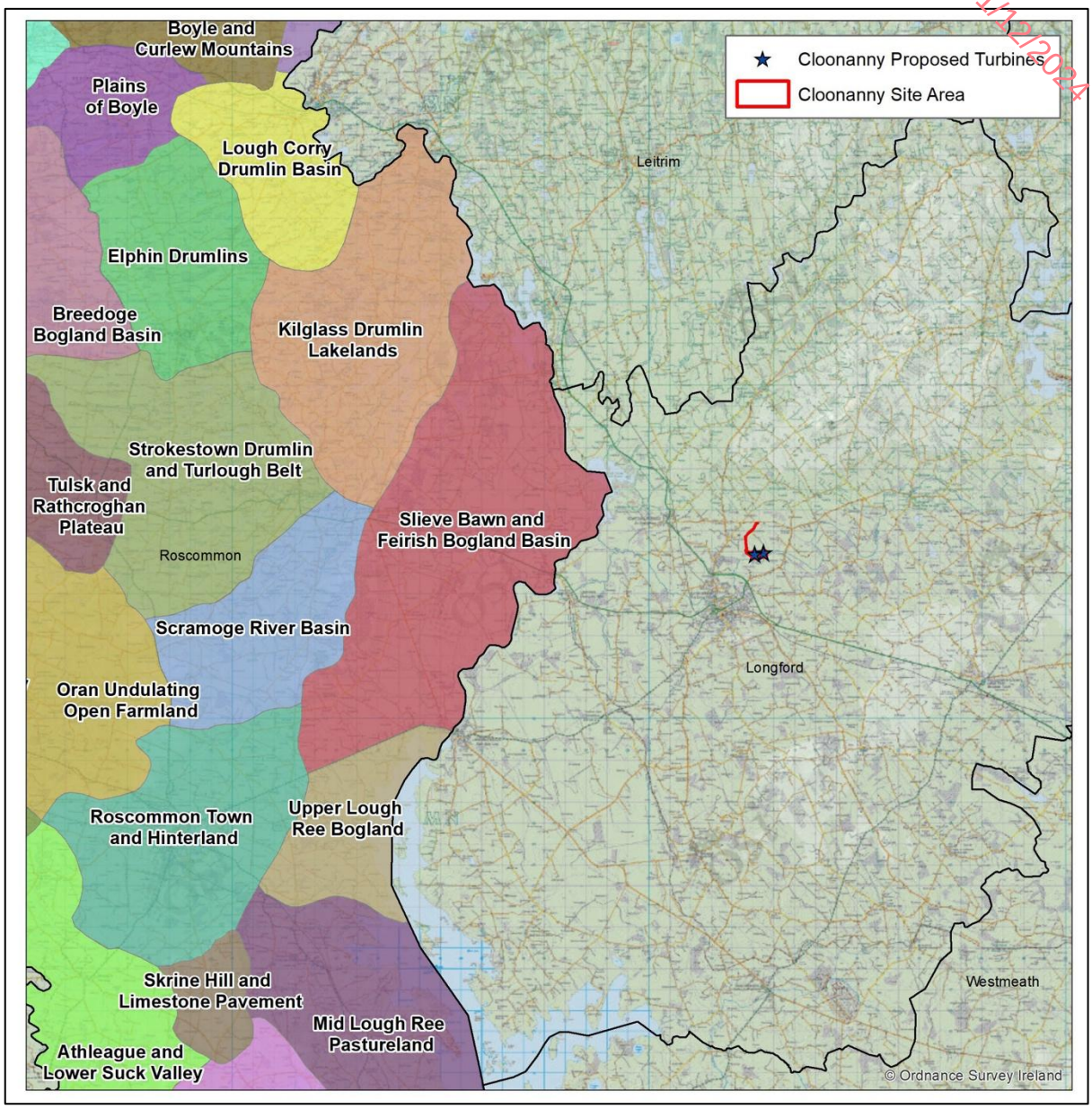

Figure 5.5 Extract of Figure 8 from the Roscommon Landscape Character Assessment – Relevant landscape character areas

The landscape contained in '*LCA 5 - Slieve Bawn and Feorish Bogland Basin*' is described as:

> *"….. one of the largest character areas in the county stretching from Lanesborough in the south to Lough Bo Derg in the north. Slieve Bawn forms the western edge from where the landform gently slopes eastward draining into low lying bogland where it meets the eastern boundary defined by the meandering Shannon."*

LCA 5 is identified as having a 'Very High' value as it is "one of the most varied in the entire county, comprising a major waterway, extensive bogland and forest upland."

5.6.4.5 Leitrim County Development Plan 2023-2029

Whilst the proposed development is wholly contained within County Longford, the Leitrim County boundary is some 7km northeast of the site at its nearest point, and thus consideration is made of the landscape designations in the current Leitrim County Development Plan

Scenic designations located within the study area are addressed in the following section.

5.6.4.5.1 Leitrim Landscape Character Assessment 2020 Review

The current Landscape Character Assessment review identifies 17 contrasting Landscape Character Types (LCTs) within County Leitrim and a further 14 Landscape Character Areas (LCAs). The nearest of these to the site is LCA 13 – South Leitrim Drumlins and Shannon Basin, which overlays much of the area of Leitrim within the study area, and a land portion of southern Leitrim. At the northern border of the study area there us a small section of LCA 14 – Corriga Uplands.

5.6.4.5.2 Leitrim CDP – Appendix VII – Review of Landscape Designations

In addition to the review of the landscape assessment, the current Leitrim County Development Plan includes a review of landscape designations throughout the county. The review includes an updated map of the proposed landscape designations for County Leitrim, which includes eight 'Areas of Outstanding Natural Beauty' (AONB) and twelve 'Areas of High Visual Amenity' (AHVA).

Area of High Visual Amenity (AHVA) B11 River Shannon and Lakes applies to a linear stretch of LCA 13 in the west; and Area of High Visual Amenity (AHVA) B12 Lough Rynn, Lough Errew and Environs applies to a small part of this LCA in the south. There are three Protected Views and Prospects within the LCA, only one of which is located within the study area, and is included in the visual baseline, below. No designated landscapes, views and prospects occur within the Corriga Uplands LCA.

5.6.4.6 Westmeath County Development Plan (2021-2027)

As County Westmeath is situated over 14km from the Proposed Development at its nearest point, it is not thought that its landscape character will be influenced by the Proposed Development, and therefore has not been included within this appraisal beyond the scenic designation included in the visual baseline section, below.

5.6.4.7 Cavan County Development Plan (2022-2028)

Whilst the proposed development is wholly contained within County Longford, the Cavan County boundary is 16km north of the site at its nearest point, and thus, the primary concern is scenic designations, which, if located within the study area, are included in the visual baseline section, below.

5.6.4.8 Conservation Interests

Although conservation designations are principally the concern of the Ecology and Hydrology chapters of the EIAR, they also represent landscape-based features and areas that are likely to have naturalistic characteristics that contribute to the overall landscape character of an area. For the purposes of the

landscape appraisal it is mainly those conservation designations within the central study area (5km from the site) that are most relevant. See Chapter 10 (Biodiversity) for further detail.

The National Parks and Wildlife Services (NPWS) designated areas that are situated within the central portion of the study area and include; Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs), and proposed Natural Heritage Areas (pNHAs) – these are outlined below:

- Proposed Natural Heritage Area: Carrickglass Demesne
- Special Area Conservation: Brown Bog SAC
- Ballykenny-Fisherstown Bog SPA
- Proposed Natural Heritage Area: Royal Canal
- Proposed Natural Heritage Area: Derrymore Bog
- Special Area Conservation: Ardagullion Bog SAC
- Natural Heritage Area: Mount Jessop Bog NHA
- Lough Forbes Complex SAC and pNHA;

5.6.5 Visual Baseline

Only those parts of the study area that potentially afford views of the proposed project are of interest to this part of the assessment. Therefore, the first part of the visual baseline is establishing a 'Zone of Theoretical Visibility' (ZTV) and subsequently, identifying important visual receptors from which to base the visual impact assessment.

5.6.5.1 Zone of Theoretic Visibility

A computer-generated ZTV map has been prepared to illustrate from where the proposed project is potentially visible. A large scale map of a ZTV showing the potential visibility up to the highest possible hub height of the proposed turbines is also included in Appendix 5.2. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the proposed project will definitely not be visible, due to terrain screening within the 20km study area.

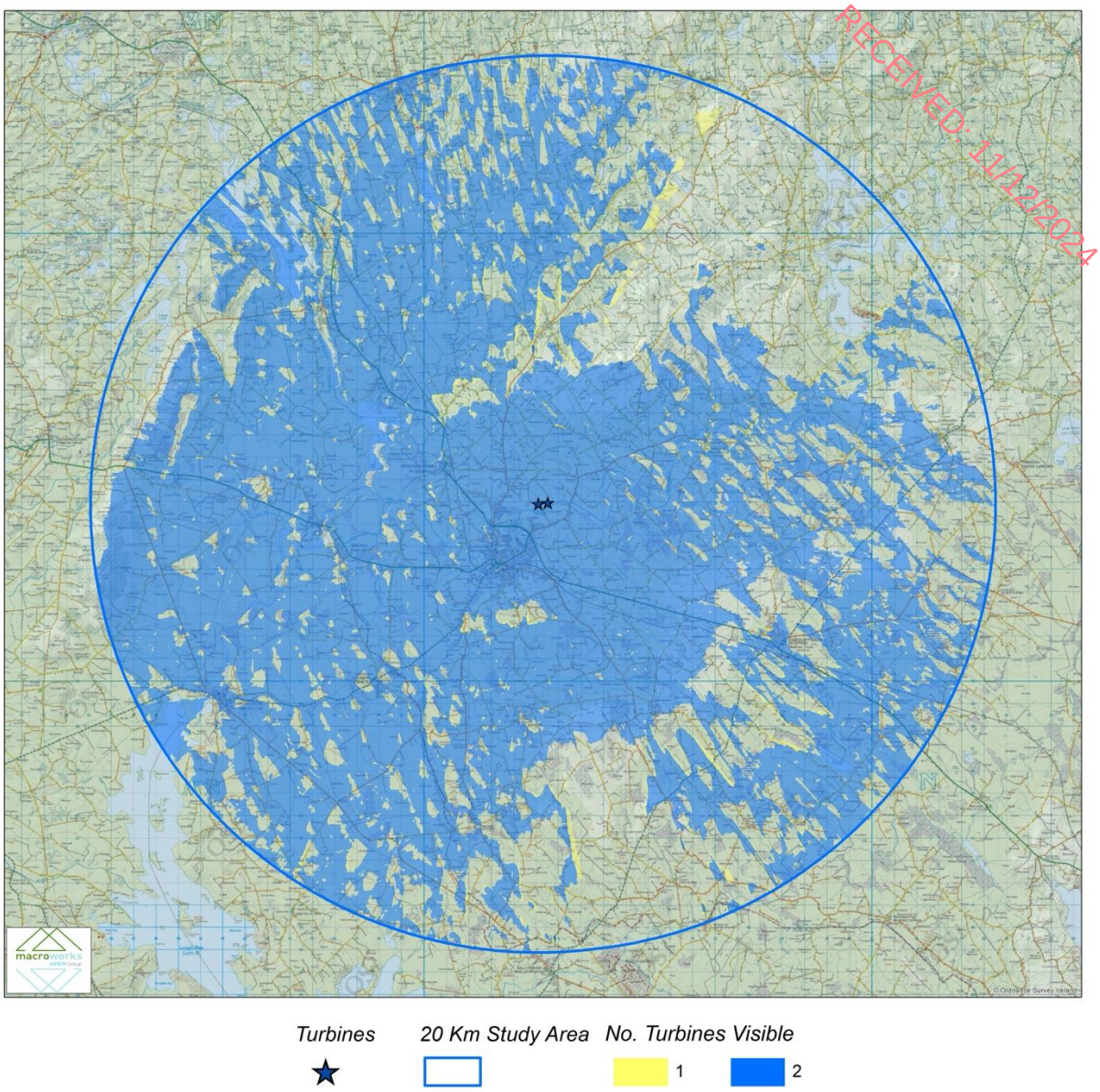

Figure 5.6 Bare-ground Zone of Theoretically Visibility (ZTV) Map based on a turbine tip height of 199.9m. (See Appendix 5.2 for larger scale map)

The following key points are illustrated by the 'bare-ground' ZTV map

- Due to the uniform nature of the central study area, there is a correspondingly uniform degree of theoretic visibility within the central and much of the wider study area. There is a higher proportion of potential visibility to the west of the study area, while the northeast, east and southeast features the largest contiguous areas of no potential visibility.
- Across the study area, there is only very small section of visibility where one turbine will be viewed in isolation, these are at the periphery of the areas of 'no visibility' to the northeast and southeast of the study area.
- Due to the rolling nature of the drumlin hills within the study area, the ZTV presents with a 'sand-ripple' like effect, where visibility is eliminated within the inter-drumlin

hollows. This occurs extensively to the west, southwest northwest and southeast of the study area between 5-20km distance from the site.

- Overall, there is approximately 64% of the study area that experience potential visibility of the proposed development, while 36% has no potential for visibility. These areas of no visibility are small areas scattered between the drumlins, as well as more extensive areas to the northwest, near Grange Lough, Kilglass Lough, and southwards, tracing the western periphery of the study area to Slieve Bawn.
- Across the east of the study area, the drumlin ripple pattern is broken up with a higher proportion of no visibility. To the southeast of the study area, c.12km south of the site to 20km, including sections of the Royal Canal, there is no potential for visibility. Similarly, to the northeast of the study area the rolling hills in the northeast of Co. Longford feature dispersed visibility, while the far northern side of these hills and the distant Lough Gamba feature little to no potential for visibility.

5.6.5.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guide books, road side rest stops or on post cards that represent the area.

All of the scenic routes and views in Longford, Leitrim, and Roscommon that fall inside the ZTV pattern are included below. Co. Cavan and Co. Westmeath do not have any designated views within the study area.

5.6.5.2.1 Longford County Development Plan (2021-2028)

Volume 2 Appendix 9 of the Longford County Development Plan includes a map with a range of 'Views, Prospects and Scenic Routes'. These views are broken down into two groups; full views and intermittent views, and are described in Table 14.2 (full scenic routes) and 14.3 (intermittent scenic routes) of the CDP. Table 5.7 below provides a rationale for selection of relevant designated scenic views from the Longford County Development Plan.

Table 5.7 Rationale for selecting relevant scenic designations from Longford County Development Plan

Scenic View or Route Reference (CDP):	Relevance to visual impact appraisal?	Represented herein by VRP No.
F.S-1	Yes - Intermittent visibility in ZTV, likely further limited by vegetation. Directed towards site.	VP5
F.S-2	Yes – Within ZTV and directed towards site	VP12
F.S-3	Yes – Partial visibility and partially directed to site.	VP12
F.S-4	Not relevant – Outside of ZTV and not directed at site.	N/A
F.S-5	Not relevant – Very marginal ZTV, likely screened by vegetation. Nearest VP5.	N/A
F.S-6	Yes – Partial visibility and partially directed to site. Represented by VP8 at F.S-8	VP8
F.S-7	Not relevant – Outside of ZTV and not directed at site. Nearest VP8 – Primary amenity of route directed away from site, towards lakes	N/A

F.S-8	Marginal – Partial ZTV and not directed at site. Only southern section of route is within ZTV or directed towards the site.	VP8
F.S-9	Not relevant – Outside of ZTV and not directed at site	N/A
F.S-10	Not relevant – Outside of ZTV and not directed at site	N/A
F.S-11	Not relevant - View directed towards site, but fully screened by terrain and vegetation. Nearest VP8	N/A
F.S-12	Not relevant - View directed towards site, but fully screened by terrain and vegetation. Nearest VP8	N/A
F.S-13	Yes relevant – views directed towards site and partial visibility	VP8 & VP10
F.S-14	Yes relevant - Representative view will be taken from Granard Motte and Bailey. Representing heritage feature, scenic route, and population centre	VP10
F.S-15	Not relevant – Outside of study area	N/A
F.S-16	Not relevant – not directed towards site, partial ZTV.	VP10
F.S-17	Yes – Within ZTV and directed towards site	VP26
F.S-18	Marginal – Scenic route generally very enclosed by residences and vegetation. Representative view to be taken at gateway.	VP27
F.S-19	Not relevant – Outside of study area	N/A
F.S-20	Not relevant – Outside of study area	N/A
F.S-21	Not relevant – Outside of study area	N/A
F.S-22	Scenic amenity is confined to small section of main street, within highly vegetated surroundings with limited views to wider landscape. However there is one small section near the church where visibility is possible to the wider landscape. Please note, this location is F.S-22 on Protected Views Map in Appendix 9, however numbered F.S-23 in Table 14.2 of Volume 1 of Longford 2021-2027 CDP.	VP25
F.S-23	Not relevant – Outside of study area Please note point re: F.S-22 and cross reference error in CDP, this location is not shown on Protected Views Map in Appendix 9, however numbered F.S-23 in Table 14.2 of Volume 1 of Longford 2021-2027 CDP	N/A
I.S-1	Marginal - Highly enclosed by vegetation with marginal visibility to site. Represented by surrounding VPs	VP2 & VP5
I.S-2	Not relevant – Outside of study area	N/A
I.S-3	Marginal – Directed towards site, however there is limited visibility and high potential for roadside vegetation screening	VP2
I.S-4	Not relevant – Not within ZTV, not oriented towards site.	N/A
I.S-5	Not relevant – Not within ZTV, not oriented towards site.	N/A
I.S-6	Not relevant – Not within ZTV, not oriented towards site.	N/A
I.S-7	Not relevant – Not within ZTV, not oriented towards site.	N/A
I.S-8	Yes – Within ZTV and directed towards site	VP5, VP7, VP8
I.S-9	Yes – Within ZTV and directed towards site	VP5, VP7, VP8
I.S-10	Marginal – Partial ZTV. Represented by views on surrounding 'Full' scenic routes	VP5, VP7, VP8
I.S-11	Yes – Within ZTV and directed towards site	VP5, VP7, VP8
I.S-12	Yes – Partially oriented towards site, within ZTV.	VP21

I.S-13	Marginal – Partial ZTV. Represented by views on surrounding 'Full' scenic routes	VP25 & VP26
I.S-14	Not relevant – Outside of study area	N/A
I.S-15	Not relevant – Outside of study area	N/A
I.S-16	Not relevant – Outside of study area	N/A
I.S-17	Not relevant – Outside of study area	N/A
I.S-18	Not relevant – Marginally within study area, no potential visibility.	N/A

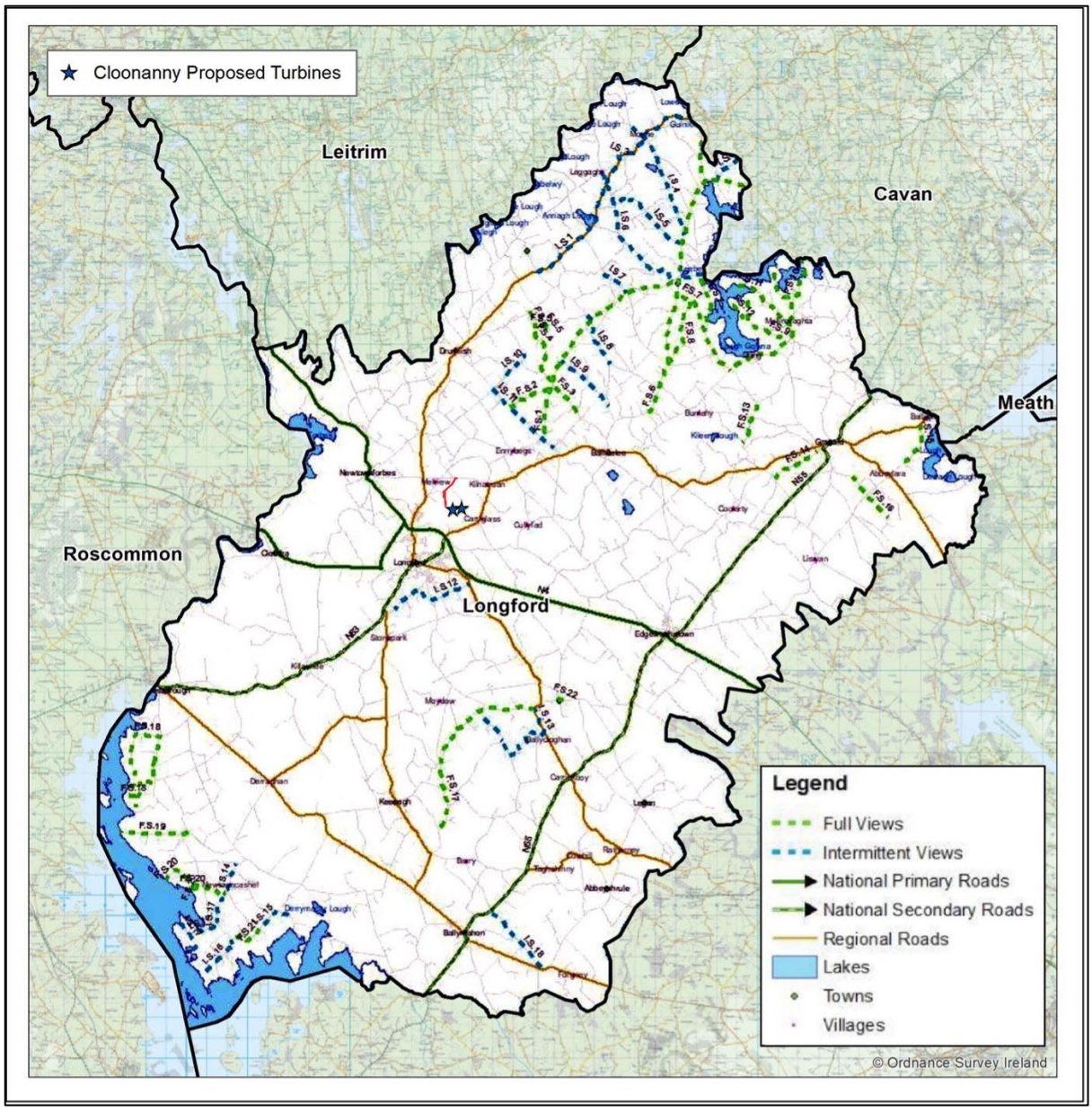

Figure 5.7 Volume 2 Appendix 9 of the Longford County Development Plan showing full and intermittent views in relation to the Proposed Development.

Policy in relation to scenic designations includes the following;

'CPO14.8-Preserve views and prospects as illustrated on the accompanying map as part of Appendix 9: Landscape Character and as listed in Tables 14.2 and 14.3.'

'CPO14.37-Preserve the views and prospects listed in Table 14.2 and 14.3 and detailed in Appendix 9: Landscape Character with accompanying maps and to protect these views from development which would interfere unduly with the character and visual amenity of the landscape.'

5.6.5.3 Roscommon County Development Plan (2022 – 2028)

Appendix 1 Figure 10 of the Roscommon landscape character assessment includes outlining designated scenic views and routes in County Roscommon (Figure 5.8 refers). Table 5.8 below provides a rationale for selection of relevant designated scenic views and routes from the Roscommon landscape character assessment.

Table 5.8 Rationale for selecting relevant scenic designations from Roscommon County Development Plan

Scenic View or Route Reference (CDP):	Relevance to visual impact appraisal?	Represented herein by VRP No.
R5	Not relevant – Directed away from the site with no potential visibility	N/A
R6	Not relevant – Directed away from the site with no potential visibility	N/A
R7	Marginal – Directed away from site, limited visibility.	VP24 & VP27

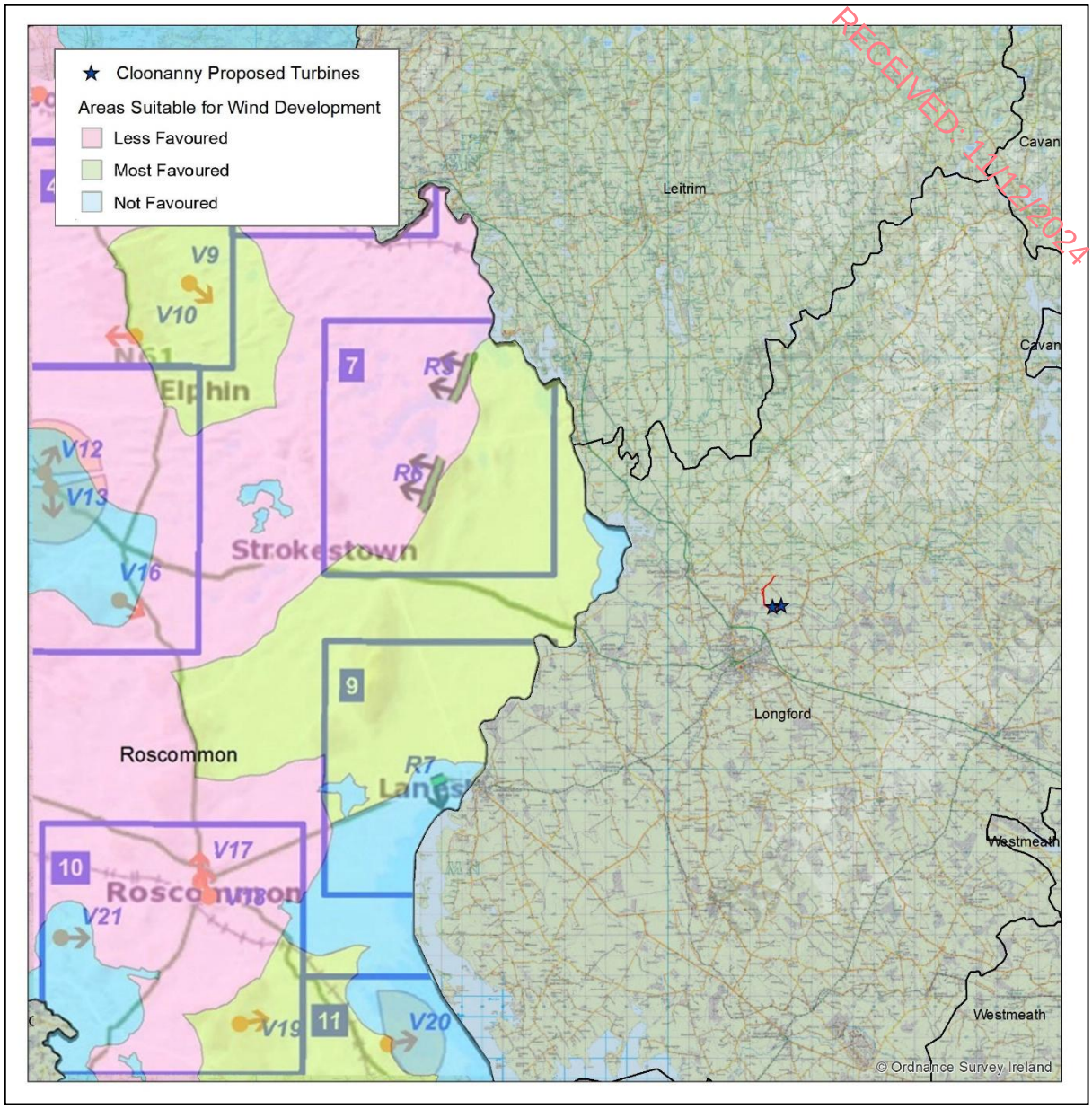

Figure 5.8 Appendix 1 Figure 10 of the Roscommon Landscape Character Assessment showing designated scenic views and routes in relation to the Proposed Development.

Policy in relation to designated scenic views and prospects includes the following:

> *'NH10.26- Protect important views and prospects in the rural landscape and visual linkage between established landmarks, landscape features and views in urban areas.'*

5.6.5.4 Leitrim County Development Plan (2023-2029)

Chapter 11 and Appendix 14 of the Leitrim County Development Plan contains a list of protected views and prospects and the locations of these are indicated on Figure 5.1 in Appendix 14. An excerpt from this map is included in Figure 5.9, below:

Table 5.9 Rationale for selecting relevant scenic designations from Leitrim County Development Plan

Scenic View or Route Reference (CDP):	Relevance to visual impact appraisal?	Represented herein by VRP No.
V26	Marginal – directed away from the site with limited visibility. High level of vegetation screening present.	VP1

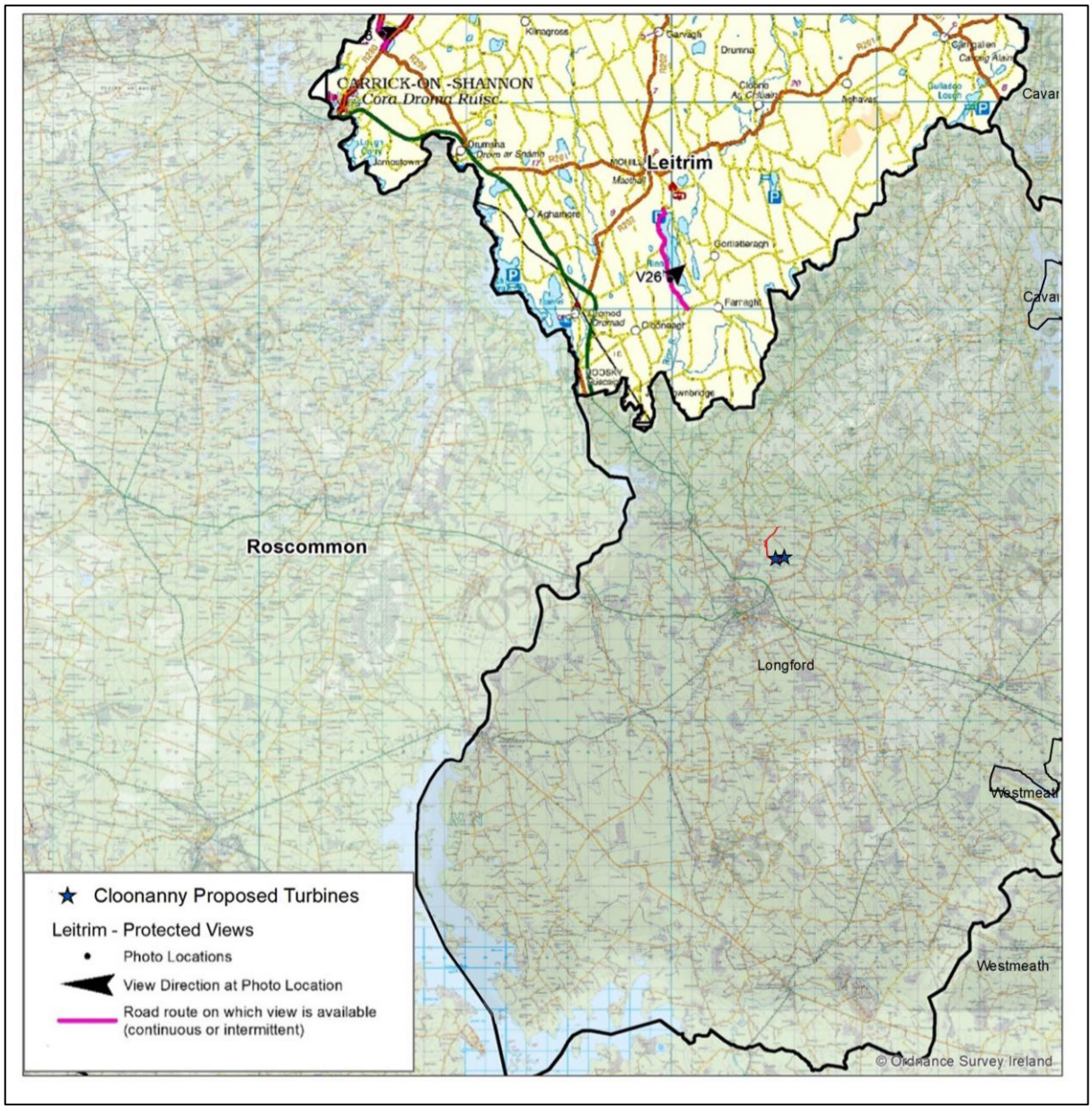

Figure 5.9 Appendix 14 Figure 5.1 of the Leitrim County Development Plan showing protected views and prospects

Policy in relation to designated scenic views and prospects includes the following:

'LD POL 1- To safeguard the protected views and prospects contained in Table 11.8 and identified on Map No. 12 (Volume III - Book of Maps) from intrusive development which would interfere unduly with the character and visual amenity of the landscape.

LD POL 2- To protect Areas of Outstanding Beauty and Areas of High Visual Amenity from inappropriate development and reinforce their character, distinctiveness and sense of place.

LD POL 3-To permit development in an Area of High Visual Amenity only where the applicant has demonstrated a very high standard of site selection, site layout and design and where the Planning Authority is satisfied that the development could not be accommodated in a less-sensitive location.

LD POL 4- To require that a landscape and visual impact assessment, prepared by a suitably qualified professional, be submitted with planning applications for development which may have an impact on the landscape character of the area.

LD POL 5- To ensure that development proposals have regard to the Landscape Character Assessment, the value of the landscape, its character, importance, sensitivity and capacity to absorb change.

LD POL 6- To protect lakeshores from inappropriate development which would detract from the natural amenity of the area.

LD POL 7- To permit development in an Area of Outstanding Natural Beauty where the applicant can satisfy the Planning Authority that it is not practicable to develop in a less sensitive location and where it is demonstrated that the development will not impinge in any significant way on the character, integrity or uniformity of the landscape.'

Objectives in relation to designated scenic views and prospects includes the following:

'LD OBJ 1- To protect the quality, character and distinctiveness of the landscapes of the county.

LD OBJ 2- To provide and maintain facilities, including viewing areas, lay-bys, safe pedestrian access and/or car parking, and where appropriate, associated seats and signs in the immediate vicinity of views that are identified in this Plan and as funds allow.

LD OBJ 3- To undertake and adopt a landscape capacity assessment of the county for commercial afforestation.

LD OBJ 4- To protect Areas of Outstanding Natural Beauty and Areas of High Visual Amenity from inappropriate forms of development. These areas are identified in Table 11.6 and Table 11.7 of this Plan and shown graphically on Map No. 11 'Landscape Designations' in Volume III (Book of Maps).'

5.6.5.5 Centres of Population

The nearest and most notable centre of population in relation to the proposed development is the settlement of Longford, which is situated some c. 3km southeast of the site. Aside from Longford, the central study area is evenly populated with clusters of residences and lifestyle properties serviced by Longford. The nearest of these to the site are Clonbalt Wood (1.4km west) and Melview (1.3km north). The settlement pattern within the remaining 3-5km of the central study area is principally composed of isolated rural dwellings and farmsteads, small linear clusters of development and small cross-road settlements. There is a higher degree of built form to the south of the site than the north.

Beyond the central study area, the rural settlement pattern tends to increase to the south, with a number of small to medium-sized towns and villages. The largest include Edgeworthstown (10km southeast) and Lanesborough (16km southwest), while smaller villages and cross-road settlements are Termonbarry (10km west), Ardagh Village (10km south), Keenagh (15km south). To the north of the study area is the medium-sized settlement of Roosky, 12km northwest of the site along the Shannon, as is Drumond (14km northwest). Drumlish (7km north), Newtown Forbes (4km west), Ballinalee (7km east), Aughnacliffe (15km northeast) and Granard (17km northeast) are the main population centres in Co. Longford to the north of the site and wider study area. Between these, the settlement pattern comprises a small village and cross-road clusters, with denser concentrations of residences around loughs and the Royal Canal.

5.6.5.6 Transport Routes

The nearest and most notable major transport route in relation to the proposed development is the N4 regional road, which traverses the central and wider study area, following the Shannon Corridor from the north into Longford, before veering east to exit via Edgeworthstown, 1km south of the proposed development at its nearest point. In Longford Town, the N5 (1.7km west) and N63 (1.2km south) diverge to the west, crossing the Shannon at Termonbarry and Lanesborough. In the east of the study area, the N55 runs northeast to southwest from Granard, crossing the N4 at Edgeworthstown to continue out of the study area, 11.5km east of the site at its nearest point. A number of regional roads diverge from Longford, with the R194 located c.1km south and east of the site, while the R198 is located at a similar distance to the north and west. The R393 and R397 diverge to the south of Longford. Otherwise, the study area comprises a network of local roads that wind through the drumlins and multiple loughs to the north, while the Shannon and large areas of bog in the southern study area confine most transport to the major routes.

Other modes of transport include the Royal Canal and the Irish railway network, served by Sligo-Dublin intercity services. The Royal Canal is confined to the western and southern study area, while the rail line generally follows the path of the N4 between the north and east of the study area – via Longford Town.

5.6.5.7 Tourism, Recreation and Heritage Features

The River Shannon is popular for fishing and boating, and there are local walks around parts of the shoreline. The River Shannon runs approximately 6 km to the west of the site before it veers away again to the southwest. There are a number of harbours and walkways along the Shannon and Royal Canal across the study area. These typically intersect or occur at population centres, such as

Termonbarry, Cloondara, and Mosstown. The Royal Canal Way follows the towpath across the south of the study area. Smaller recreation features include Cairn Hill Walking Trail, 8km to the north, Leebeen Park and Aughnacliffe Waterfall Trails, 14km to the north.

In the north and central study area, demesne landscapes add heritage character, despite the varying states of disrepair – such as Carrickglass, 1km to the east of the site, Castleforbes, 4km to the east on the Shannon, and Ardagh Demesne 10km to the southeast. Rinn Lough in particular features a cluster of heritage and recreational features, with Lough Rynn Castle and Walled Garden on the northern shore, while a number of smaller trails occur in the wider Lough surrounds. Lough Gowna is similarly developed, including Inchmore Island, which hosts the ruin of Inchmore Abbey.

The towns and villages across the study area are well equipped with heritage sites and structures, such as Granard Motte and Bailey, St. Patrick's Church in Ardagh Village, while Longford Town features St Mel's Cathedral, St Mel's College, The Mill Bridge, and a walking trail along the Camlin River.

The Corlea Trackway is an ancient trackway of oak planks that allowed passage for Iron Age inhabitants of this southern study area through the bog. A significant visitor centre has been erected around the exposed trackway by the Office of Public Works and hosts a variety of exhibits and audio-visual displays relating to the way of life at the time in which the trackway was constructed (148 BC). The Corlea Trackway visitor centre is approximately 16 km to the south of the Proposed Development.

5.6.5.8 Identification of Viewshed Reference Points as a Basis for Assessment

The results of the ZTV analysis provide a basis for the selection of Viewshed Reference Points (VRP's), which are the locations used to study the landscape and visual impact of the proposed wind farm in detail. It is not warranted to include each and every location that provides a view of this development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the project. Instead, a variety of receptor locations was selected that are likely to provide views of the proposed wind farm from different distances, different angles and different contexts.

The visual impact of a proposed development is assessed using up to 6 categories of receptor type as listed below:

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR); and
- Amenity and heritage features (AH).

Where a VRP might have been initially selected for more than one reason it will be assessed according to the primary criterion for which it was chosen. The characteristics of each receptor type vary as does the way in which the view is experienced. These are described below.

5.6.5.8.1 Key Views

These VRPs are at features or locations that are significant at the national or even international level, typically in terms of heritage, recreation or tourism. They are locations that attract a significant

number of viewers who are likely to be in a reflective or recreational frame of mind, possibly increasing their appreciation of the landscape around them. The location of this receptor type is usually quite specific.

5.6.5.8.2 Designated Scenic Routes and Views

Due to their identification in the County Development Plan this type of VRP location represents a general policy consensus on locations of high scenic value within the Study Area. These are commonly elevated, long distance, panoramic views and may or may not be mapped from precise locations. They are more likely to be experienced by static viewers who seek out or stop to take in such vistas.

5.6.5.8.3 Local Community Views

This type of VRP represents those people who live and/or work in the locality of the proposed EIA Development, usually within a 5km radius of the site. Although the VRPs are generally located on local level roads, they also represent similar views that may be available from adjacent houses. The precise location of this VRP type is not critical; however, clear elevated views are preferred, particularly when closely associated with a cluster of houses and representing their primary views. Coverage of a range of viewing angles using several VRPs is necessary in order to sample the spectrum of views that would be available from surrounding dwellings.

5.6.5.8.4 Centres of Population

VRPs are selected at centres of population primarily due to the number of viewers that are likely to experience that view. The relevance of the settlement is based on the significance of its size in terms of the Study Area or its proximity to the site. The VRP may be selected from any location within the public domain that provides a clear view either within the settlement or in close proximity to it.

5.6.5.8.5 Major Routes

These include national and regional level roads and rail lines and are relevant VRP locations due to the number of viewers potentially impacted by the proposed development. The precise location of this category of VRP is not critical and might be chosen anywhere along the route that provides clear views towards the Site, but with a preference towards close and/or elevated views. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

5.6.5.8.6 Tourism, Recreational and Heritage Features

These views are often one and the same given that heritage locations can be important tourist and visitor destinations and amenity areas or walking routes are commonly designed to incorporate heritage features. Such locations or routes tend to be sensitive to development within the landscape as viewers are likely to be in a receptive frame of mind with respect to the landscape around them. The sensitivity of this type of visual receptor is strongly related to the number of visitors they might attract and, in the case of heritage features, whether these are discerning experts or lay tourists. Sensitivity is also heavily influenced by the experience of the viewer at a heritage site as distinct from simply the view of it. This is a complex phenomenon that is likely to be different for every site. Experiential considerations might relate to the sequential approach to a castle from the car park or the view from a hilltop monument reached after a demanding climb. It might also relate to the influence of contemporary features within a key view and whether these detract from a sense of past

times. It must also be noted that the sensitivity rating attributed to a heritage feature for the purposes of a landscape and visual assessment is not synonymous with its importance to the Archaeological or Architectural Heritage record.

The Viewshed Reference Points selected in this instance are set out in **Table 5.10** below and shown on the VP selection Map in the Photomontage Booklet.

Table 5.10 Outline description of selected Viewshed Reference Points (See Figure 5.10)

VRP No.	Location	Distance to nearest turbine	Representative of	Direction of view
VP1	Rinn Lough	17.4 km (T1)	AH, SV, LCV	S
VP2	R198 at Legga	18.6 km (T2)	SV, MR, LCV	S
VP3	N4 viewpoint at Fearnaght	18.5 km (T1)	MR, AH, LCV	S
VP4	R198 at Drumlish	6.8 km (T2)	MR, CP	S
VP5	L1035 at Drumderg	10.3 km (T2)	SV, LCV	SW
VP6	R371 at Osprey Park	12.1 km (T1)	MR, CP	SE
VP7	L1031 at Corn Hill	6.9 km (T2)	SV, LCV	SW
VP8	L1051 at Gelsagh	11.1 km (T2)	SV, LCV	SW
VP9	N4 at Newtown Forbes	4.5 km (T1)	CP, MR	E
VP10	Granard Motte and Bailey	17.7 km (T2)	SV, AH, CP	W
VP11	L50461 at Derryharrow	0.9 km (T1)	LCV	S
VP12	L1018 at Melview	1.5 km (T1)	LCV	E
VP13	R198 west of site	1.6 km (T1)	LCV, MR	E
VP14	Lane at Kiltybegs	1.0 km (T2)	LCV	W
VP15	Termonbarry Lock	9.8 km (T1)	AH, CP	E
VP16	R194 at Carrickglass Demesne - LCC requested view	1.0 km (T2)	MR, AH, LCV	W
VP17	N4 at Camlin River, Longford	1.5 km (T1)	MR, CP	N
VP18	R198 at Abbeycarton, Longford – AHA – LCC Requested View	2.6 km (T1)	CP	N
VP19	L1071 at Corrabaun, Longford	2.1 km (T2)	LCV	N
VP20	St Mel's Cathedral, Longford - LCC requested view	3.1 km (T1)	CP, MR, AH,	N
VP21	L1127 at Aghafad, Longford	4.4 km (T1)	SV (R) , CP	N
VP22	N4 at Edgeworthstown	10.3 km (T2)	MR, CP	NW
VP23	N63 at Royal Canal	9.7 km (T1)	MR, AH	NE
VP24	Harbour Lane, Ballyleague	16.7 km (T1)	CP, AH,	NE
VP25	St Patrick's Church, Ardagh Village	10.5 km (T2)	SV, CP, AH,	N
VP26	L5209 at Lisduff	10.1 km (T2)	SV, LCV	N
VP27	L1167 at Carrowroe	18.7 km (T1)	SV	NE
VP28	L1136 at Mosstown Harbour	15.0 km (T1)	AH	N
VP29	Clonbalt Wood	1.5 km (T1)	LCV	E

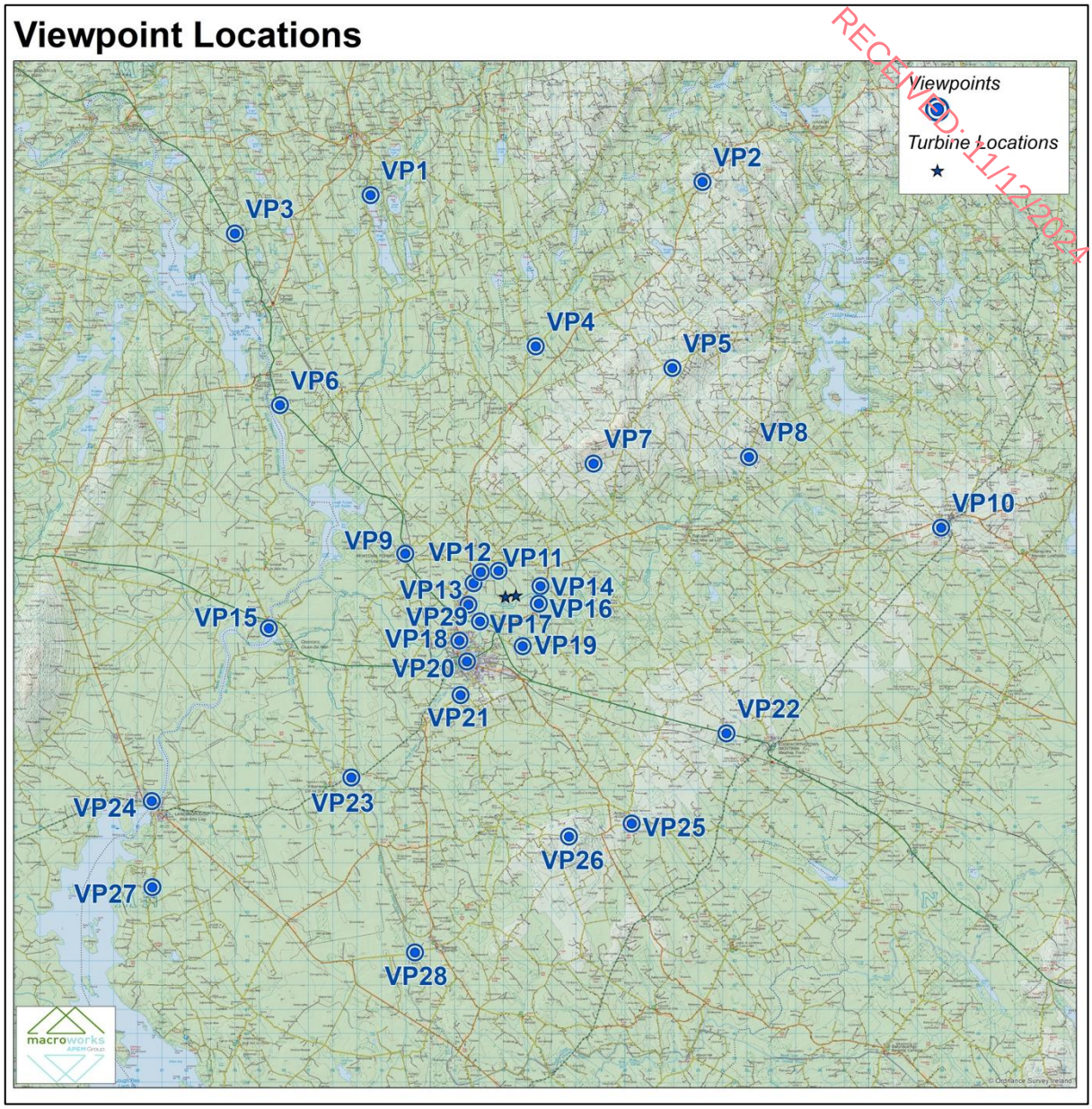

Figure 5.10 Viewpoint Map

5.6.6 Cumulative Baseline

The SNH Guidelines relating to the Cumulative Effects of Wind Farms (2005) and GLVIA - 2013 identify that cumulative impacts on visual amenity consist of combined visibility and sequential effects. The same categories have also been subsequently adopted in the Landscape Institute's 2013 revision of the Landscape and Visual Impact Assessment Guidelines:

> *"Combined visibility occurs where the observer is able to see two or more developments from one viewpoint. Combined visibility may either be in combination (where several windfarms are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the various windfarms).*

Sequential effects occur when the observer has to move to another viewpoint to see different developments. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints.)"

Based on guidance contained within the SNH Guidelines relating to the Cumulative Effects of Wind Farms (2005) and the DoEHLG Wind Energy Guidelines (2006/2019 revision), cumulative impacts can be experienced in a variety of ways.

In terms of landscape character, additional wind energy developments might contribute to an increasing sense of proliferation. A new windfarm might also contribute to a sense of being surrounded by turbines with little relief from the view of them. The term 'skylining' is used in the SNH Guidelines to describe the effect:

"Where an existing windfarm is already prominent on a skyline the introduction of additional structures along the horizon may result in development that is proportionally dominant. The proportion of developed to non-developed skyline is therefore an important landscape consideration."

In terms of visual amenity, there is a range of ways in which an additional windfarm might generate visual conflict and disharmony in relation to other wind energy developments. Some of the most common include visual tension caused by disparate extent, scale or layout of neighbouring developments. A sense of visual ambivalence might also be caused by adjacent developments traversing different landscape types. Turbines from a proposed windfarm that are seen stacked in perspective against the turbines of nearer or further developments tend to cause visual clutter and confusion. Such effects are exacerbated when, for example, the more distant turbines are larger than the nearer ones and the sense of distance is distorted. Table 5.11 below provides criteria for assessing the magnitude of cumulative impacts

Table 5.11 Magnitude of Cumulative Impact

Magnitude	Description
Very High	The proposed windfarm will strongly contribute to wind energy development being the defining element of the surrounding landscape. It will strongly contribute to a sense of windfarm proliferation and being surrounded by wind energy development. Strongly adverse visual effects will be generated by the proposed turbines in relation to other turbines.
High	The proposed windfarm will contribute significantly to wind energy development being a defining element of the surrounding landscape. It will significantly contribute to a sense of windfarm proliferation and being surrounded by wind energy development. Significant adverse visual effects will be generated by the proposed turbines in relation to other turbines

Medium	The proposed windfarm will contribute to wind energy development being a characteristic element of the surrounding landscape. It will contribute to a sense of windfarm accumulation and dissemination within the surrounding landscape. Adverse visual effects might be generated by the proposed turbines in relation to other turbines.
Low	The proposed windfarm will be one of only a few windfarms in the surrounding area and will be viewed in isolation from most receptors. It might contribute to windfarm development becoming a familiar feature within the surrounding landscape. The design characteristics of the proposed windfarm accord with other schemes within the surrounding landscape and adverse visual effects are not likely to occur in relation to these.
Negligible	The proposed windfarm will most often be viewed in isolation or occasionally in conjunction with other distant wind energy developments. Wind energy development will remain an uncommon landscape feature in the surrounding landscape. No adverse visual effects will be generated by the proposed turbines in relation to other turbines.

Within the Study Area there is 1 existing wind farm, 1 consented wind farm development and 1 wind farm development in pre-planning. The cumulative developments are set out below and identified in Figure **5.11** below.

Table 5.12 Cumulative Wind Farms within the Study Area (See Figure 5.11)

Wind Farm	Status	No. of Turbines	Approximate Distance & Direction
Sliabh Bawn	Existing	19	19km West
Lissanore	Permitted	1	13km East
Derryadd (2024)	Proposed (Pre-planning)	22	12.5km Southwest

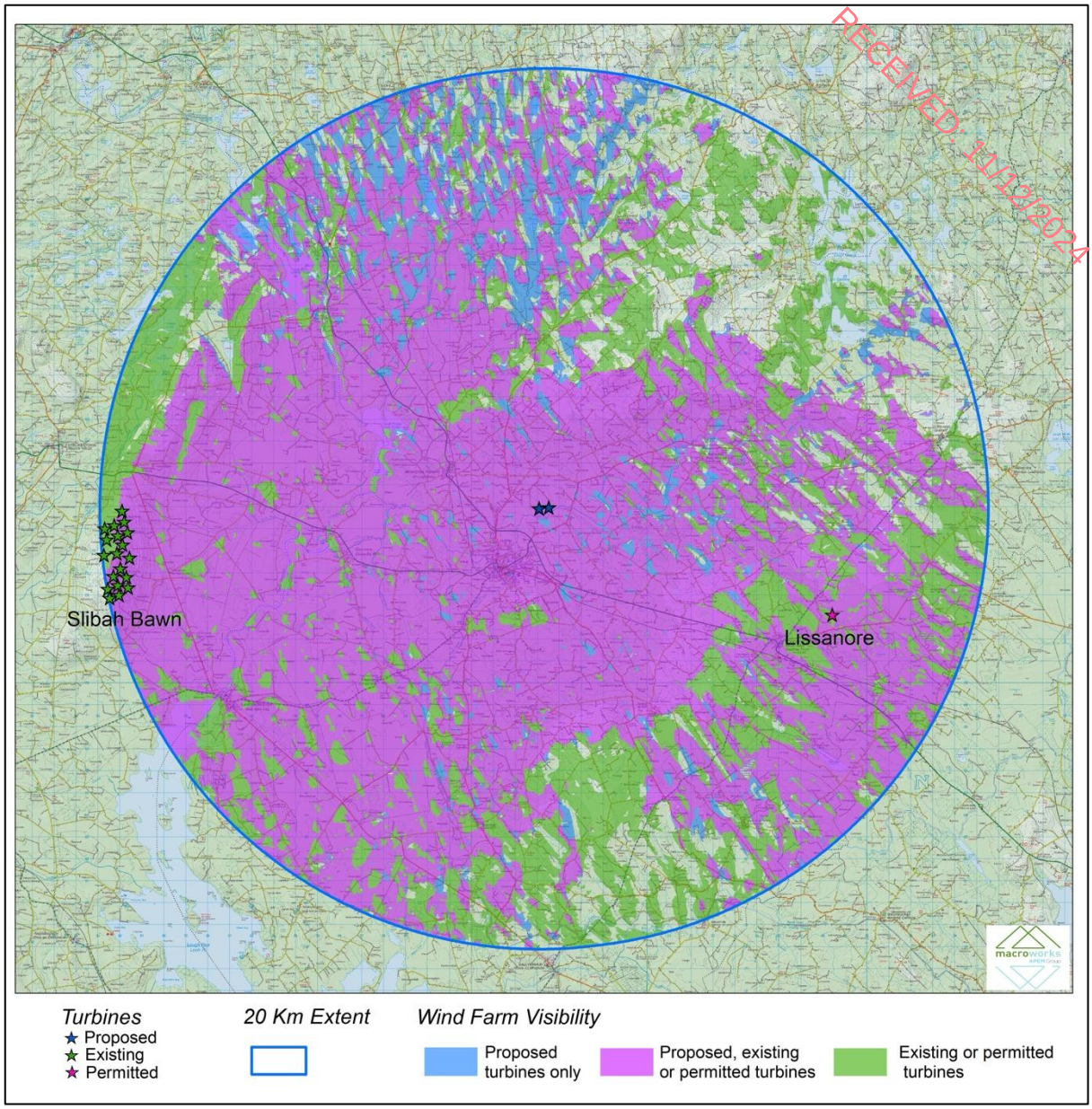

Figure 5.11 Cumulative Baseline

5.6.7 Landscape Character, Value and Sensitivity

Effects on landscape character will be considered at both the localised scale of the site and its immediately surrounding landscape in the central portion of the study area (<5 km), as well as the broader scale of the wider study area (5-20 km).

5.6.7.1.1 Central Study Area (<5km)

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the proposed project site and wider Study Area.

The site and its immediate surroundings are predominantly pastoral farmland and have a productive and utilitarian character. There is a strong connection between the primary industries of this area and the settlement of Longford, which is the largest population centre of the study area, with pressure on the rural surrounds from residential development, as can be seen along the R198 and R194 to the east and west of the site. The central study area can be divided in character to the north and south of the N4 main corridor. The north of the N4, and in the immediate surrounds of the site, is a relatively uniform expanse of rolling rural characteristics, with a dense patchwork of fields bordered by tree-lined hedgerows. The landform slopes upwards to the northeast, with small rolling hills and valleys overlayed by pasture. The northeast and immediate east of the site features larger areas of woodland and forestry, breaking up the uniform farmland in response to the rolling landform. Carrickglass Demesne to the east of the site adds a degree of heritage and amenity value with the remnants of gate and wall structures set against established trees.

In contrast, to the southwest, the landscape character is more variable, with the population centre of Longford and Newtown Forbes, the transport corridors of the N4, Dublin Sligo Railway which sweep around the south and west of the central study area. The N5 and N63 diverge from Longford, further fragmenting the rural areas which border the south of Longford. While the Royal Canal, Castle Forbes Demesne and County Longford Golf Club add localised amenity, this section of the study area is a working landscape highly influenced by the developed centre of Longford. The landform slopes towards the Shannon Valley, and includes the periphery of larger areas of bog and cutaway peatland which border the central study area along the Shannon. In the transitional zones between sections of cutaway peatland and productive farmland there are transitional areas of untouched bog and scrubland as well as marginal farmland. Though not aesthetically distinctive these apparently fallow areas are often the subject of conservation based designations. Indeed, there are 5 no. NPWS designated areas within the central study area mainly relating to bogs and wetland features.

Overall, the central study area is typical of the Longford Landscape Character Assessment, listing agricultural pasture, urban fabric and mixed pockets of tree cover as the main land uses across "*relatively flat and low lying"* landform. Within the Longford CDP, the sensitivity of the landscapes in the central study area is *"generally LOW"* although there is *"Potential areas of MEDIUM to HIGH sensitivity exist in the vicinity of protected woodlands and riverbanks",* each of which occurs within the central study area. It is considered that the central study area is not particularly rare or distinctive in character and therefore deemed Medium-Low sensitivity, as while the north of the central study area is more cohesive, the dominant rural land use is not overly sensitive, with the exception of localised features such as the Camlin River and Carrickglass Demesne. In the southern central study area, the landscape character is fragmented with areas of higher sensitivity (e.g., Royal Canal, Castle Forbes Demesne) interspersed with utilitarian rural landscapes, which are highly influenced by Longford. The combination of these features results in the overall **Medium-Low** sensitivity.

5.6.7.1.2 Wider Study Area (>5km)

The wider study area is a continuation of the patterns in the central study area. The northern and eastern study areas transition up rolling upland areas and a multitude of loughs, while the southern and western study area is defined by the Shannon and wide areas of exploited and intact peatland. Notwithstanding the general utilitarian character of much of the agricultural and peatland across the study area, there are some distinctive elements and important landscape associations.

The River Shannon, the largest and longest river in the country, passes around 7km to the northwest of the site. Aside from being the principal divide between the east and west of Ireland, it has been an important waterway for millennia. The north-western extent of the Royal Canal, an important historic transport corridor and now a recreational feature, is located within the southern study area. The nearest point is the smaller Longford Branch, which is located 3.5km to the southwest of the site, travelling south to join the main canal, which passes 9km to the southeast of the site at its nearest point. It connects from the River Shannon to the north of the site, through the midlands, to Dublin. The other important landscape and heritage association for the central study area is the 'Corlea Trackway'. This is a section of an ancient oak plank track that would have provided access to or through the bog for the area's inhabitants in the Iron Age. It is one of the oldest such features to be found in Europe and has a dedicated visitor centre.

There is a lake-rich drumlin zone within the northern study area. This is an area of relatively distinctive character, where recreational and scenic value is attached to the lakes. However, vast drumlin areas occur between County Leitrim and County Cavan in this region, and this is not a particularly rare or susceptible landscape type. This is re-iterated by the pattern of scenic routes within Longford and the small number within the study area located within other counties. The majority are located across the rolling upland areas to the north of the study area or to the south, with views towards the Shannon and surrounding loughs, in particular Lough Ree.

Although the wider study area contains some notable landscape features, it is not considered to have a particularly rare or distinctive 'landscape image' or iconic associations. Like the central portion of the study area, the principal landscape values appear to relate to rural subsistence and productivity, and these values are not particularly susceptible to new forms of rural development. Overall, the landscape sensitivity of the wider study area is considered Medium. There are areas across the broad lowlands that are **Medium-low**, while other singular features are of High landscape sensitivity, such as along the Shannon Corridor and surrounding lakeshores.

5.7 Do Nothing Scenario

In this instance the do-nothing scenario would be that the receiving landscape stays in the same or similar condition as it currently is, managed for a combination pastoral farmland and under continued development pressure from Longford.

5.8 Assessment of Potential Effects

5.8.1 Landscape Impacts

The physical landscape, as well as the character of the proposed development and its central Study Area (<5km), is affected by the proposed wind turbines as well as ancillary development such as access and circulation roads, areas of hard standing for the turbines, grid connection and associated built form of the substation and Battery Energy Storage System (BESS) compound. While the turbines will be the structures with the greatest potential influence on the surrounding landscape character, the works and resulting structures of the substation and Battery Energy Storage System (BESS) are also

considered. By contrast, for the wider landscape of the Study Area, landscape impacts relate exclusively to the influence of the proposed turbines on landscape character.

5.8.2 Demolition Phase

Physical and characteristic impacts of the Demolition phase are limited to the demolition of a derelict structure and localised vegetation removal to provide for the delivery route. There will be areas of vegetation removed along existing and new track routes for turbine delivery. Site activity will be at its greatest during the demolition of the derelict structure and removal from site due to the operation of machinery on site and movement of heavy vehicles to and from site. Additioanlly, the removal of existing hedgerows will involve heavy machinery, but in a less concentrated manner, being distributed along the length of the section of hedgerow being removed. This phase will have a more significant impact on the character of the site than the operational phase, but it is a 'short-term' impact that will cease as soon as the site is cleared for the proposed access tracks and turbine delivery route.

There will be some long-term/permanent demolition stage effects in the removal of existing structures, and in the time period between hedgerow removal and reinstatement. Thus, the demolition stage landscape effects of the Development are deemed irreversible, with the exception of where hedgerows are re-instated in the same location as the removal.

Overall, the magnitude of demolition stage landscape effects within the site and its immediately surrounding context is deemed to be **Medium** and of a **Negative** quality, but of a **Temporary** duration. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the decommissioning related activities become a proportionately smaller component of the overall landscape fabric.

5.8.3 Construction Stage

It is considered that the proposed wind farm development will have a modest physical impact on the landscape within the site as none of the proposed development features have a large 'footprint', and land disturbance will be relatively limited. The topography and land cover of the proposed site will remain largely unaltered, with construction being limited to access tracks, turbine hardstands, the on-site substation, a temporary construction compound, and the proposed met mast and battery storage containers. Excavations will tie into existing ground levels and will be the minimum required for efficient working. Any temporary excavations or stockpiles of material will be re-graded to marry into existing site levels and reseeded appropriately in conjunction with advice from the project ecologist. Both turbines T1 and T2 are set within pasture, so vegetation clearance will be limited to sections of hedgerow within the assembly areas surrounding the turbines, where proposed access tracks cross field boundaries and where existing access tracks need to be widened to facilitate heavy machinery access.

The finalised internal Access Track layout has been designed to avoid environmental constraints, and every effort has been made to minimise the length of the necessary roadway by utilising and upgrading the existing site access track, however, there are sections of new track to be constructed for each turbine, both of which connect back into the existing track. Furthermore, the road layout has been designed to follow the natural contours of the land wherever possible reducing potential for areas of

excessive 'cut and fill'. There will be an intensity of construction stage activity associated with the Access Tracks and Turbine Hardstands consisting of the movement of heavy machinery and materials, but this will be temporary/short term in duration and transient in location. The construction stage effects on landscape character from these activities will be minor. There are a number of areas where widening or additional vehicle tracking areas are proposed to be constructed for the delivery of abnormal loads, however these are to be grubbed up and ground reinstated on completion of final delivery.

There will be one 20kV on-site substation compound constructed to provide a connection to the national grid via an underground 20kV transmission cable connection. The on-site substation will be located to the south of the local road that traverses northwest of the site and at the junction of the access track. The substation compound will be constructed from engineered stone material using construction techniques similar to those of the crane hardstands. A 2.65m high fence will enclose the overall compound and will contain two single-storey modular buildings constructed of pre-fabricated steel panels, 3.5m in height from ground level to the ridge level, as well as battery units, inverters and transformers. The most notable construction stage landscape impacts resulting from the proposed on-site substation relate to the minor levelling of the site to form a level platform and the construction of the compound base.

All internal site cabling will be underground and will follow site Access Tracks without the need for trenching through open ground. Indeed, the land cover of the site will only be interrupted as necessary to build the structures of the proposed wind farm and to provide access. Impacts from land disturbance and vegetation loss at the site are considered to be modest in the context of this rural landscape setting that is influenced by an array of working rural land uses and more intensive development surrounding Longford.

A permanent meteorological (Met) mast will be erected on-site to the south of the substation compound. It will comprise of a 32m high lattice steel mast with a shallow concrete foundation. Furthermore, two battery storage containers will also be constructed on-site and will be finished in a muted green tone to blend with the surrounding vegetation and will rise no higher than 3.05m above the existing ground levels. The most notable construction stage effects will relate to the minor amount of ground excavation required to facilitate the shallow foundations for the steel mast structure and the stripping of soil to accommodate the concrete plinths and gravel surrounding the battery storage containers.

Site activity will be at its greatest during the construction phase due to the operation of machinery on site and movement of heavy vehicles to and from site. This phase will have a more significant impact on the character of the site than the operational phase, but it is a 'short-term' impact that will cease as soon as the proposed development is constructed and becomes operational (approximately 24 months from the commencement of construction).

There will be some long-term/permanent construction stage effects on the physical landscape in the form of turbine foundations and hardstands, access tracks and a substation, but only the substation compound is likely to remain in perpetuity as part of the national grid network. It is likely, that with the exception of some residually useful access tracks, all other development features will be removed

from the Site and it will be reinstated / restored to the prevailing land cover. Thus, the construction stage landscape effects of the Development are largely reversible.

There will be some construction stage effects on landscape character generated by the intensity of construction activities (workers and heavy machinery) as well as areas of bare ground and stockpiling of materials as identified in the Construction and Environmental Management Plan (CEMP) (accompanies the planning application under separate cover). Such effects will be temporary/short-term in duration and are, therefore, not considered to be significant. Overall, construction stage landscape effects are considered to be of a **High-Medium** magnitude within 1km of the site, rapidly reducing to **Medium-Low** in the Central Study area (within 5km of the site) and **Low-negligible** across the wider study area.

5.8.4 Operational Stage Impacts

For most commercial wind energy developments, the greatest potential for landscape impacts to occur is as a result of the change in character of the immediate area due to the introduction of tall structures with moving components. Thus, wind turbines that may not have been a characteristic feature of the area become a new defining element of that landscape character. A secondary consideration of this development is the cluster of built forms that make up the substation and BESS compound.

In this instance, the proposed turbines will be a tall and distinctive component within a landscape which features a myriad of structures; however, none of this scale. The built form of Longford and the surrounding commercial areas add land-use intensity to the wider context; however, the level terrain and screening vegetation limit intervisibility. The pair of turbines will not be perceived to cover an extensive area of land or disrupt underlying rural land use in any material way, but they will extend the area of higher-intensity land use from Longford into the wider rural context. The offset from the main centre is in proportion to the height of the turbines and scale of the development – far enough that the change in land use scale is legible, with the buffer of some areas of pasture, while close enough that the energy infrastructure can be perceptually linked to the wider commercial and industrial land uses associated with a medium-large sized population centre – and the consumption of energy. Finally, while the proposed development is well assimilated into the wider landscape patterns, there is some contrast with the scattered residential properties which surround the site in terms of land use scale. Where visibility is possible above and behind these residences, the scale of the proposed turbines will be evident. The land-use intensification and scale of the turbines extend the influence of more industrial land uses around the outskirts of Longford. However, the impact on these residences and surrounding rural lifestyle settings is mitigated by the development being limited to a pair of turbines. Additionally, land use change and intensification can be expected within the transitional border of the main centre and is related to the proliferation of residences along the roads surrounding the site.

Ancillary development, including the access track, substation building, BESS compound, Met Mast, hardstanding area and cable trenching, will be of a similar scale to the aforementioned commercial land uses, with the buildings themselves smaller than surrounding agricultural or industrial buildings. In addition to the modest scale of the BESS and Substation, these areas are also likely to be well screened, with any removed hedgerows to be reinstated following construction, therefore providing

increased screening over the life of the project. Thus, it will not make a material contribution to landscape character effects relative to the proposed turbines.

For these reasons the magnitude of the landscape impact is deemed to be **Medium** within the site and its immediate environs (c.1km) reducing to **Medium-low** for the remainder of the central Study Area. The quality of the landscape effects is deemed **Negative**. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the wind farm becomes a proportionately smaller and integrated component of the overall landscape fabric.

5.8.5 Decommissioning

It is important to note that in terms of duration, this development proposal represents a long term, but not permanent impact on the landscape and is reversible. The lifespan of the project is 35 years, after which time it will be dismantled and the landscape reinstated to prevailing conditions. Within 2-3 years of decommissioning there will be little evidence that a wind farm ever existed on the site.

The decommissioning phase will have similar temporary impacts as the construction phase with the movement of large turbine components away from the site. There may be a minor loss of roadside and trackside vegetation that has grown during the operational phase of the project, but this can be reinstated upon completion of decommissioning. Areas of hard standing that are of no further use will be reinstated and reseeded to blend with the prevailing surrounding land cover of the time. It is expected that the decommissioning phase would be completed within a period of approximately 3 months.

Overall, the magnitude of decommissioning stage landscape effects within the site and its immediately surrounding context is deemed to be **Medium** and of a **Negative** quality, but of a **Temporary** duration. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the decommissioning related activities become a proportionately smaller component of the overall landscape fabric.

5.9 Visual Impact Assessment

5.9.1 Sensitivity of Visual Receptors

Visual sensitivity is a two-sided analysis of receptor susceptibility (people or groups of people) versus the value of the view on offer at a particular location. To assess the susceptibility of viewers and the amenity value of views, the assessor uses a range of criteria to analyse how strongly the viewer/view is associated with each of the criterion identified in Section 5.4.9 of this chapter.

5.9.1.1 Sensitivity of Designated Scenic Routes and Views (SR/SV);

Due to the varied and complex nature of the landscape within the study area, which comprises numerous notable landscape features, there are many scenic routes and scenic views within the 20km study extent. The most relevant scenic routes to the proposed development are those located nearest to it and which have the most potential to afford near and clear views of the proposed turbines. As

identified in the visual baseline, those relevant to the project are represented by VP1, VP2, VP5, VP7, VP8, VP10, VP21, VP25, VP26 and VP27. Many of these are also representative of other receptors; however, their primary purpose within this assessment and source of sensitivity is the scenic designation applied by the relevant County Development Plan.

Viewpoint 1 at Rinn Lough and Viewpoint 10 at Granard Motte and Bailey are both viewpoints where the sensitivity is deemed High. At both, there is a strong connection with the landscape, with the view across the Lough at VP1 and long-distance views from the elevated location of VP10. Combined with the historical value at VP10, the degree of perceived naturalness at VP1, the relatively popular and accessible nature of the sites, and the designation of these locations result in High sensitivity.

A different character of view is experienced at VP25, set within Ardagh Village. There is a higher number of viewers due to being located within a population centre, but a corresponding reduction in tranquillity and naturalness. This viewpoint also has a moderate association with Historical, Cultural, or Spiritual Value, located adjacent to Ardagh Demesne and St Patrick's Church. Therefore, the sensitivity is deemed High-medium.

The majority of the scenic designations within Co. Longford are routes located along public roadways; those to the north of the site are broad, slightly elevated views across a rolling rural context. These also represent the local community along these roads, which are the main receptors, with a uniform' sense of remoteness and/or tranquillity' typical of the rural surroundings. The primary significance of this assessment is the designation applied to them, as the views are not particularly rare or unique views featuring striking or noteworthy features. The only outlier is VP21, which features views across Longford and a mix of land uses. As such, VP2, VP5, VP7, VP8, VP21, VP26 and VP27 are deemed to be of Medium sensitivity.

5.9.1.2 Sensitivity of Local Community views (LCV);

Local Community views are considered to be those experienced by those people who live, work and move around the area within approximately 5km of the site. These are generally the people most likely to have their visual amenity affected by a wind energy proposal due to proximity to the turbines, a greater potential to view turbines in various directions, or having turbines as a familiar feature of their daily views. Within the study area, these include VP11, VP12, VP13, VP14, VP19, and VP29.

Viewpoints 11, 12, and 13 are located in the surroundings of Melview, to the northwest of the proposed turbines. Viewpoint 14 is located along a small lane of residences to the northeast of the proposed development, while VP19 is slightly separated to the south of the proposed development at the periphery of Longford. Finally, VP29 is located within Clonbalt Wood, which is a medium sized area of housing, separated from the main built area of Longford by the N4. The primary source of sensitivity at these locations is the number of viewers (in particular at VP11, VP12, VP13 and VP29) and the familiarity with the landscape. As such, these views associate represent a moderate association with the 'susceptibility of receptor group to changes in view' but less so with the 'values typically associated with visual amenity'.

Overall, the sensitivity of VP11, VP12, VP14, VP19, and VP29 is deemed Medium-Low.

5.9.1.3 Sensitivity of Centres of Population (CP);

Five viewpoints were chosen to represent centres of population within the central and wider study area (VP4, VP9, VP18, VP20, and VP24). Centres of the population are generally considered to be in the mid to low range of visual receptor sensitivity because they tend to be busy, built environments where visual change is relatively commonplace. Two views are located within Longford (VP18, VP20), both of which were included to address heritage features within the town. The other three views (VP4, VP9 and VP24) are located at smaller towns in the western study area, at Drumlish, Newtown Forbes and Ballyleage, respectively. There are higher sensitivity features in the surroundings of each of these views, the heritage features within Longford at VP18 (Longford Architectural Conservation Area), VP20 (St Mel's Cathedral) and the Shannon/Lough Ree context at VP24. Viewpoint 9 features less overt amenity, being set outside and facing away from the gates of Castleforbes Demense, and is primarily representative of local residents and users of the nearby N4.

On balance of the busy, built setting of these views with the various heritage and amenity features, the sensitivity is deemed to be Medium. The exception is Viewpoint 4, which is located along the R198 at the rural border of Drumlish, with a relatively enclosed view of a populated rural setting. As such, VP4 is deemed Medium-low.

5.9.1.4 Sensitivity of Major Routes (MR); and

These include national and regional level roads and rail lines and are relevant VRP locations due to the number of viewers potentially impacted by the proposed development. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

The densest concentration of major routes across the study area surrounds Longford; however, these diverge across the study area. The five viewpoints selected primarily to represent major routes are VP3, VP6, VP16, VP17, and VP22.

VP3 is located with wide views over Lough Bofin, with a number of residences in the immediate surroundings; VP16 was included to represent the heritage values of Carrickglass. Therefore, these two views are deemed Medium sensitivity. VP6 is located near the River Shannon and the population centre of Roosky. However, the location does not relate well to the river and is generally enclosed. VP17 is located between the proposed development and Longford, where the N4 crossed the Camlin River. Finally, VP22 is located at a slightly elevated section of the N4, west of Edgeworthstown. Overall, the remaining three viewpoints feature a high number of viewers but have limited amenity, resulting in a sensitivity of Medium-Low.

5.9.1.5 Sensitivity of Amenity and heritage features (AH).

A number of heritage and amenity features are included in the views addressed above, in particular within the scenic designations (VP1, VP10, VP25) and Centres of Population (VP18, VP20). The remaining views are focused along waterways. These include VP15 at Termonbarry Lock, VP23 where the N63 crosses the Royal Canal, and VP28 at Mosstown Harbour. Each of these has a moderate level of amenity and factors increasing viewer numbers or sensitivity. However, VP15 at Termonbarry features an adjacent population centre and the wider Shannon context and amenity values. As such,

the viewpoint sensitivity for VP15 is deemed High-Medium, while VP23 and VP28 are of Medium sensitivity.

5.9.2 Visual effects – Demolition Stage

During demolition, the main visual impacts will arise from heavy vehicles movements and worker vehicles travelling to and from the site and using the site entrance. This will be localised to a small area of the northern tip of the site. While a large part of this short-term activity will remain screened from the wider landscape by the hedgerows and mature conifer plantations that surround the site and its immediate landscape context, the adjacent roadways (L1011 and L5046) will have fleeting visibility. Furthermore, demolition-related activity is short-term in nature and will cease once the development becomes enters construction stage.

For these reasons, the magnitude of visual impact at the demolition stage is deemed to be no greater than **Medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low-negligible**. Combined with a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Moderate-slight** for those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances within the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the demolition stage.

5.9.3 Visual effects – Construction Stage

During construction, some of the most notable construction stage visual impacts will result from the erection of the proposed turbines using tower cranes. There will also be stockpiles of stripped topsoil as well as construction materials awaiting use. However, a large part of this short-term activity within the site will remain screened from view by the hedgerows and mature conifer plantations that surround the site and its immediate landscape context. Furthermore, construction-related activity is short-term in nature and will cease once the development becomes fully operational.

For these reasons, the magnitude of visual impact at the construction stage is deemed to be no greater than **High/High-medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low/Low-negligible**. Combined with a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Substantial-moderate** for those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Moderate/Moderate-Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances within the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the construction stage.

5.9.4 Visual effects – Operational Stage

In the interests of brevity and so that this chapter remains focussed on the outcome of the visual assessment (rather than a full documentation of it), the visual impact assessment at each of the 29 selected representative viewpoint locations has been placed into **Appendix 5.1**. This section should be read in conjunction with both **Appendix 5.1** and the associated photomontage set contained in a separate booklet. A summary table is provided below, which collates the assessment of visual impacts (**Table 5.13** below). A discussion of the results is provided thereafter.

Table 5.13 Outline description of selected Viewshed Reference Points (Figure 5.10)

VRP No.	Distance to nearest turbine	Visual receptor Sensitivity	Visual Impact Magnitude	Significance of effect
VP1	17.4 km (T1)	High	Low-negligible	Slight / Negative / Long term
VP2	18.6 km (T2)	Medium	Negligible	Imperceptible / Neutral / Long term
VP3	18.5 km (T1)	Medium	Low-negligible	Slight-imperceptible/ Negative / Long term
VP4	6.8 km (T2)	Medium-Low	Negligible	Imperceptible / Neutral / Long term
VP5	10.3 km (T2)	Medium	Low	Slight / Negative / Long term
VP6	12.1 km (T1)	Medium-Low	Negligible	Imperceptible / Neutral / Long term
VP7	6.9 km (T2)	Medium	Low	Slight / Negative / Long term
VP8	11.1 km (T2)	Medium	Low	Slight/ Negative / Long term
VP9	4.5 km (T1)	Medium	Medium-Low	Moderate-slight / Negative / Long term
VP10	17.7 km (T2)	High	Low	Moderate-slight / Negative / Long term
VP11	0.9 km (T1)	Medium-Low	High-medium	Moderate / Negative / Long term
VP12	1.5 km (T1)	Medium-Low	Medium	Moderate / Negative / Long term
VP13	1.6 km (T1)	Medium-Low	Medium-low	Moderate-slight / Negative / Long term
VP14	1.0 km (T2)	Medium-Low	High-medium	Moderate / Negative / Long term
VP15	9.8 km (T1)	High-Medium	Negligible	Imperceptible / Neutral / Long Term
VP16	1.0 km (T2)	Medium	Medium	Moderate / Negative / Long term
VP17	1.5 km (T1)	Medium-Low	Medium	Moderate / Negative / Long term
VP18	2.6 km (T1)	Medium	Negligible	Imperceptible / Neutral / Long Term
VP19	2.1 km (T2)	Medium-Low	Medium-Low	Moderate-slight / Negative / Long term
VP20	3.1 km (T1)	Medium	Negligible	Imperceptible / Neutral / Long Term
VP21	4.4 km (T1)	Medium	Medium-Low	Moderate-slight / Negative / Long term
VP22	10.3 km (T2)	Medium-Low	Negligible	Imperceptible / Neutral / Long term
VP23	9.7 km (T1)	Medium	Negligible	Imperceptible / Neutral / Long term
VP24	16.7 km (T1)	Medium	Negligible	Imperceptible / Neutral / Long term
VP25	10.5 km (T2)	High-Medium	Negligible	Imperceptible / Neutral / Long term
VP26	10.1 km (T2)	Medium	Medium-Low	Slight / Negative / Long term
VP27	18.7 km (T1)	Medium	Low-negligible	Slight-imperceptible/ Negative / Long term
VP28	15.0 km (T1)	Medium	Negligible	Imperceptible / Neutral / Long term
VP29	1.5km (T1)	Medium-Low	Negligible	Imperceptible / Neutral / Long term

5.9.4.1 Visual Impacts on Designated Scenic Routes and Views (SR/SV);

As identified in the visual baseline and sensitivity discussion above, those designated routes and views relevant to the project are represented by VP1, VP2, VP5, VP7, VP8, VP10, VP21, VP25, VP26 and VP27. Many of these are also representative of other receptors; however, their primary purpose within this assessment and source of sensitivity is the scenic designation applied by the relevant County.

Viewpoint 1 at Rinn Lough and Viewpoint 10 at Granard Motte and Bailey are both viewpoints where the sensitivity is deemed High. At both, the proposed development is viewed at a distance of 17-18km, occupying a small section of a wider, long-distance view. At VP1, one turbine is clearly visible while the other is screened, set off-centre to the main axis of the Lough, within a more varied horizon, resulting in the visual impact of Low-negligible and final significance of Slight, of negative quality. In contrast, VP10 is a wide, relatively even horizon, featuring the two turbines stacked in the view with a small degree of visual irritation as a result. Therefore the magnitude of impact at VP10 is Low, resulting in a final significance of Moderate-slight and negative quality.

A different character of view is experienced at VP25, set within Ardagh Village, where there is a higher number of viewers due to being located within a population centre, but a corresponding reduction in tranquillity and naturalness. The sensitivity is deemed High-medium, however the proposed development is fully screened, resulting in a significance of Imperceptible, and neutral value.

The majority of scenic designations within Co. Longford are routes located along public roadways; those to the north of the site are broad, slightly elevated views across a rolling rural context. These include VP2, VP5, VP7, VP8, VP26 and VP27 are deemed Medium sensitivity. VP2 is fully screened, despite theoretical visibility on the terrain-based ZTV, emphasising the highly vegetated and screened nature of much of the study area. VP2 therefore features Imperceptible final significance of neutral quality. Viewpoint 5, Viewpoint 7 and Viewpoint 8 are representative of the cluster of scenic routes over Corn Hill and surrounding areas. Viewpoint 5 is partially screened, with the proposed development well separated from the primary amenity of the designated route. VP7 features closer proximity views. However, the aesthetic qualities of the development are pleasant, with even spacing and clear contextual separation from the viewer, located off-centre to the wider vista. VP8 is a longer distance, more open view. However, the proposed development is a well-contained, clearly presented and symmetrical feature. Views at each of VP5, VP7, and VP8 result in a Low magnitude of impact, with a final significance of Slight. Impacts at VP5, VP7 and VP8 are of negative quality.

VP21 is located at the periphery of Longford, where a slightly elevated location allows visibility over the built centre and heritage features. The proposed development is located away from these heritage features so as not to detract from the character of the town centre but at the periphery and therefore associated with sustaining the population centre. The magnitude of impact is deemed Medium-Low, with Moderate-slight significance and negative quality.

The remaining views of VP26 and VP27 are located in the rural south of the study area, each at localised rolling areas, which allow longer distance visibility. Viewpoint 26 is more elevated and open, located 10km from the proposed development, with clear, uncluttered and legible views of the development set within the lowland surroundings. Therefore the magnitude of visual impact is deemed Medium-low, Slight significance and negative quality. In contrast, VP27 is located at 18.7km distance, which is immediately evident in the reduced visual presence of the development within the

view. The slightly lower elevation of VP27 within the Shannon Valley increases the potential vegetated screening of the proposed development, as is the case at VP27. Consequently, VP27 is attributed an impact magnitude of Low, with a resulting significance of Slight and negative quality.

As a result of the reasons outlined above, **it is not considered that the proposed development will result in significant visual impacts regarding designated scenic routes and views** within the study area.

5.9.4.2 Visual Impacts on Local Community views (LCV);

Local Community views include VP11, VP12, VP13, VP14, and VP19. The sensitivity of these views is deemed Medium-Low. These views primarily focus on the 'susceptibility of receptor group to changes in view' but less so on the 'values typically associated with visual amenity'.

Viewpoints 11, 12, and 13 are located in the surroundings of Melview, to the northwest of the proposed turbines. VP13 is also representative of the R198 road corridor. These feature intermittent, close-range views of the proposed turbines. The proximity of views is mitigated by the generally clear land use transition over pasture and hedgerows or conifer forestry to the proposed turbine locations. Two of these views (VP12, VP13) are located at c. 1.5km from the proposed development and experience a final significance of Moderate and Moderate-slight (negative quality), respectively. While VP11 and VP14 are located slightly closer, at c.1km distance. Viewpoint 11 is located along a minor lane 0.9km to the north of T1, where the close proximity view results in a final significance of Moderate (negative quality).

Viewpoint 14 is located along a small lane of residences to the northeast of the proposed development, where the proposed development presents clearly in the foreground, introducing some visual conflict of land uses and the perceived proximity between the adjacent residences. Therefore, the magnitude of impact is deemed High-medium, with a resulting significance of Moderate, of negative quality.

VP19 is slightly separated from the other local community views to the south of the proposed development at the periphery of Longford. The cluttered foreground is mitigated by the sense of perspective and intermittent visibility, resulting in a final significance of Moderate-slight (negative quality).

Finally, VP29, at Clonbalt Wood is entirely screened by the dense boundary vegetation of the residential area and the surrounding built form. Therefore, the magnitude of impact is deemed Negligible, with a resulting significance of Imperceptible, of neutral quality.

As a result of the reasons outlined above, **it is not considered that the proposed development will result in significant visual impacts regarding local community views** within the study area.

5.9.4.3 Visual Impacts on Centres of Population (CP);

Five viewpoints were chosen to represent centres of population within the central and wider study area (VP4, VP9, VP18, VP20, and VP24). Each of these views were deemed Medium sensitivity due to a mix of built heritage and natural amenity and higher viewer numbers. Two views are located within Longford (VP18, VP20), both of which were included to address heritage features within the town. The

visibility within Longford is limited by vegetation and built form; as such, both these views feature Negligible visual impact and Imperceptible final significance of neutral quality. The other three views (VP4, VP9 and VP24) are located in smaller towns in the western study area, at Drumlish, Newtown Forbes and Ballyleage, respectively. Rolling landform and vegetation enclosure serve to screen views from VP4, resulting in Negligible visual impact and Imperceptible final significance of neutral quality. The Shannon/Lough Ree riparian vegetation at VP24 serves to screen much of the surrounding landscape, including the proposed development, resulting in Negligible visual impact and Imperceptible final significance of neutral quality. As mentioned above, Viewpoint 9 features less overt amenity, being set outside and facing away from the gates of Castleforbes Demense, more directly representing the local community and fleeting views from the N4. The proposed turbines are visible at a modest scale over the surrounding built form, resulting in a Medium-Low impact and Moderate-slight significance of negative quality.

As a result of the reasons outlined above, **it is not considered that the proposed development will result in significant visual impacts regarding population centres** within the study area.

5.9.4.4 Visual Impacts on Major Routes (MR); and

The densest concentration of major routes across the study area surrounds Longford; however, these diverge across the study area. The five viewpoints selected primarily to represent major routes are VP3, VP6, VP16, VP17, and VP22.

VP3 is located with wide views over Lough Bofin, with a number of residences in the immediate surrounds, has long distance views of the proposed development, off-centre to the higher amenity areas surrounding Lough Bofin, resulting in an impact of Low-negligible and Slight-imperceptible significance, of negative quality.

VP6 is located near the River Shannon and the population centre of Roosky, however the location does not relate well to the river, and is generally enclosed. This lower sensitivity and screening results in Negligible impacts and Imperceptible (neutral quality) significance.

VP16 also represents the heritage values of Carrickglass Demesne and surrounds, therefore, is deemed Medium sensitivity. This is a close proximity view, with both turbines visible over the hub between and above the established trees and historic (in disrepair) walled garden of Carrickglass Demesne. The open pasture and layered foreground serve to separate the development somewhat from the more sensitive surroundings. The magnitude of visual impact is deemed Medium magnitude, resulting in Moderate (negative) significance.

VP17 is located between the proposed development and Longford, where the N4 crossed the Camlin River. The river corridor provides a break in the vegetation, which allows a brief glimpse into the wider landscape and to the proposed development. The proximity and scale of the development are mitigated by the location within the open land uses to the north, including the patches of conifer forestry. However, the development will be a noticeable feature within this brief view of the surrounding landscape. Therefore, the High-medium magnitude of impact results in a Moderate final significance.

Finally, VP22 is located at a slightly elevated section of the N4, west of Edgeworthstown, however, typical of much of the study area, layers of intervening vegetation screen the partially visible turbines, resulting in a Negligible impact and Imperceptible (neutral) final significance.

As a result of the reasons outlined above, **it is not considered that the proposed development will result in significant visual impact regarding major route features** within the study area.

5.9.4.5 Visual Impacts on Amenity and heritage features (AH).

A number of heritage and amenity features are included in the views addressed above, in particular within the scenic designations (VP1, VP10, VP25) and Centres of Population (VP18, VP20). The remaining views are focused along waterways. These include VP15 at Termonbarry Lock, VP23 where the N63 crosses the Royal Canal, and VP28 at Mosstown Harbour, however at all instances, the surrounding vegetation screens potential visibility, resulting in a Negligible impact and Imperceptible (neutral) final significance.

As a result of the reasons outlined above, **it is not considered that the proposed development will result in significant visual impacts regarding amenity and heritage features** within the study area.

5.9.4.6 Summary of Visual Impacts

Based on the visual impact assessments outlined in Section 5.9.3 above and in Table 5.13 above, the residual visual impacts range between Moderate and Imperceptible, and in the majority of cases, the significance of visual impact was deemed Moderate-slight or below. Only five views were deemed to have a visual impact significance of Moderate. All five of these are the nearest potential views of the proposed development, all within 1.5km of the proposed turbines, while VP16 is also representing a more sensitive heritage receptor. Three (VP11, VP14, VP17) experience High-medium impacts, while VP16 features Medium impacts – combined with the Medium viewpoint sensitivity to result in Moderate significance. VP12 also experiences Medium impacts and Moderate significance. Overall, the proposed wind farm is considered a modest two-turbine development that does not appear out of place in terms of its scale or function in this diverse landscape context. As discussed in the landscape impacts section, where viewed from longer distance locations, the proposed development is clustered with the higher intensity land uses associated with a population centre.

Overall, it is not considered that the proposed wind farm development will result in significant visual impacts at any surrounding receptors.

5.9.5 Visual Impacts – Decomissioning Stage

Visual impacts at the decommissioning stage will be very similar to the construction stage and will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. As with the construction stage, there will be HGVs travelling to and from the site, removing built features that formed part of the proposed Project. Whilst the most notable visual impacts will still arise from the erection of large tower cranes to remove the turbine structures. Impacts relating to the removal and reinstatement of the substation and hardstands will be similar to those of the construction stage, due to the prescence of machinery and removal of material required. However, a large part of this short-term activity within the site will remain screened from view by the hedgerows and mature conifer plantations that surround the site and its immediate landscape

context. Furthermore, decomissioning-related activity is short-term in nature and will cease once this stage is completed.

For these reasons, the magnitude of visual impact at the decommissioning stage is deemed to be no greater than **High/High-medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low/Low-negligible**. Combined with a within a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Substantial-moderate** for those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Moderate/Moderate-Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the decommissioning stage.

5.9.6 Cumulative Impacts

As described in Section 5.6.6 there is 1 operational wind farm and 1 consented single turbine within the study area, so wind energy development is considered to be a familiar, but not strongly characteristic or defining feature of the landscape within the study area. The permitted Lissanore Turbine is a single turbine 13km east of the proposed development, while the existing Sliabh Bawn Windfarm is composed of 19 no. turbines, thus, is the most relevant in terms of potential cumulative effects. However, these have been addressed within the baseline analysis and viewpoint assessment, as well as the existing landscape and visual context. Whilst the Wind Energy Development Guidelines 2006 highlight the potential aesthetic issue of turbines from different schemes becoming stacked in perspective if seen on the same alignment, this is not a particular issue in this instance. This is on the basis that the Sliabh Bawn turbines are most commonly seen as small-scale distant features on an elevated forested ridge when seen in combination (same viewing arc) as the proposed Cloonanny turbines in particular as the viewing distances will be 19-20km between the two wind farms, and up to 40km between the viewpoints in the eastern study area (such as V10 at a distance of 36km) and Sliabh Bawn from the view.

The proposed development has the potential to contribute cumulative impacts to the permitted Lissanore Turbine. This is a single turbine located in the east of the study area, at 13km distance from the proposed Cloonanny Turbines. There is potential combined visibility from views in the north and northeast of the study area, in particular at VP3, VP7, VP8, and VP10. At all of these locations, the proposed developments will be well separated and of a similar scale, almost exclusively at viewpoints with broad views encompassing large areas of mixed land uses, where seeing higher intensity land uses such as wind energy is not out of place. Therefore, the magnitude of cumulative impact is deemed **Low.**

5.9.7 Cumulative impacts – Potential Baseline

As discussed in the methodology section, the EIA Directive requires only that other existing and/or approved projects be considered. A more conservative approach has been adopted here, with consideration of the cumulative impacts arising in connection with known projects at the pre-planning stage. As these 'known' projects progress through the development management process, a full

assessment of the landscape and visual effects, including in-combination effects, will be undertaken for that project in advance of a decision being made. As such, in addition to the projects considered above, the pre-planning Derryadd Windfarm is considered as 'Potential Baseline'. Derryadd Windfarm had been granted permission by An Bord Pleanala in 2019. However, the decision was challenged and ultimately quashed by the High Court. Therefore the project design is being revised and it is expected that a new SID application will be made in future.

It is anticipated, that the Derryadd Windfarm would result in the addition of 22 turbines, located c. 12.5km south of the site. Given the distance to the subject site and following a precautionary approach, these turbines have been included in the wireframe views. As seen in the wireframes, the Derryadd turbines would be by far the most likely to be viewed in conjunction with the proposed Cloonanny turbines, either in succession or combination. Should the proposed Cloonanny and Derryadd developments be constructed, there would be two defined areas and two different characteristics of wind energy development across the study area. The Cloonanny and Lissanore turbines are small schemes located adjacent to and in proportion to population centres within more complex land use patterns. Meanwhile, the existing Sliabh Bawn and potentially Derryadd development present as more extensive developments with a larger number of turbines spread over larger land use patterns in the south of the study area, on either side of the Shannon. The addition of the Cloonanny turbines into the wider landscape occupied by the existing Sliabh Bawn wind farm and potentially Derryadd Wind Farm would read as a scaling of the land use type in response to the landscape characteristics.

As can be seen below, in the potential baseline scenario, the addition of Derryadd will marginally increase the proportion of the study area with visibility; however, as depicted in the visual impact assessment, the actual visibility is much less and very location-specific. Furthermore, whilst the proposed development will generate some increase in the intensity of wind farm development within the study area, most notably in the local landscape in the immediate surrounds of the proposed development, it represents a relatively minor increase in the overall number of turbines within the study area. Therefore, the cumulative impacts resulting from the Cloonanny development are deemed **Low.**

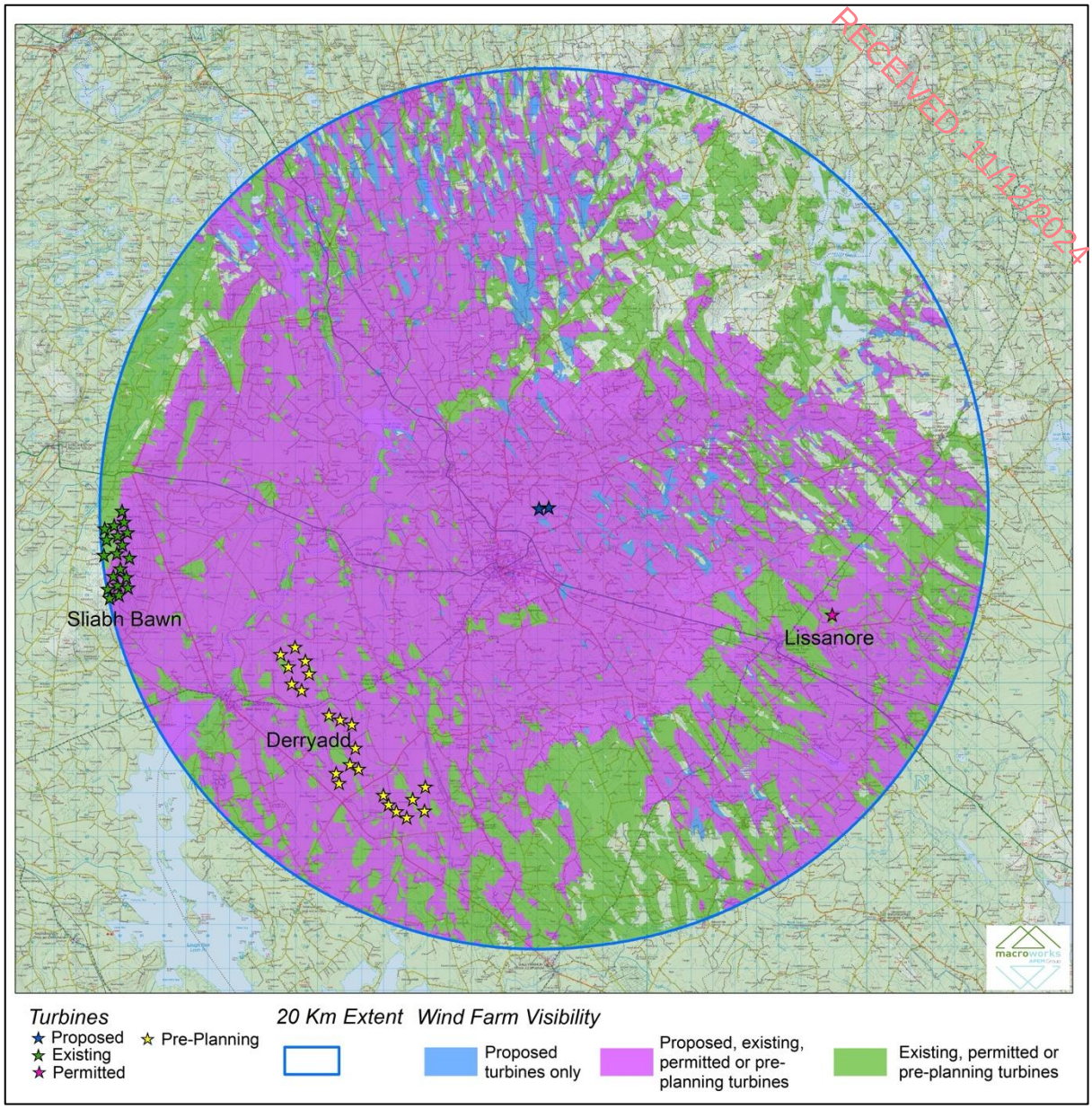

Figure 5.12 Cumulative ZTV including potential future windfarm developments

5.10 Mitigation Measures

5.10.1 Incorporated Design Mitigation

Given the highly visible nature of commercial wind energy developments it is not generally feasible to screen them from view using on-site measures as would be the primary form of mitigation for many other types of development. Instead, landscape and visual mitigation for wind farms must be incorporated into the early stage site selection and design phases.

In this instance the main form of landscape and visual mitigation employed is the reduction of the 3-4 turbines previously considered to a two-turbine layout.

5.10.2 Demolition Phase Mitigation

Aside from demolition stage mitigation measures to minimise land and vegetation disturbance and dust emissions (which may reduce visual amenity), there are no specific mitigation measures to be implemented. The appropriate management and reinstatement of excavations, in a timely manner, will ensure that any adverse effects caused, for example at site entrances or road upgrade locations, are minimised insofar as possible. Similarly, the progressive reinstatement and landscaping of the site will remediate any short term adverse effects on the local landscape.

5.10.3 Construction Phase Mitigation

The construction phase mitigation is as described in section 5.10.2

5.10.4 Operational Phase Mitigation

There are no operational phase mitigation measures additional to the incorporated design ad 'appropriate management and reinstatement of excavations' in the construction phase described above.

5.10.5 Decommissing Phase

The decomissioning phase mitigation is as described in section 5.10.2.

5.11 Residual Impact Assessment

As described above, landscape and visual mitigation measures that formed part of the iterative design process of this Proposed Development over a number of years, and which are embedded in the assessed project. Therefore other specific landscape and visual mitigation measures are not considered necessary / likely to be effective. Thus, the impacts assessed in Section 5.8 and Section 5.9 are the equivalent of residual impacts in this instance. These are summarised below.

5.11.1 Demolition Phase

5.11.1.1 Landscape

Overall, the magnitude of demolition stage landscape effects within the site and its immediately surrounding context is deemed to be **Medium** and of a **Negative** quality, but of a **Temporary** duration. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the decommissioning related activities become a proportionately smaller component of the overall landscape fabric.

5.11.1.2 Visual Impact

For these reasons, the magnitude of visual impact at the demolition stage is deemed to be no greater than **Medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low-negligible**. Combined with a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Moderate-slight** for

those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances within the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the demolition stage.

5.11.2 Construction Phase

5.11.2.1 Landscape

With regards to construction impacts based on a **Medium-low** sensitivity judgement of the central study area and a **High-medium** magnitude of construction stage landscape impact, the significance of impact is considered to be **Substantial-moderate / Negative / Short-term** within and immediately around the site during construction, but reducing quickly with distance and broader context. Across the wider study area, the significance will reduce from **Moderate-slight** to **Slight-imperceptible** between 5km and 20km distance to the site.

5.11.2.2 Visual Impact

For these reasons, the magnitude of visual impact at the construction stage is deemed to be no greater than **High/High-medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low/Low-negligible**. Combined with a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Substantial-moderate** for those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Moderate/Moderate-Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances within the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the construction stage.

5.11.3 Operational Phase

5.11.3.1 Landscape

Based on a **Medium-low** sensitivity judgement and a **Medium** magnitude of operational stage landscape impact, the localised significance of impact is considered to be **Moderate / Negative / Long-term** within and immediately around the site. Thereafter, significance will reduce to **Moderate-Slight** and **Slight-imperceptible** at increasing distances as the development becomes a progressively smaller component of the wider landscape fabric even in the context of higher sensitivity landscape units / features such as the Shannon to the west, and scenic designations to the north.

5.11.3.2 Visual Impact

Based on the visual impact assessments outlined in Section 5.9.3 above and in Table 5.13 above, the residual visual impacts range between Moderate and Imperceptible, and in the majority of cases, the significance of visual impact was deemed Moderate-slight or below. Only four views were deemed to have a visual impact significance of Moderate. All four of these are the nearest potential views of the

proposed development, all within 1.5km of the proposed turbines, while VP16 is also representing a more sensitive heritage receptor. Three (VP11, VP14, VP17) experience High-medium impacts, while VP16 features Medium imapcts – combined with the Medium viewpoint sensitivity to result in Moderate significance. Overall, the proposed wind farm is considered a modest two-turbine development that does not appear out of place in terms of its scale or function in this diverse landscape context. As discussed in the landscape impacts section, where viewed from longer distance locations, the proposed development is clustered with the higher intensity land uses associated with a population centre.

5.11.4 Decommissing Phase

5.11.4.1 Landscape

Overall, the magnitude of decommissioning stage landscape effects within the site and its immediately surrounding context is deemed to be **Medium** and of a **Negative** quality, but of a **Temporary** duration. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to **Low** and **Negligible** at increasing distances as the decommissioning related activities become a proportionately smaller component of the overall landscape fabric.

5.11.4.2 Visual Impact

Overall, the magnitude of visual impact at the decommissioning stage is deemed to be no greater than **High/High-medium** at the nearest surrounding receptors, however, this reduces swiftly at greater distances from the site, especially within the wider study area, where the magnitude of visual impact is considered to be no greater than **Low/Low-negligible**. Combined with a within a **Medium-low** sensitivity for receptors within the central study area, the significance of visual effect will be **Substantial-moderate** for those within approximately 1km of the site. Thereafter, the significance of effect will reduce to **Moderate/Moderate-Slight** throughout the central study area and **Slight** and **Imperceptible** at increasing distances the wider study area as the development becomes a progressively smaller component in the afforded view. Thus, it is not considered that the proposed project will generate significant visual effects at the decommissioning stage.

5.11.5 Summary of Post-mitigation Effects

It is not considered that there will be any likely significant effects on landscape and visual amenity arising from construction, operation and decommissioning of the proposed Cloonanny Wind Farm.

5.11.6 Cumulative Residual Effects

As described above, landscape and visual mitigation measures that formed part of the iterative design process of this Proposed Development over a number of years, and which are embedded in the assessed project. Thus, the impacts assessed in Section 5.10 are the equivalent of residual cumulative impacts in this instance, and are deemed Low, of a Negative quality and Long term.

5.12 Risk of Major Accidents or Disasters

There are no expected significant adverse landscape or visual effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned.

5.13 Worst Case Scenario

The impacts described in this assessment are deemed representative of the worst case scenario with the described development parameters. There are no alternatives or variations proposed to have higher or lower landccape and visual impacts.

5.14 Interactions

The Proposed Development involves features and activities that have the potential to generate physical changes to the landscape and visual environment (both physical and perceptual), which will also incur wider environmental impacts. This includes aspects relating to vegetation loss, construction of access roads and road junctions, and the presence of construction and maintenance plant on the site. Likewise, there are aspects (such as noise) that have the potential to influence experiential aspects of landscape character.

Whilst these aspects will generate a degree of change to the landscape and visual environment, the main interactions relate to the construction and presence of the turbines and other vertical infrastructure due to their visibility.

The main interactions are considered to relate to Population and Human Health, and Cultural Heritage as follows:

5.14.1 Landscape and Visual and Population and Human Health

Landscape and Visual impacts arising from the construction, operation, and decommissioning of the wind turbines are considered in the LVIA with respect to the effect on perceived landscape character, views and on the general visual amenity experienced by people, including local residents. Proportionately, the operational effects of the turbines are considered to give rise to the most notable landscape and visual effects given the long-term nature of the change, and a greater focus is placed on them. However, whilst they have the potential to be prominent, the turbines will be seen in the context of a modified landscape, and it is noted that the findings of the assessment did not identify any significant impacts in relation to receptors in the Central or Wider Study Area. The findings of the LVIA have contributed to the Population and Human Health assessment.

5.14.2 Landscape and Visual and Cultural Heritage

Common receptors were considered in relation to landscape character and the setting of heritage features as well as views from heritage features visited by the public and for whom views of the landscape are a contributing factor to the experience. Whilst the turbines have the potential to be visible, they will be seen in the context of an extensively modified landscape. From particularly

important locations, the turbines would be seen at a considerable distance as a small part of wider panoramic views within which other turbines are visible. Again, it is noted that the findings of the assessment did not identify any significant impacts in relation to receptors in the Central or Wider Study Area.

5.15 Monitoring

There is no monitoring of Landscape and Visual elements or impacts proposed.

5.16 Summary of Mitigation and Monitoring

The mitigation measures are embedded in the proposed development assessed within this report and there are no monitoring measures proposed for Landscape and Visual at either demolition, construction, opernation, or decommissioning stages.

5.17 Conclusion

Based on the landscape, visual and cumulative assessment contained herein, it is considered that there will not be any significant effects arising from the proposed development.

5.18 References and Sources

- European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);
- Environmental Protection Agency (EPA) (2022) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)'
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Addition (2013).
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. [online]
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006).
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2019 draft). [2]
- Scottish Natural Heritage Visual Representation of Wind Farms: Best Practice Guidelines (version 2.2 - 2017).

[2] *It is important to note that all information and guidelines relating to landscape areas and types in the current wind energy development guidelines (2006) are duplicated in the draft revised wind energy development guidelines (2019). The only additional information relating to landscape and visual in the draft revised guidelines relates to the visual amenity setbacks. Thus, the current (2006) and draft revised (2019) guidelines have been referenced.*

CHAPTER 6
MATERIAL ASSETS: TRAFFIC AND TRANSPORT

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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6 Material Assets: Traffic & Transport

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the traffic and transportation impacts of the proposed development, with the purpose of identifying likely significant effects resulting from the construction phase, operational phase and possible future decommissioning phase including interactions with other planned developments or infrastructure projects. Recommendations are also made for mitigation measures to avoid or reduce identified impacts.

The chapter was prepared in consultation with the relevant members of the Design Team, and it should be read in conjunction with the submitted drawings together with supporting reports , in particular the Traffic & Transportation Assessment (TTA) prepared Stephen Reid Consulting Traffic & Transportation Limited (SRC) and the Project Construction and Environmental Management Plan including Preliminary Transport Management Plan (PTMP) prepared by Mable Consulting Engineers.

6.2 Expertise and Qualifications

This chapter was prepared by Stephen Reid of Stephen Reid Consulting Traffic & Transportation Limited (SRC). Stephen holds a BEng in Civil & Transportation Engineering from Napier University Edinburgh and is a Chartered Member of the Institute of Logistics & Transport with 29 years of professional experience as a traffic planning and design consultant in the UK and Ireland.

Stephen has carried out numerous traffic and transportation assessments and been involved in the preparation of Traffic and Transportation Chapters for numerous EIAR projects, both for the private sector and in support of SID projects for Eirgrid and ESB Networks.

6.3 Proposed Development

A brief summary of the development is outlined below. A detailed description of the proposed development is contained within Chapter 2 of this EIAR and the Planning Statement that accompanies the application. The statutory notices should also be referred to.

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

The grid connection from the proposed on-site substation to the national electricity grid does not form part of the subject planning application. However, as part of the planning application process, this EIAR addresses three potential grid connection options currently considered to ensure a comprehensive environmental assessment of all aspects of the Proposed Development. The grid connection will be via 1 of the 3 potential options outlined below:

- Option 1 Connect the proposed development via (8.03km) to Richmond 110kV Substation
- Option 2 Connect the proposed development via (3.96km) to Longford 38kV Substation
- Option 3 Connect the proposed development via (5.85km) to Glebe 38kV Substation

It is anticipated that the grid connection from the Proposed Development will be by means of an underground cable connecting to one of the Substations identified above via the public road network. For bridge crossings, the cable will be located within the bridge deck, where there is insufficient depth and width available horizontal directional drilling (HDD) will be employed as an alternative.

Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

All elements of the proposed development as outlined above together with the turbine delivery route and grid connection options have been assessed as part of this EIAR.

6.3.1 Aspects Relevant to this Chapter

The following aspects of the proposed wind farm development are relevant to potentially affecting the traffic and transport environment:

- **Construction of foundations and hard-standing areas:** the construction of foundations for the wind turbines and associated hard-standing areas will require significant deliveries of concrete, stone and steel, potentially impacting on traffic volumes and operating capacity on the local road network.
- **Construction of internal site access road:** the proposed access road will require significant deliveries of stone fill and crushed aggregate capping, potentially impacting on traffic volumes and operating capacity on the local road network.
- **Operation of internal site access road:** the proposed internal access road will require sightlines for vehicles exiting the road onto the L50462, with landscaping and boundary treatment works which could impact on existing users of the road .
- **Temporary alterations to haul routes and temporary access roads:** the creation of temporary access roads and junction accommodation works will impact on the road geometry and roadside boundary treatments.
- **Installation of underground circuit and communications cabling:** trenching for underground cables could impact existing road users, traffic flows and operating capacity, where these require road crossings or works alongside or within the area of the public road.
- **Associated site development and reinstatement works:** general site activities and construction related traffic, which will have to operate on or adjacent to the public road network. However, this effect will be temporary.
- **Grid connection routes:** routes for underground cable infrastructure from the Cloonanny Wind Farm to substation(s) on the existing grid network.

6.4 Methodology

6.4.1 Desk Study

A desk study of the proposed development site and the surrounding area was completed prior to undertaking the site walkover assessment.

The desk study involved the following:

- A review of existing and proposed transport infrastructure, with consideration of the key road network from the N4 delivery route to the Wind Farm site.

- Likely trip generation/traffic volumes associated with the project (construction and operational phases), developed from information contained in the Project CEMP detailing the proposed construction methodology and programme/duration of each phase of works, expected material quantities for the construction of the Wind Farm, and projected construction and operational staff numbers throughout the construction and operational life of the Wind Farm.
- Traffic forecasting, with a review of baseline traffic information collected for this project using Automatic Traffic Counters on key Regional and Local road links, supplemented by information available on the TII website for traffic volumes on the N4 in Co Longford, and consideration of expected traffic growth from application of TII Traffic Demand Forecasting indices.
- Identification of potential impacts during construction, operational and possible future decommissioning phases in the following areas:
    - Along the delivery route for wind turbine components and for general project construction traffic (deliveries and construction workers), including temporary works such as widening to accommodate the swept path of the large turbine components.
    - At the Wind Farm construction site.
    - Along the proposed grid connection route(s).

The data for the Traffic Baseline study was gathered from the following available online sources:

- Aerial Imagery from Google Maps (https://www.google.com/maps).
- Geohive Map Viewer (https://webapps.geohive.ie/mapviewer/index.html).
- Existing Traffic Count Data collected by Transport Infrastructure Ireland and available on the TII website (https://trafficdata.tii.ie/publicmultinodemap.asp).

6.4.2 Baseline Monitoring and Site Visit

Automatic Traffic Counters (ATCs) were installed by Traffinomics Limited on behalf of SRC to obtain traffic flow, composition and speed data on the following key road links for a continuous period of 7 days to provide a 'virtual week' of data, commencing on Friday 26th April 2024 through to Thursday 2nd May 2024 inclusive:

Site 1: R198 Drumlish Road - (Google Maps Ref: 53°45'12.1"N 7°47'41.5"W)

Site 2: L1011 East of Cahanagh - (Google Maps Ref: 53°45'51.5"N 7°47'12.7"W)

Site 3: L1011 West of Kiernan's Cross - (Google Maps Ref: 53°45'47.4"N 7°45'11.5"W)

Site 4: R194 West of Carriglass Roundabout - (Google Maps Ref: 53°44'39.5"N 7°45'22.0"W)

A daytime (early afternoon) site visit was undertaken by SRC on Thursday 16th May 2024 as a drive though of the key routes, starting from the N4 roundabout junctions with the R194 and the R198 and

via both of the Regional Routes to the junction of the L5046 and L50462, which provides access to the Wind Farm site, located on the L50462. The routes were driven in each direction to observe existing network conditions, route signage/road markings and possible conflict points and supplement/confirm previous desktop review from aerial photography and available Google Streetview imagery.

6.4.3 Impact Assessment Methodology

This chapter was prepared in accordance with the following national guidance documents on environmental impact assessment and associated transport impact assessment:

- *Guidelines on the Information to be Contained in Environmental Impact Statements* (Environmental Protection Agency, 2022)
- *Guidelines for Traffic & Transport Assessments* PE-PDV-02045 (Transport Infrastructure Ireland, 2014).

The EPA's recommended methodology for assessing impacts was used. Each potential impact was described in terms of its Quality, Significance, Duration and Type.

6.4.4 Consultation

Mable Consulting Engineers engaged in consultation with the Longford County Council (LCC) Roads Engineers responsible for reviewing the planning application, regarding proposed access arrangements.

Mr Barry McGinn of Mable met with Mr Liam Kiernan (Executive Engineer , LCC) and Mr Con Diffley (Senior Executive Engineer, LCC) on 8th August 2024 at the Wind Farm site. The 'work-in-progress' construction and traffic management drawings were emailed to LCC prior to the meeting, and were reviewed on site:

Notes of the meeting were supplied by Mable and in summary, the following points were discussed:

- Wind Farm Access Track Layout (the L50462): It was initially proposed to upgrade the northern section of the L50462 as a Construction Vehicle Access. Following review of the original proposals, the project ecologist raised concerns about proposed works adjacent to the existing river which is along the east side of the L50462 for approximately 210m resulting in silt washing from the roadway/track into the river (EPA Code: IE SH6C010800). an alternative proposal was prepared by Mable and discussed at the meeting, This alternative proposal was for a new section of access track in the field to the west of the L05462, with a new access junction onto the L5046. At the meeting LCC requested a further amendment to this alternative where the construction access track would be upgraded to a temporary diversion road so that any existing/non-construction vehicular traffic could also be accommodated, thereby diverting all vehicular traffic from the existing northern section of the L50462 but retaining the existing alignment for non-vehicular traffic (pedestrians/cyclists), and after completion of the construction works the temporary access road would be grubbed up and vehicular traffic would be reinstated to the existing L50462 alignment and junction with the L5046.

- Pedestrian Access: LCC requested consideration of the possibility of linking pedestrian access through the wind farm from the L50462 to the L50461, and Mable agreed to review and discuss with the Developer, although it was caveated at the meeting that this could require access via land outside the Developers control.
- Wind Turbine Component Delivery Route: The route from the Port of Waterford (Belview) to the M50 at Dublin and onto Co Longford via the M4/N4 was discussed, and Mable noted that the initial swept path assessment for the abnormal loads vehicle (delivering the turbine blades) considered the roads in the vicinity of Longford Town, and agreed to carry out additional swept path assessment for identifying possible temporary works at the N4 roundabouts at Edgeworthstown.
- Grid Route: Mable advised that the Grid Route is not part of the wind farm planning application, but Grid Route Options are a consideration in the preparation of the EIAR. The options that had been assessed prior to the meeting were either an underground connection to the Richmond Substation, or an underground connection to the Glebe Substation. LCC noted concerns with the extent of road that would be impacted by the construction of an underground route to the Richmond substation, and also possible existing capacity constraints at Richmond Substation, as LCC noted a solar farm project close to Richmond Substation was seeking to construct a different Grid connection route to Longford Substation instead of connecting to Richmond. Mable agreed to discuss with the Developer and review the options for connecting to alternative Substations, as well as co-ordinating of any future Grid works with the other Renewable Energy projects being planned in the area.

Mable followed up the meeting with an email on 7th October 2024 including updated drawings based on the discussions and agreed actions.

In respect of the N4 Upgrade (Mullingar to Longford (Roosky) Project, SRC notes from the project website that the project team are reviewing feedback from the third Public Consultation. Mable have advised that they have contacted Westmeath County Council who are the overseeing authority for the delivery of the project, but at this stage there are no impacts expected from the construction of the wind farm on the preferred route corridor.

There may need to be future co-ordination with the N4 Upgrade Project Team for the planning and implementation of the Grid connection works (which are not part of this application) as the proposed cable route from the Wind Farm to the Grid substation could pass under the N4 Upgrade alignment.

6.5 Difficulties Encountered

No significant difficulties were encountered. Traffic counter data was obtained during a school term-time week (7 days continuous data collection commencing 26th April 2024) to ensure the baseline data was representative of a neutral month and typical traffic conditions.

6.6 Baseline Environment

This section describes the existing baseline environment in terms of the road network, traffic and transport conditions in the area and surrounding environment of the proposed development.

Based on this information, the potential impacts of the proposed development are identified, and the measures required to mitigate any identified negative impacts on the transport environment.

6.6.1 Location

The proposed windfarm site at Cloonanny Glebe and the surrounding lands are approximately 3 km to the north east of Longford town centre are illustrated in Figure 6.1. The site has an area of approximately 17.28 hectares (ha) and comprises a number of private land parcels

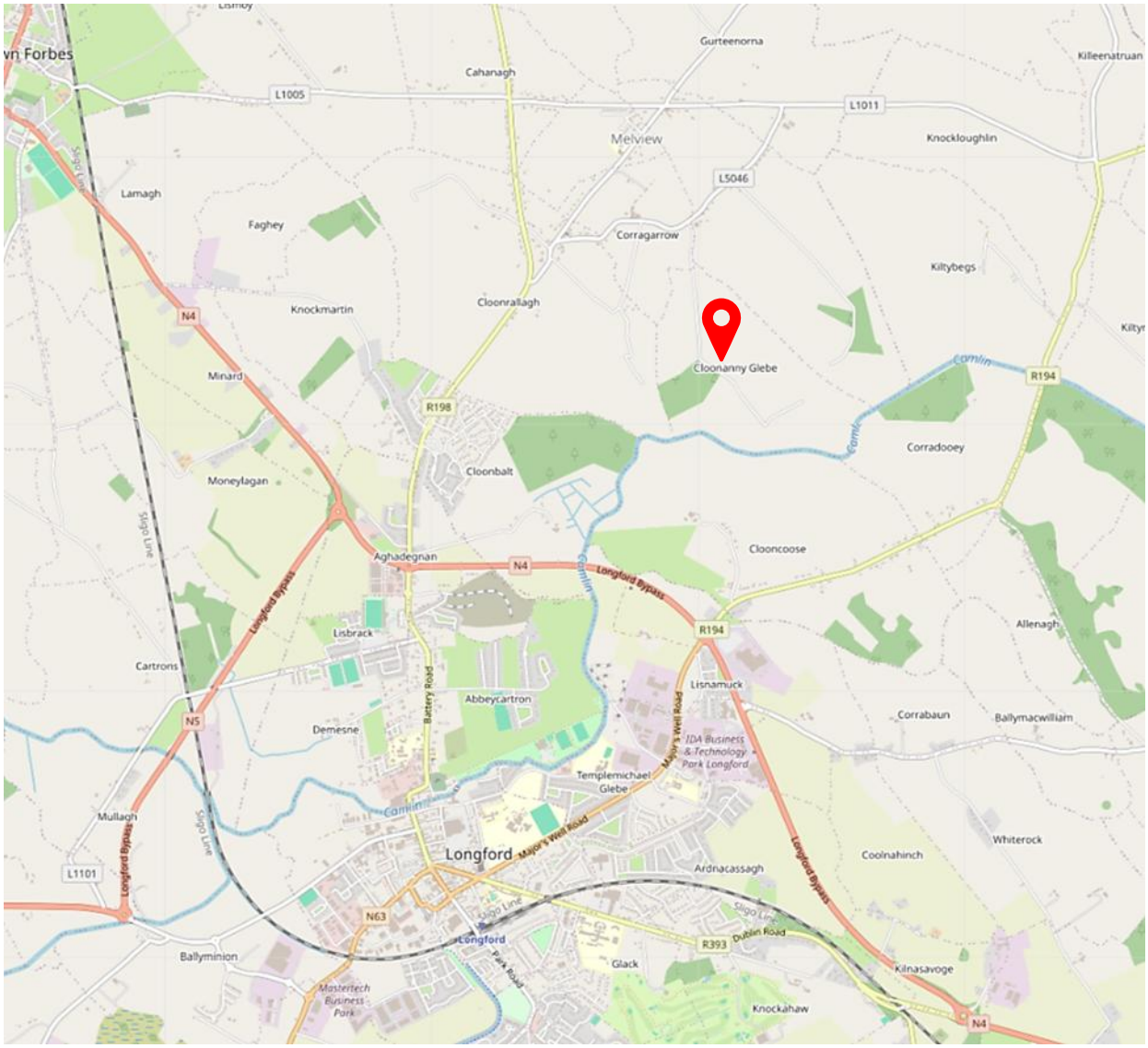

Figure 6-1 Proposed Site in a Regional Context (source: openrouteservice.org, 2024)

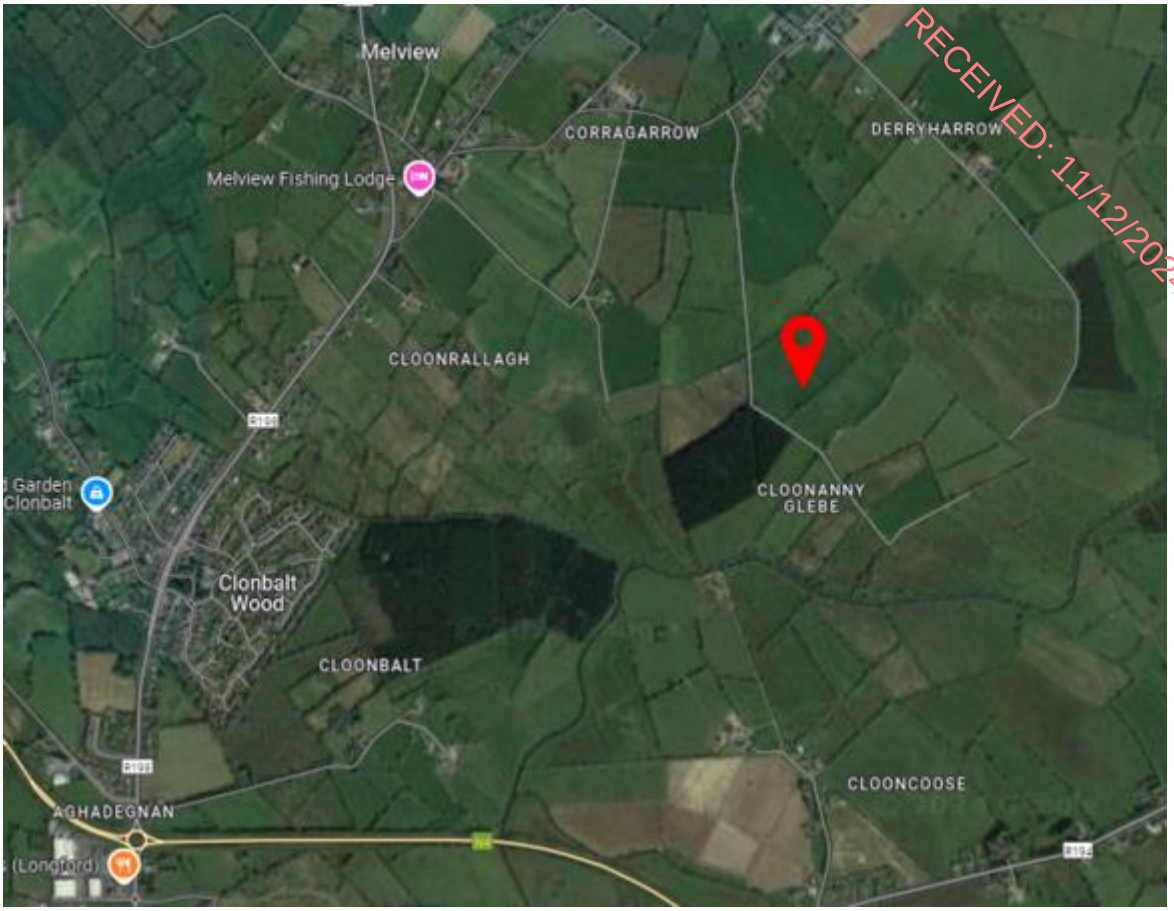

Figure 6-2 Proposed Site in a Local Context (source: google maps, 2024)

The application site comprises agricultural lands. The surrounding area is generally rural with individual or small clusters of dwellings and agricultural buildings along the L5046, L1011, R198 and R194.

There are larger residential estates located adjacent to either side of the R194 at Clonbalt, to the north of the N4 junction, with dedicated right turn storage lanes at the grouped access junctions.

Melview National School is located to the south west of the L1011/L1018 junction (approximately 0.5km to the northwest of the site).

6.6.2 Existing Road Network and Existing Site Access

Please refer to Figure 6.3 in conjunction with the following descriptions of the key road network providing access to the site.

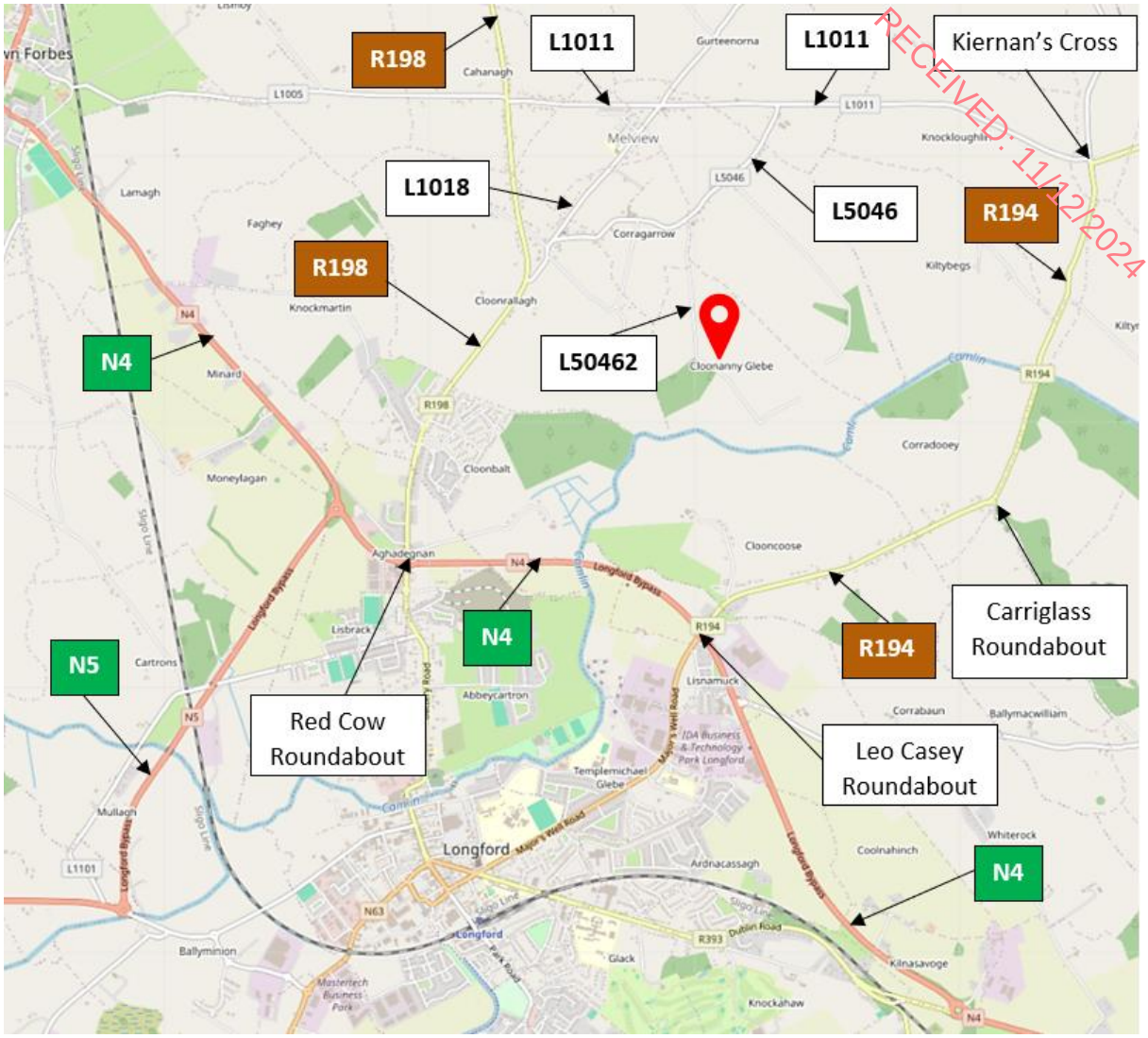

Figure 6-3 Road Network Serving Site Area to North of Longford Town (source: openrouteservice.org, 2024)

L50462: The site area is accessed via the L50462, which is a narrow laneway (approximately 3 m in width) extending southwards for just over 1km from the L5046 local road.

There are no dwellings or farm buildings noted along the L50462, and it is only used for infrequent agricultural vehicle access to several field gates (there is grass growing along the centre of the road between the wheel track zones and it is not suitable for frequent two-way vehicular traffic, with passing opportunities limited to localised widening at field gate accesses.

L5046: The L5046 connects with the L1011 to the north east of the L50462 junction, approximately 830m measured by road, and also connects with the L1018 to the south west of the L50462 junction, approximately 775m measured by road.

The typical cross-section of the L5046 road ranges between 4m and 5m with some areas of localised widening at agricultural yards or dwelling frontages. The section of the road to the southwest of the

L50462 junction could be described as 'sinuous' with a series of bends in the alignment, while the section between the junction and the L1011 is generally straighter with only minor bends in the alignment.

L1011: The northern end of the L5046 intersects with the L1011, which traverses the area in a generally east-west orientation, linking the R198 at its western end and the R194 at its eastern end, via the skewed cross roads with the L1018 at Melview. The L1011 is a two-lane single carriageway with a typical cross-section width of 5.75m-6.5m).

The R194 junction with the L1011 (Kiernan's Cross) is located 1.75km to the east of L5046 junction (distance measured by road).

R194: The R194 regional road extends northeastward from the N4 at the Leo Casey Roundabout, connecting Longford town and the N4 Longford Bypass to Ballinalee, and then continues in a generally eastwards heading, intersecting with the N55 at Granard before continuing onto Co Cavan.

The Leo Casey Roundabout is approximately 3.7km by road from Kiernan's Cross. The fourth arm of this 60m outer diameter roundabout connects to Longford town centre via the N63 (the Majors Well/Ballinalee Road), entering the town centre area at St Mel's Cathedral.

Approximately 1.75km from the N4 junction there is a four arm roundabout on the R194 at Carrickglass (one arm is the access to the former Carrig Glas Golf Resort). This is a compact roundabout with a 27.5m outer diameter and a central roundabout with a concrete apron for longer HGV overrun.

L1018: To the west of the Cloonanny Glebe/Melview area, the L1018 connects to the R198, 250m from the L5046 junction. The L1018 extends northeastwards from the L5046 and intersects with the L1011 at Melview.

R198: The R198 extends northwards from Longford Town to Drumlish and then northeastwards into Co Cavan at Arvagh. Approaching the L1018 from the south, the R198 has a right turn storage lane (ghost island hatching). The R198 is a two lane single carriageway with narrower sections of hard shoulder/edge of carriageway markings (typical cross-section width of 6.5m-7m).

The R198 intersects with the N4 Longford Bypass at the 'Red Cow' Roundabout, 1.7km to the south of the L1018 junction.

N4: The N4 Bypass continues northwestwards from this 60m outer diameter roundabout to the Charlotte Brooke Roundabout, where the N5 section of the Longford Bypass terminates, with the N4 continuing northwestwards to Sligo, via Newton Forbes and Carrick on Shannon. The N5 extends westerly via Co Roscommon to Castlebar in Co Mayo. The N4 is typically a two-lane wide single carriageway with hard shoulders (total cross section width of 13m-14m).

Existing Speed Limits and Surveyed Road speeds: The R194 is currently subject to a 50 km/h speed limit from the N4 roundabout for a distance of approximately 330m, before increasing to a 60 km/h limit, which extends to a point approximately 100m to the northeast of the Carrickglass roundabout, and then to a 80 km/h speed limit from there. It is noted from speed survey data collected in April/May 2024 on the 60 km/h section to the southwest of the Carrickglass roundabout that the 85th percentile

speed of traffic on the R194 is 79.6 km/h (in excess of the current 60 km/h limit on that section of the road).

The R198 is currently subject to a 50 km/h speed limit from the N4 roundabout for a distance of approximately 1km, before increasing to a 60 km/h limit, which extends to a point approximately 100m to the southwest of the L1018 junction, and then to a 80km/h speed limit from there. It is noted from speed survey data collected in April/May 2024 on the 60km/h section to the southwest of the 60km/h / 80km/h speed limit change that the 85th percentile speed of traffic on the R198 is 80.6 km/h (in excess of the current 60 km/h limit on that section of the road).

The April/May 2024 speed survey data for the L1011 to the west of the R194 junction (node 205-206 in the Mable delivery route mapping), identified an 85th percentile speed of 88.5 km/h, which is above the posted speed limit of 80km/h, although it is noted this route will have to be reduced to a default rural L-road speed limit of 60 km/h as part of the speed limit review which LCC are to have in place by end of 2024.

As the Cloonanny Wind Farm site is in a rural area there are no footpaths or street lighting provisions along the local roads. There are some sections of footpath and streetlighting on the R194 (near the N4 junction) and the R198 has footpath provision from the N4 to the 60 km/h / 80 km/h speed limit change and streetlighting from the N4 roundabout to the L1018 junction.

6.6.3 Existing Road Network Traffic Volumes

Automatic Traffic Counters (ATCs) were installed by Traffinomics Limited on behalf of SRC to obtain traffic flow, composition and speed data on the following key road links for a continuous period of 7 days to provide a 'virtual week' of data, commencing on Friday 26th April 2024 through to Thursday 2nd May 2024 inclusive:

Site 1: R198 Drumlish Road - (Google Maps Ref: 53°45'12.1"N 7°47'41.5"W)

Site 2: L1011 East of Cahanagh - (Google Maps Ref: 53°45'51.5"N 7°47'12.7"W)

Site 3: L1011 West of Kiernan's Cross - (Google Maps Ref: 53°45'47.4"N 7°45'11.5"W)

Site 4: R194 West of Carriglass Roundabout - (Google Maps Ref: 53°44'39.5"N 7°45'22.0"W)

The locations are illustrated in Figure 6.4.

The full data outputs are contained within the Traffic and Transport Assessment (TTA) included in Appendix 6-1 of the EIAR.

Figure 6-4 April/May 2024 Traffic Counter Locations (source: google.ie/maps)

These counts determined the existing network weekday peak hours occur at 08.00-09.00 and 17.00-18.00 (which is to be expected as these coincide with commuter traffic to/from Longford town).

In summary, the two-way total average daily traffic (ADT) volumes and two-way total average HGV content on each of the road links was recorded as follows.

Table 6-1 Baseline 2024 Traffic Volumes from Automatic Traffic Counter Data

Site Location	Average Daily Traffic (2 way total)	Percentage Daily HGVs (2 way total)
Site (1) R198 between N4 and L1018	7,417 vehicles	3.56%
Site (2) L1011 between R198 and L1018	885 vehicles	3.45%
Site (3) L1011 between L5046 and R194 Kiernan's Cross	1,386 vehicles	4.44%
Site (4) R194 south west of Carrickglass roundabout	4,994 vehicles	3.22%

For reference Site 3 is on Haul delivery Node 205-206 (from Mable delivery route mapping)

For reference Site 4 is on Haul Delivery Node 202-203 (from Mable delivery route mapping).

In addition to the ATC data collected at the four sites, the TII traffic counter website was also reviewed as there is a Permanent Traffic Counter site on the east section of the N4 Longford Bypass (site ID: TMU N04 110.0 W – see Figure 6-4), which relates to Haul delivery Node 201-202, located on the N4 Longford Bypass between the Leo Casey Roundabout and the Padraic Colum Roundabout.

This identified an ADT of 13,788 vehicles, with 9.80% HGV for the same 7-day period commencing Thursday 26th April 2024.

Figure 6-5 Map from Dashboard for TII Permanent Traffic Counter on N4 Longford Bypass (source: https://trafficdata.tii.ie/, September 2024)

Figure 6-6 Screenshot of Dashboard from TII website showing format of Permanent Traffic Counter Data Summary (source: https://trafficdata.tii.ie/, September 2024)

A further review of the TII Counter dashboard in September 2024 for the site on the N4 identified a similar 7-day Average flow volume to the 7-day average figure from a start date of 26th April 2024,

being 13,785 vehicles per day in September 2024 (illustrated in the green box on the dashboard screenshot in Figure 6.6).

It should be recognised that there is an expectation of annual traffic growth generally on the road network, and the 2024 baseline traffic volumes would be expected to increase in the future years, due to general development and an increase in car ownership that needs to be taken into consideration when assessing future year road volumes and impacts, with the actual growth period depending on the planning and construction programme for the proposed Wind Farm.

The TII Project Appraisal Guidelines Unit 5.3 document 'Travel Demand Projections' (PE-PAG-02017, October 2021) gives the expected percentage increases in general road traffic.

The PE-PAG-02017 document provides growth factor indices by County, and it is standard for development project assessment to use the 'Central Growth Rates'.

The annual growth rates for Co Longford are as follows (in terms of light vehicles (LV) and heavy vehicles (HV), from 'Table 6.2 Link Based Growth Rates' in the TII document):

- 2016-2030 LV = 1.0134 per annum, HV = 1.0313 per annum
- 2030-2040 LV = 1.0038 per annum, HV = 1.0124 per annum
- 2040-2050 LV c= 1.0027 per annum, HV = 1.0157 per annum

The N4 upgrade from Mullingar to Longford (Roosky) project is currently in planning and includes an emerging preferred corridor for the N4 which will be offline of the existing N4 Longford Bypass.

Following completion of the N4 upgrade project the existing N4 counter site referenced in Figure 6-6 above would be on a downgraded section of the road network and would therefore have a reduced traffic flow due to transfer of interurban traffic onto the new N4 upgrade alignment.

6.7 The 'Do Nothing' Scenario

If the proposed development were not to proceed, the proposed site would remain as a greenfield site, continuing to be used for agriculture, with minimal agriculture-related traffic using the local road network.

6.8 Potential Significant Effects

Section 6.3.1 provides an overview of the relevant traffic and transport aspects of the project during the construction and operating life of the proposed windfarm. The following sections set out these impacts. Where construction-related effects are considered in the sections following, account has been taken of proposed demolition activity in the assessment.

6.8.1 Construction Phase

The construction period of the proposed windfarm development will have significant effects in terms of traffic and transport impacts due to temporary revisions/interventions on the road network and

associated civil engineering works to accommodate the delivery haul route for the wind turbine components, works related to Grid connection underground cable routes on or adjacent to the road network, and traffic impacts associated with construction staff travel and materials deliveries to the windfarm site.

Staff Travel and Parking

The CEMP states that an anticipated 25 persons will be directly employed during peak activities on the wind farm. There will also be 5 persons directly employed during the grid connection works, and there will be a similar number of 5 persons directly employed during the temporary works on the turbine delivery route construction and reinstatement, excluding sub-contracted TTM company staff who will operate traffic control measure to manage traffic through areas on the public road where temporary works activities are being undertaken.

The staff vehicle parking will be accommodated at the wind farm site within the construction compound area and there will be no parking of staff vehicles on the public road. Visitors to the site from the Project Design/Project Management Team, and other visitors such as LCC and ESB Engineers will also be advised that they must park in the compound.

Staff working away from the main windfarm site on the temporary works for the turbine delivery route, or on the Grid connection works will travel to the main windfarm site compound and park there, and will then travel to the external sites on the public road in contractor vehicles (i.e. van, small flatbed truck), with parking at each worksite for the contractor vehicle defined within the working space zone with suitable TTM measures (cones, barriers, signage, etc.) to ensure these vehicles are not parked on the live public road or blocking passing traffic.

Construction Programme and Key Activity Phases

The key aspects and durations over the 24-month period of construction activities are contained in the CEMP and are proposed to be undertaken in Phases, as follows (with some concurrent/overlapping Phases carried out in parallel as illustrated in the Gantt Programme chart in the CEMP):

1. Detailed design stage for construction, environmental and planning compliance and pre construction survey work (from start date to end of month 6)
2. Civil Engineering Enabling Works, including site boundary and site entrance works, construction compound, advance drainage and silt control measures, and tree and hedge cutting (months 4 and-5)
3. Civil Engineering Main Site Works, including upgrade and widening of the public roads at site, access road construction, crane hardstand construction, drainage works, and pre-turbine delivery reinstatement works (from start of month 7 – to end of month 16), and post-turbine delivery reinstatement works for 2 months (expected to commence after month 19 when the Turbine Delivery is completed).

4. Structural Engineering Works, including wind turbine foundation construction (including piling), met mast foundation construction, substation construction and BESS construction (from start of month 12 to end of month 16)
5. Turbine Circuit Connector Ducting and Cabling - (from start of month 17 to end of month 18)
6. Turbine Delivery Route Works – from start of month 14 to end of month 15)
7. Turbine Delivery, Erection & Commissioning – (from start of month 19 to end of month 24)
8. Site Electrical Works, Employer and ESB Networks Electrical Installations and Commissioning - (from start of month 17 to end of month 18)
9. Grid connection works, includes ducting works, cable installation works and Final connection works in ESB substation - (from start of month 17 to end of month 21)
10. Wind Farm Final Commissioning – (month 24).

Construction Materials Delivery Traffic Volumes

In terms of construction material deliveries to the main wind farm site, these will peak in Phases 3 (primarily crushed stone and capping materials) and Phase 4 (stone/aggregate and concrete deliveries), and there will also be several deliveries of steel reinforcement bar and mesh, expected primarily to occur during Phase 4.

The CEMP includes an estimate of a total of 10,260 cubic metres of stone fill to the main site, to be delivered in rigid and articulated tipper trucks, with the peak period for stone/aggregate deliveries during the access road construction (requiring approximately 63% of the total volume to be delivered to the site). During this period, it is estimated there will be 5 deliveries per hour to the site across the working day for approximately 1 working week, while outside this period there will be up to 10 deliveries of stone and aggregates per working day.

The temporary works on the turbine delivery route comprise primarily of stone/capping aggregate material deliveries after each area has been cleared and levelled, and these will occur for a short duration of a single day up to several days, depending on the extent of the area to be filled with the temporary road materials. It is intended that the contractor and TTM crew working on these areas will complete one area and barrier it off to prevent public access, and then move on to the next area, to minimise the overall extent of TTM/roadworks control zones on the turbine delivery route between Edgeworthstown and the wind farm site.

Following completion of the turbine delivery activity, the reinstatement will be undertaken in the same way, with the stone material removed and the areas at the side of the public road reinstated, including replacing the soils and roadside boundary features. Again, the works at each temporary widening site will be carried out on one area, and then move to the next, to minimise the impact of TTM./roadworks control on the network and road users.

Spoil (topsoil and subsoil) will be primarily managed on site and suitably stockpiled so that it can be used to profile/landscape the completed areas around the wind farm site and reinstate areas of temporary roads and compounds, therefore the haulage to off-site landfill on the road network will tend towards zero.

Grid connection works

It is proposed to construct an onsite 20kV substation within the wind farm site and to connect to one of three existing substations via a 20kV Medium Voltage underground grid connection (UGC).

As outlined in section 6.4.4 Mable met with LCC Roads Department as part of the pre-planning consultation and advised that the Grid Route is not part of the wind farm planning application, but Grid Route Options are a consideration in the preparation of the EIAR.

Three options have been considered as part of the grid connection works. These options are outlined below:

Option 1 - Connection to Existing Richmond 110kV Substation.

Option 2 - Connection to Existing Longford 38kV Substation.

Option 3 - Connection to Existing Glebe 38kV Substation.

A detailed description for each option is contained in the CEMP, and depending on the option selected the UGC will consist of approximately 5.9km or 8km of underground cable consisting of 1 No. 125mm diameter uPVC cable duct installed in an excavated trench, approximately 0.95m deep and 0.325m wide, with variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. The cable duct will accommodate 1 No. power cable.

The CEMP contains an overview of the grid connection routes as follows:

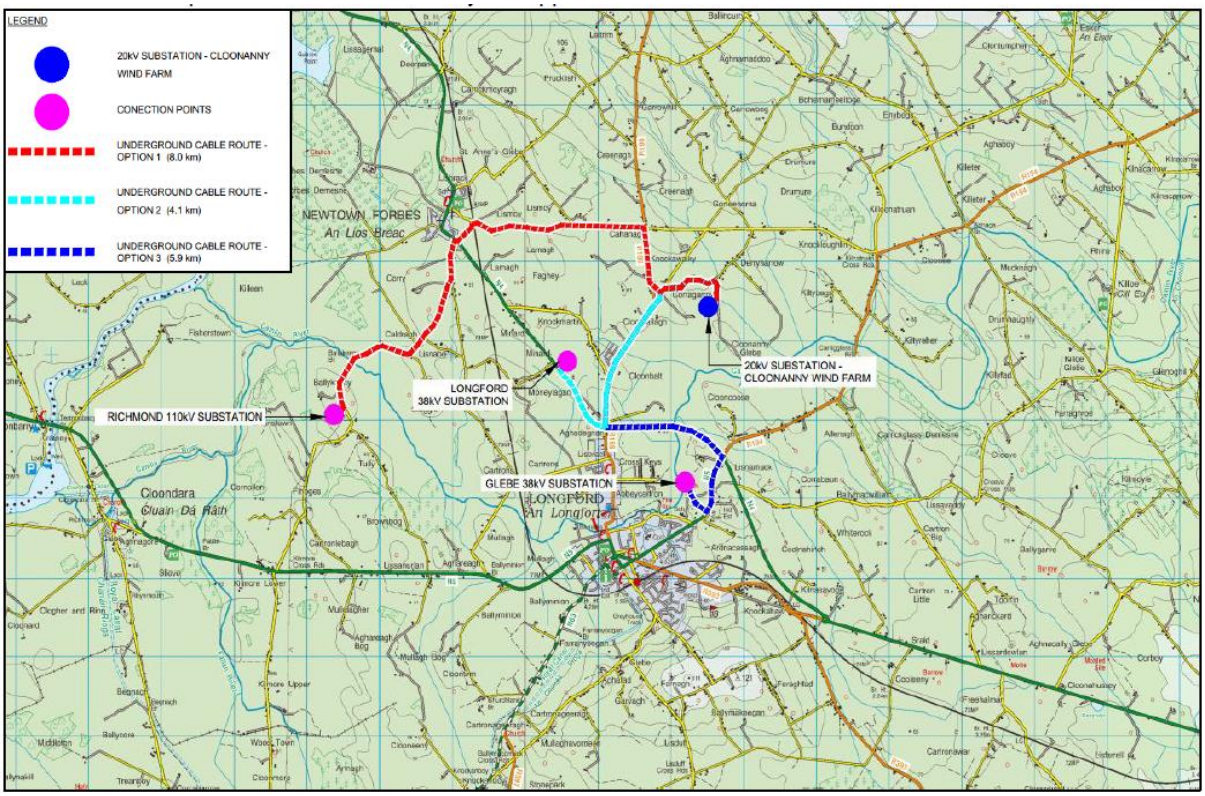

Figure 6-7 Grid Connection Route Options 1-3 (source: Mable CEMP)

LCC noted concerns with the extent of road that would be impacted by the construction of an underground route to the more westerly Richmond substation (the 8km route), and possible conflicting demands for capacity and access to substations from other renewable energy generation projects.

Mable agreed to discuss with the Developer and review the options for connecting to alternative Substations, as well as co-ordinating of any future Grid works with the other Renewable Energy projects being planned in the area.

All three of the proposed UGC route options would cross the emerging preferred corridor of proposed N4 upgrade project.

Mable have advised that the final agreed UGC would be installed at a suitable depth that it would not impact on the construction of the N4 scheme where it crosses the corridor, or in the event that the N4 scheme was constructed in advance of the UGC works, the construction methodology would comprise directional drilling under the N4 scheme so that operations and traffic on the new N4 route would be unaffected by the UGC works.

Any works to the public road to facilitate the grid connection would necessitate approval of a road opening licence application which would include a detailed traffic management plan. This, combined with the fact that the UGC would be underground, will mitigate potential negative effects and ensure that public safety is not endangered.

Table 6-2 Construction Traffic Increases on Road Links

Site Location	Percentage increase in 2-way total daily traffic volume (2 way total)
Site (1) R198 between N4 and L1018	0.26%
Site (2) L1011 between R198 and L1018	0.0%
Site (3) L1011 between L5046 and R194 Kiernan's Cross	3.46%
Site (4) R194 south west of Carrickglass roundabout	0.93%
N4 Longford Bypass to east of R194 Leo Casey Roundabout	0.35%

As set out in Table 6-2, typical construction activities at the Cloonanny wind farm site will result in some minor increases in traffic volumes of the key road links accessing the main wind farm site.

These levels of traffic increase are below the TII Traffic and Transport Assessment Guidelines trigger thresholds of 10% increase (or 5% in congested areas) and are not anticipated to result in any detrimental impacts on the Level of Service (LOS) provided on each road link or the operating capacity of each link.

The increase on the N4 to the east of the R194/Leo Casey Roundabout is a worst-case which assumes all deliveries arrive and depart on this route, while the increase on the R198 between the N4 and the L1018 assumes construction staff commuting trips from the local area of Longford Town will arrive and depart via the more direct route at the start and end of each working day.

These are worst-case scenario figures related to a 0% backloading operation in terms of soils excavation/stone delivery (assumes excavated/stripped soils are stockpiled on site and reused on site during the restoration and landscaping works).

While the highest percentage impact will occur on the L1011 (between Kiernans Cross and the L5046) and on the L5046 to the north of L50462 access junction, it should be recognised that this is against a very low baseline flow for a two-way local rural road.

From the foregoing, it is clear that the proposed development will not have any significant traffic impacts on the road network during the weekday peak periods or in terms of daily traffic flow, and the volume of off-peak movements are also at a level which will not result in operational issues for the road network or impact on road user safety (please refer to Table 6-3, where the effects are identified as slight or moderate).

6.8.2 Operational Phase

As outlined in Section 6.3.1, there are no significant traffic and transport aspects during the operating life of the proposed windfarm. On a daily basis, there are no regular traffic demands associated with the operating wind farm, and it is anticipated that there will only be occasional access to the site by a van or a small flatbed truck for routine maintenance of the facility, monitoring, or possible repairs to equipment, which will occur infrequently during the operating life of the wind farm. The effect will be neutral and will tend towards imperceptible.

6.8.3 Decommissioning

The windfarm has a proposed design life of 35 years, after which it could be decommissioned, or subject to further approvals from the relevant agencies, the operating life could be extended.

The potential traffic impacts associated with decommissioning will be partly the same as those associated with the construction phase. It is proposed that the turbine foundations and hardstanding areas are left in place and covered with local topsoil and revegetated. Access roads will remain in place and grid connection cables will be left in the ground. The removal of the substations. battery storage, meteorological mast, boundary fencing, and wind turbine equipment would require road transport from the site. If the blades and tower sections are kept intact then these would require long vehicle/abnormal load transport, with temporary revisions and accommodations to the future road network, as found at the time of the decommissioning).

The potential traffic impacts during decommissioning are therefore likely to be lesser than the construction traffic impacts, as some elements that were constructed (such as drainage and foundations) will not be removed from the site. A detailed traffic management plan and road opening licences will be agreed with LCC prior to the decommissioning and will have regard for the road network at the material time, which is expected to include the N4 Upgrade route between Mullingar and Longford (Roosky).

6.8.4 Cumulative Effects

As the traffic impacts of the Cloonanny windfarm development are all related to the construction phase with neutral levels of operational traffic predicted, post-construction and commissioning, longer term or 'design year' traffic impacts will be tending towards imperceptible for this project and therefore cumulative traffic impacts are not relevant after the completion of the construction activities.

It is noted from that review that there are no current permitted projects which are likely to have a material impact on the traffic volumes on the proposed delivery haul route via the R194, L1011 and L5046 (with a planning search on the LCC online portal identifying only minor domestic-related development for single dwellings, retention application or associated site development works within a 1.5km radius of the site (LCC Reg. Ref. 2413, 22177, 21331, 21117 and 19240).

There is a grant of permission for continuance of a quarry at Killoe (LCC ref: 2017), 4.5km to the northwest of the Cloonanny site, but it is considered that this would maintain the existing operations at that location and would therefore be no change to the 2024 baseline traffic flows in the receiving road network.

As noted at 6.8.3 above, Westmeath County Council, working in partnership with Longford County Council and in association with Transport Infrastructure Ireland, are in the process of developing a new N4 road scheme along a section of the N4 between Mullingar and Longford (Roosky). The scheme is currently at the emerging preferred route corridor stage.

The proposed wind farm development within the red line boundary does not interfere with the route corridor. The three Route Options for the proposed underground gird connection all pass through the emerging preferred route corridor, which runs between the existing N4 Longford Bypass and the wind farm site. The grid works will be designed to take this into account.

Prior to the commencement of the Grid connection works, the developer will liaise with TII and the overseeing agencies for the N4 Upgrade project to ensure that the Grid connection route does not create issues regarding the construction of the new road. An application will be made for appropriate Road Opening Licence(s) and a detailed Traffic Management Plan will be prepared for agreement with the Road Authority (LCC), ensuring potential effects are mitigated.

6.8.5 Summary

The following Table 6-3 summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 6-3 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from construction related traffic travelling to/from work sites, leading to increased vehicle queuing and delays at junctions.	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible delays to traffic at temporary traffic management areas at temporary construction areas, leading to increased vehicle travel times, possible queuing and delays.	Negative	Moderate	Local road network	Likely	Temporary	Direct
Possible traffic diversions due to temporary traffic management at temporary construction areas, leading to increased vehicle-km and travel times.	Negative	Moderate	Local road network	Likely	Temporary	Direct

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible traffic diversions or queuing due to temporary traffic management during transport of wind turbine components from port to site by road, leading to increased vehicle-km and travel times	Negative	Moderate	Local and National Road Network between Belview Port and Cloonanny Glebe staging site.	Likely	Temporary	Direct
Possible impact on non-vehicular traffic (pedestrians and cyclists) using L50462 during development works at Wind Farm/sub-station sites	Negative	Moderate	Local road network	Likely	Temporary	Direct

Table 6-4 summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 6-4 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from maintenance related access to site.	Neutral	Imperceptible	Local road network	Unlikely	Long term	Direct
Possible impact on non-vehicular traffic (pedestrians and cyclists) using L50462 from maintenance related activities	Neutral	Imperceptible	Local road network	Unlikely	Long term	Direct

Table 6-5 summarises the identified likely significant effects during the decommissioning phase of the proposed development before mitigation measures are applied.

Table 6-5 Summary of Decommissioning Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from decommissioning related traffic travelling to/from work sites, leading to increased vehicle queuing and delays at junctions.	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible delays to traffic at temporary traffic management areas at temporary works areas, leading to increased vehicle travel times, possible queuing and delays.	Negative	Moderate	Local road network	Likely	Temporary	Direct

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible traffic diversions due to temporary traffic management at temporary works areas, leading to increased vehicle-km and travel times.	Negative	Moderate	Local road network	Likely	Temporary	Direct
Possible traffic diversions or queuing due to temporary traffic management during transport of decommissioned wind turbine components from site by road, leading to increased vehicle-km and travel times	Negative	Moderate	Local and National Road Network between site and haulage destination.	Likely	Temporary	Direct
Possible impact on non-vehicular traffic (pedestrians and cyclists) using L50462 during decommissioning works at Wind Farm/sub-station sites.	Negative	Moderate	Local road network	Likely	Temporary	Direct

6.9 Mitigation Measures

6.9.1 Incorporated Design Mitigation

A number of design related measures are proposed to ensure road infrastructure is adequate to cater for the projected traffic during the Construction Phases.

A section of access road to the west of the existing L5046/L50462 junction will be constructed to accommodate both daily construction traffic to and from the wind farm site with improved exit sightlines and a fully constructed road specification with drainage measures, adequate to accommodate the expected loads and traffic volumes expected across the construction period,

The existing alignment of the L54062 from the L5046 junction will be retained as a non-trafficked route to accommodate pedestrian and cyclist activity using the L50462 as an access/leisure route.

The delivery haul route (via the N4 to the wind farm site) was selected with regard to the largest wind turbine components that will be delivered as abnormal load transport, route assessment carried out visually by Mable to identify existing constraints, and swept path assessments to determine the most appropriate measures requiring minimal interventions and temporary works along the selected route (via the R194, L1011 and L5046.

Where temporary construction and haul delivery junction exit sightlines for the design speed/posted speed limit of the existing road cannot be incorporated, it is proposed to implement temporary traffic management (TTM) measures as set out in the PTMP, which will be subject to detailed agreement with LCC as part of the Road Opening Licences that will have to be in place before works can commence.

Road surfaces on the public road will be reinstated as temporary works are completed, and temporary 'stone' areas for abnormal load delivery swept paths will be barriered off to prevent access by non-

construction road users. At interfaces between temporary works and public road areas, the Contractor will monitor and clean the road to ensure construction materials, spoil or stone from the temporary areas is not deposited onto the public road.

Construction staff parking will be accommodated within the compound at the wind farm site, and staff will not park their personal vehicles on the public road or at temporary works sites Staff working at temporary works sites will be transported to the work sites from the wind farm compound using a contractor van/flatbed truck (which will be accommodated within the controlled temporary works area so it is not parked on the public road).

These measures are proposed to ensure safety of road users and minimise traffic disruption during the construction Phases.

6.9.2 Construction Phase Mitigation

The PTMP is included in the Mable CEMP and incorporates traffic management measures for the construction stage and will be further developed and agreed with the planning authority in advance of any works being undertaken.

The hours of construction activity will be limited to avoid unsociable hours, where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs on weekdays and between 07:00hrs and 14:00hrs on Saturdays. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours or to accommodate delivery of large turbine components along public routes), it may be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with Longford Co. Co.

While 'out of hours' operational traffic activity for specialised or infrequent deliveries such as can result in temporary impacts such as increased construction traffic noise to receptors along the haul delivery road network, there is a key offset by reducing the impact on the overall road network, and particularly on the wider network where daytime temporary closures or diversions on the key National and Regional Roads forming most of the turbine delivery route would have a more significant impact on the existing network traffic at times when volumes are higher.

Adequate advance public information including advertising and promotion of any temporary works closures or diversions though social media, print media and websites (TII, AA Roadwatch, and Local Authorities) and adequate VMS (variable message signage) on approach routes to the site area and temporary accommodation works areas, and also for the turbine delivery activity will be key to minimising disruption to travel which can lead to queuing and increased vehicle emissions.

Based on information from similar previous projects, it is anticipated that approximately 25 persons will be directly employed during peak construction activities on the wind farm site with 5 persons directly employed during the grid connection works. Therefore, the day-to-day construction staff traffic generated by the main windfarm site during the two-year build period will not be significant. Where practical, construction staff will be encouraged to vehicle share car pool travelling to and from work sites.

It is intended that the topsoil and subsoil excavated at the windfarm and temporary accommodation works sites will be stored for reuse in reinstatement and landscaping works, to reduce the volume of waste and other materials transported off-site by road. Where materials such as construction related waste materials cannot be recycled and reused on site, these will be removed from site by backloading of delivery haulage vehicles where practical to avoid additional HGV trips.

A detailed CTMP for the construction phase will be agreed with LCC in advance of construction commencing. As set out in the PTMP prepared or the planning application, this will include:

- Appointment of a Traffic Management Coordinator
- Engagement/Liaison with locals
- Pre-condition survey
- Road opening licence for any temporary or permanent works on or adjacent to the public roads (and for Grid connection works)

Adherence to the CTMP and any Temporary Traffic Management (TTM) measures in place at worksites (including management of construction related vehicles to ensure there is no inappropriate parking or loading/unloading on public roads), and strictly following agreed haulage delivery routes, which will be monitored by the Project Management Team throughout the construction period.

Reinstatement of the temporary accommodation works areas (where widening or bend overswing areas are required to assist the turbine delivery areas) after these delivery activities are complete will return the road network to the 'Do Nothing' current condition.

6.9.3 Operational Phase Mitigation

There will be minimal post-development traffic generated by the wind farm site when it is operational, which will be related to routine maintenance and repairs. This level of traffic would be infrequent and only result in one or two van or small truck movements in a particular day, occurring only occasionally over the proposed 35-year operating design life.

Where practical, operational maintenance staff will be encouraged to vehicle share car pool travelling to and from the site.

Sightlines will have to be maintained at the access from the L50462 to the substation and wind turbine sites. Where vegetation and foliage regrowth occurs within the public road area, this can be undertaken by the local authority as part of routine road maintenance activities, while any maintenance within the operator's lands/private lands would be undertaken by the operator/landowner.

6.9.4 Decommissioning Phase Mitigation

A decommissioning plan will be prepared for agreement with LCC including a traffic management plan and mitigation measures similar to those implemented during the construction phase will be put in place.

6.10 Residual Impact Assessment

6.10.1 Construction Phase

As with all construction projects where there is traffic activity and works adjacent to live roads, there will be residual traffic impacts due to delivery traffic and construction worker commuting traffic on the public road network, and also due to temporary and wind farm/substation work sites which are on or adjacent to, the public road network.

These can be managed adequately and the significance of impacts reduced from moderate impact to slight impact if the correct mitigation measures including procedures and practices which will follow the agreed CMTP are maintained and followed during the construction phase.

6.10.2 Operational Phase

No significant residual traffic impacts are expected during the operational phase following the implementation of the mitigation measures.

6.10.3 Decommissioning Phase

As with all decommissioning projects where there is resultant traffic activity and works adjacent to live roads, there will be residual traffic impacts due to haul traffic and worker commuting traffic on the public road network, and also due to temporary and wind farm decommissioning work sites which are on or adjacent to, the public road network.

These can be managed adequately and the significance of impacts reduced from moderate impact to slight impact if the correct mitigation measures including procedures and practices which will follow the agreed decommissioning CTMP are maintained and followed during the decommissioning phase.

6.10.4 Summary of Post-Mitigation Effects

Table 6-6 summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 6-6 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from construction related access to site,	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible traffic queuing from temporary traffic management areas at temporary construction areas.	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible traffic diversions due to temporary traffic management or	Negative	Slight	Local road network	Likely	Temporary	Direct

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
temporary road closures at temporary construction areas, leading to increased vehicle-km on the road network						
Possible traffic diversions or queuing due to temporary traffic management during transport of wind turbine components from port to site by road, leading to increased vehicle-km on the road network.	Negative	Slight	Local and National Road Network between Belview Port and Cloonanny Glebe staging site.	Likely	Temporary	Direct

Table 6-7 summarises the identified likely significant residual effects during the operational phase of the proposed development following the application of mitigation measures.

Table 6-7 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from maintenance related access to site, leading to increased traffic queuing at junctions.	Neutral	Imperceptible	Local road network	Unlikely	Long term	Direct
Possible impact on non-vehicular traffic (pedestrians and cyclists) using L50462 during operational conditions at Wind Farm/sub-station sites.	Neutral	Imperceptible	Local road network	Unlikely	Long Term	Direct

Table 6-8 summarises the identified likely residual effects during the decommissioning phase of the proposed development following the application of mitigation measures.

Table 6-8 Summary of Decommissioning Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Possible Increased traffic volumes from decommissioning related traffic travelling to/from work sites, leading to increased vehicle	Negative	Slight	Local road network	Likely	Temporary	Direct

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
queuing and delays at junctions.						
Possible delays to traffic at temporary traffic management areas at temporary works areas, leading to increased vehicle travel times, possible queuing and delays.	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible traffic diversions due to temporary traffic management at temporary works areas, leading to increased vehicle-km and travel times.	Negative	Slight	Local road network	Likely	Temporary	Direct
Possible traffic diversions or queuing due to temporary traffic management during transport of decommissioned wind turbine components from site by road, leading to increased vehicle-km and travel times	Negative	Slight	Local and National Road Network between site and haulage destination.	Likely	Temporary	Direct
Possible impact on non-vehicular traffic (pedestrians and cyclists) using L50462 during decommissioning works at Wind Farm/sub-station sites.	Negative	Slight	Local road network	Likely	Temporary	Direct

6.10.5 Cumulative Residual Effects

No significant traffic or transport related cumulative effects are expected to occur.

6.11 Risk of Major Incidents or Disasters

No significant environmental risks from major accidents or disasters are anticipated during the development and operation of the wind farm. This conclusion is based on comprehensive risk assessments and the implementation of robust mitigation strategies.

The project design incorporates best practices to prevent incidents, including proper handling and storage of hazardous materials, a robust construction traffic management plan, use of experienced Temporary Traffic Management and Control and specialist transportation haulage companies with experience of transporting large wind turbine equipment, following a detailed and approved method

statement and traffic plan which has been agreed by all relevant agencies, and strict adherence to environmental protection guidelines and regulations

6.12 Worst Case Scenario

If the proposed development goes ahead and the suggested mitigation measures proposed as part of the detailed traffic management plan to be operated during construction and/or decommissioning phases fail, it is likely to have a significant impact on traffic resulting in temporary effects until such time as these can be adjusted/corrected by the Project Team and CTMP/TTM co-ordinator.

The anticipated low level of operational traffic generated by the proposed wind farm is expected to have a neutral effect which is tending towards imperceptible, and the mitigation measures relating to access from the L50462 public road into the wind farm sites are not expected to res

Traffic impacts due to failure of or damage to the installed UGC during the operational life of the project, while unexpected, could result in temporary effects due to road opening works and associated temporary traffic management on a section of the public road to undertake emergency repairs.

6.13 Interactions

Increased traffic generation particularly from construction related HGVs for projects requiring significant volumes of materials haulage can result in impacts on air quality and noise. Also, temporary traffic management and temporary road closures could result in queuing of traffic or diversions to traffic causing localised impacts on air quality and noise. These are addressed in the relevant chapters of this EIAR.

6.14 Monitoring

Monitoring is essential for reducing the risks associated with mitigation measures in a wind farm development project because it ensures that these measures are functioning as intended and can be adjusted if needed.

Regular monitoring allows for the early identification of issues such as road pavement surface deterioration, control failure, structural damage to roadside features or bridges, vegetation growth impacting on access and junction sightlines, or warning signage being damaged or dirty, which could compromise mitigation efforts.

By detecting problems early, corrective actions can be taken before they escalate into major incidents or environmental impacts.

6.14.1 Construction Phase

A detailed CTMP will be prepared in due course with reference to the preliminary TMP prepared by Mable for the planning application and this will be implemented in conjunction with the requirements of the Local Authority Roads Departments and the TII. Good record keeping on deliveries, and a requirement for vehicle tracking data for large loads will confirm that all haulage operators are

following the agreed procedures and routes to and from the wind farm site and the temporary accommodation works sites, including a log of delivery times, dates and loads transported.

An initial visual inspection and record photographs of road pavement conditions and existing road signage from the N4 to the wind farm site via the proposed delivery haul route will be completed to provide a benchmark and regular agreed monitoring after periods of high-volume delivery activities (stone and concrete deliveries, and wind turbine deliveries), will identify any issues so that measures can be implemented in a timely manner.

6.14.2 Operational Phase

As noted previously, the operational traffic will have an imperceptible impact on the road network so no further monitoring will be required.

6.14.3 Decommissioning Phase

This will be similar to the construction (albeit the impacts will occur over a shorter period) and it is expected that the foundations for the substation, met mast and wind turbine will remain in place and be landscaped over.

A detailed CTMP and similar monitoring including road pavement condition inspection will have to be put in place prior to any decommissioning related traffic activities and the method of haulage off-site will be dependant on the methodology for deconstructing the towers and blades (i.e. if these are to be removed in full section sizes or broken down to be carried on standard articulated flatbed trucks).

Following decommissioning, the area and roads would have to be reinstated with a further visual assessment and record photographs of the road pavement, boundary treatments and road signage.

6.15 Summary of Mitigation and Monitoring

The following Table 6-9 summarises the Construction Phase mitigation and monitoring measures.

Table 6-9 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Possible increased traffic volumes from construction related access to site, leading to reduced level of service on road links and operating junction capacity.	Construction deliveries to follow agreed route only, with route signage and warning signs at site access from public road. Construction worker parking to be within site compound.	Contractor to carry out ongoing route checks to monitor deliveries and construction workier parking activity. Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.
Possible traffic queuing from temporary traffic management areas at temporary construction areas, leading to reduced level of service on road links and operating junction capacity.	Effective planning and project programme control of temporary works activities to minimise time that TTM measures, shuttle working, closures or diversions are required,	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.

Likely Significant Effect	Mitigation	Monitoring
	with measures requiring closures programmed for times of the day when there are lower traffic volumes (i.e. avoiding commuter peak/school run periods).	
Possible traffic diversions due to temporary traffic management at temporary construction areas, leading to increased vehicle-km and journey times for road users.	Advanced notifications of temporary work periods, possible closure and/or diversions to be well advertised to public through LCC and various social media channels. Effective planning and project programme control of temporary works activities to minimise time that TTM measures, shuttle working, closures or diversions are required, and co-ordination with LCC to carry out works to minimise traffic disruption.	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.
Possible traffic diversions or queuing due to temporary traffic management during transport of wind turbine components from port to site by road, leading to increased vehicle-km and journey times for road users.	Advanced notifications of temporary closure and/or diversions to be well advertised to public through LCC and various social media channels. Effective planning and project programme control of turbine delivery activities to minimise time that TTM measures, shuttle working, closures or diversions are required, and co-ordination with LCC/TII and other road authorities on the route from Belview Port to the wind farm site to carry out deliveries to minimise traffic disruption.	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.

The following Table 6-10 summarises the Operational Phase mitigation and monitoring measures.

Table 6-10 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
No expected significant traffic effects.	None required	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.

The following Table 6-11 summarises the Decommissioning Phase mitigation and monitoring measures.

Table 6-11 Summary of Decommissioning Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Possible increased traffic volumes from decommissioning related traffic access to site, leading to reduced level of service on road links and operating junction capacity.	Decommissioning related HGVs to follow agreed route only, with route signage and warning signs at site access from public road. Construction worker parking to be within site compound.	Contractor to carry out ongoing route checks to monitor HGV routes and construction workier parking activity. Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.
Possible traffic queuing from temporary traffic management areas at temporary works areas, leading to reduced level of service on road links and operating junction capacity.	Effective planning and project programme control of temporary works activities to minimise time that TTM measures, shuttle working, closures or diversions are required, with measures requiring closures programmed for times of the day when there are lower traffic volumes (i.e. avoiding commuter peak/school run periods).	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.
Possible traffic diversions due to temporary traffic management at temporary works areas, leading to increased vehicle-km and journey times for road users.	Advanced notifications of temporary work periods, possible closure and/or diversions to be well advertised to public through LCC and various social media channels. Effective planning and project programme control of temporary works activities to minimise time that TTM measures, shuttle working, closures or diversions are required, and co-ordination with LCC to carry out works to minimise traffic disruption.	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.
Possible traffic diversions or queuing due to temporary traffic management during transport of wind turbine components from site to future destination by road, leading to increased vehicle-km and journey times for road users.	Advanced notifications of temporary closure and/or diversions to be well advertised to public through LCC and various social media channels. Where possible, large elements which are not being re-used elsewhere, can be broken down on site and transported from the site on standard HGVs, reducing the amount of abnormal load transport movements from the site.	Public liaison officer to report to client and contractor of any feedback from LCC or members of the public.

	Effective planning and project programme control of turbine component transport activities to minimise time that TTM measures, shuttle working, closures or diversions are required, and co-ordination with LCC/TII and other road authorities on the route from the site to the destination to undertake with minimal traffic disruption.	

6.16 Conclusion

The proposed development has been thoroughly assessed with respect to its potential impacts on the environment with regard to traffic and transport. During the construction, operational and decommissioning phases, the primary risks identified include construction related traffic impacting on the safety, carrying capacity and road pavement conditions along the key haul route and through the temporary accommodation works areas along the delivery haul route.

During the construction phase and to a lesser extent during the decommissioning phase, the primary concern is the potential for vehicle queuing and delay, resulting in increased vehicle-km and/or emissions. Mitigations, such as proper CMTP and TTM practices, are expected to significantly reduce the likelihood of any significant adverse impacts.

During the operational phase, the risk of traffic impact is imperceptible with only occasional access required to the site for routine maintenance or repair procedures.

After implementing all mitigation measures, the residual impacts on traffic and transport are expected to be slight and localised. There will be no significant change in the volume of traffic on a day-to-day basis during construction and imperceptible change in traffic during the operational life.

The traffic management and control systems proposed for the site, combined with ongoing monitoring, ensure that the development will not have a detrimental effect on the local road network environment. The project has been designed in line with best practice environmental standards, and no long-term significant adverse effects on the local road environment are anticipated.

In conclusion, with the implementation of the comprehensive mitigation strategies outlined in this report, the proposed development will have no significant residual impacts on the road network for road users.

6.17 References and Sources

- *Guidelines on the Information to be Contained in Environmental Impact Statements* (Environmental Protection Agency, 2022)
- *Guidelines for Traffic & Transport Assessments* PE-PDV-02045 (Transport Infrastructure Ireland, 2014).
- *Longford County Development Plan 2021-2027 (Longford County Council)*
- *Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions)* DN-GEO-03060 (Transport Infrastructure Ireland, May 2023)
- *Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections* PE-PAG-02017 (transport Infrastructure Ireland, October 2021)
- *Cloonanny Windfarm Construction & Environmental Management Plan*, (Mable Consulting Engineers, September 2024)
- *Traffic & Transport Assessment for Cloonanny Windfarm, (Stephen Reid Consulting Traffic & Transportation, September 2024)*
- TII Permanent Traffic Counter data on N4 Longford Bypass (source: https://trafficdata.tii.ie/, September 2024)

CHAPTER 7
MATERIAL ASSETS: BUILT SERVICES

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DECEMBER 2024

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7 Material Assets: Built Services

7.1 Introduction

This Chapter describes material assets that are potentially impacted by the proposed development.

The purpose of this assessment is to identify relevant material assets that are within the vicinity of the development site or will be utilised by the development, to determine the impact, if any, on these resources, and propose mitigation where necessary to ensure that they are used in a sustainable manner. The Elements of the project are discussed where relevant under appropriate sections of this chapter.

7.1.1 Expertise & Qualifications

This chapter of the EIAR has been prepared by Mr. Barry McGinn and Mr. Eoin Roche of Mable Consulting Engineers Limited in conjunction with the Engineering Department of Ai Bridges, and in conjunction with Mr. Jonathan Coffey of Natural Forces.

Barry is a Chartered Engineer with over 27 years' experience in the design, construction and project management of civil and structural engineering projects including; Wind Farms, Solar Farms, Battery Storage, Electrical Substations, Flood Alleviation, and multiple other development types.

Barry is a Member of Institution of Engineers Ireland and holds the following qualifications:-Advanced Diploma in Planning and Environmental Law (Distinction), King's Inns Dublin;

- Post Grad. Diploma Construction Law & Contract Administration (Distinction), Trinity College Dublin;
- Post Grad. Dip. Project Management (Merit), Trinity College Dublin;
- Bachelor of Science in Engineering (Upper Second-Class Honours), Trinity College Dublin;
- Diploma in Structural Engineering (Distinction), DIT Bolton St. Dublin;
- Diploma in Civil Engineering (Distinction), DIT Bolton St. Dublin.

Barry has worked on the design, construction and energisation of Wind Farm, Electrical Substation and Grid Connection Projects throughout Ireland including:

- Ballybay, Foyle & Cnoc Wind Farms (35 MW, 15 No. Turbines, 3 No. 20kV Substations);
- Ballynahulla ESB 220KV and 110kV GIS Substations (Part on Bog);
- Blanchfield ESB 38kV Substation;
- Blanchfield to Thurles 38kV Underground Grid Connection (30km in Public Road);
- Killymallaght 110kV NIE Substation Extension (Live Substation);
- Crighshane & Church Hill Wind Farms (50MW, 22 No. Turbines, 2 No. 20kV Substations, Part on Bog);

- Magherakeel 110kV AIS NIE Substation (Part on Bog);
- Crockagarran Wind Farm Phase 1 & 2 (17.5MW, 22 No. Turbines, 2 No. 20kV Substations, Part on Bog);
- 38kV ESB Electrical Substation refurbishment and upgrades at Kingscourt, Edgeworthstown, Castlerea, Stranorlar & Monaghan (Live Substations);

Barry founded Mable Consulting Engineers in 2022 providing environmentally responsible and sustainable engineering services to clients in both the public and private sectors. Previously he worked as a Director in DRA Consulting Engineers, Construction Manager in Gaelectric Developments. Ltd., Contract Manager in Adman Civil Projects Ltd. and Associate in Thomas Garland & Partners Consulting Engineers. With the above qualifications and work experience Barry has gained expert knowledge and competency in the design and development of Wind Farm, Turbine Transport Route and Grid Connections and the assessment of the impact of these on Built Services.

Mr. Eoin Roche (B.Eng), the co-author of this chapter, holds a Bachelor of Engineering (Hons) in Structural Engineering and a Postgraduate Diploma (Distinction) in Sustainable Energy and the Environment. With four years of experience, Eoin has been involved in the design and construction of a diverse range of civil and structural engineering projects. His knowledge spans several critical areas of renewable energy infrastructure, including wind farms, solar farms, battery energy storage systems (BESS), synchronous compensators, and electrical substations. Eoin's multidisciplinary background and experience in both traditional engineering and sustainable energy solutions enable him to effectively and accurately address the environmental and technical considerations of this chapter.

7.1.2 Proposed Development

A brief summary of the development is outlined below. A detailed description of the proposed development is contained within Chapter 2 of this EIAR and the Planning Statement that accompanies the application. The statutory notices should also be referred to.

A 10-year permission is being sought by Natural Forces Renewable Energy 2 Limited for the development of a 14MW wind farm on lands measuring 17.28ha located at the L5046 and L50462 in the townlands of Cloonanny Glebe, Corragarrow, Derryharrow and Gorteenorna, Co. Longford.

The proposed development will consist of the following:

(i) Demolition of a single-storey derelict shed structure (c. 93 sqm GFA) to facilitate the turbine haul route

(ii) Construction of two E175 EP5 wind energy converters, each with an electrical rating of 7MW, an overall ground-to-blade tip height of 199.9 metres, a rotor blade diameter of 175 metres, hub height of 112.4 metres, associated foundations and hard-standing areas;

(iii) Construction of an 800m permanent internal site access road which will run from the L50462 to the wind energy converter hardstanding areas including a 9.1m clear span bridge crossing a local stream;

(iv) Construction of 1 No. meteorological mast with a height of 32 metres, associated foundation and hardstanding area;

(v) Construction of 1 No. 20kV substation compound comprising 2 No. Modular Buildings each measuring 13.5 sqm in area and 3.5m in height, a Battery Energy Storage System (BESS) comprising 3 storage modules with a height of 2.8 metres and associated electrical works, foundation and hardstanding area;

(vi) Temporary alterations to the L5046 and L50462 public roads and temporary access roads to facilitate the turbine component haul route, including temporary widening of sections of the L5046 and L50462.

(vii) Installation of underground collector circuit and communications cabling in underground cable trenches, from the proposed wind energy converter to the proposed on-site substation;

(viii) All associated and ancillary site development, excavation, construction, and reinstatement works, including the provision of a temporary construction compound, site drainage, spoil management, fencing, lighting, hedge and operational maintenance and tree trimming and cutting.

(ix) This application is seeking a 35- year operational life from the date of commissioning of the entire wind farm.

The grid connection from the proposed on-site substation to the national electricity grid does not form part of the subject planning application. However, as part of the planning application process, this EIAR addresses three potential grid connection options currently considered to ensure a comprehensive environmental assessment of all aspects of the Proposed Development. The grid connection will be via 1 of the 3 potential options outlined below:

- Option 1 Connect the proposed development via (8.03km) to Richmond 110kV Substation
- Option 2 Connect the proposed development via (3.96km) to Longford 38kV Substation
- Option 3 Connect the proposed development via (5.85km) to Glebe 38kV Substation

It is anticipated that the grid connection from the Proposed Development will be by means of an underground cable connecting to one of the Substations identified above via the public road network. For bridge crossings, the cable will be located within the bridge deck, where there is insufficient depth and width available horizontal directional drilling (HDD) will be employed as an alternative.

Once the preferred route emerges it will be determined whether the grid connection falls within the category of exempted development under Class 26 of Schedule 2 in the Planning and Development Regulations 2001, as amended or requires planning permission, in which case an application will be made to the planning authority.

All elements of the proposed development as outlined above together with the turbine delivery route and grid connection options have been assessed as part of this EIAR.

7.1.3 Scope of Assessment

The Environmental Protection Agency's (EPA) '*Guidelines on the information to be contained in an Environmental Impact Assessment Report*' (EPA, 2022) was consulted as part of preparation of this assessment. The EPA Guidelines describes material assets to be taken to mean 'Built Services' (i.e. utilities networks including electricity, telecommunications, gas, water supply and sewerage), 'waste management' and 'infrastructure' (e.g. roads and traffic).

Table 7-1 outlines the topics which the EPA guidance documents suggest may be examined as part of the material assets impact assessment.

Material Asset	Topics to be Covered
Built Services	Electricity Telecommunications Gas Water Supply Infrastructure Sewerage
Roads & Traffic	Construction Phase Operational Phase Unplanned Events (i.e. Accidents)
Waste Management	Construction Phase Operational Phase

Table 7-1 – Material Assets and Topics to be included (EPA Guidelines)

The consideration of the projects impact on Material Assets provided within this Chapter is discussed in the context of the following Built Services:

- Electrical infrastructure & supply;
- Telecommunications;
- Aviation;
- Gas;
- Water and wastewater infrastructure.
- Waste Management

7.2 Methodology

The methodology of the assessment for each material asset comprises of:

1. **Existing Receiving Environment:** Identifying baseline conditions of the existing receiving environment and the receptors that have potential to be affected by changes in the baseline conditions;
2. **Do-Nothing:** Predicting and assessing the effects on the receptors if the development was not to proceed;
3. **Potential Significant Effects:** Predicting and assessing the potential significant effects on the receptors during construction, operational, and decommissioning stage, including cumulative effects;
4. **Mitigation Measures:** Identifying and assessing appropriate mitigation measures to avoid or reduce potential adverse effects;
5. **Residual Impact Assessment:** Assessing the significance of residual effects, taking account of any mitigation measures;
6. **Summary of Impacts/ Effects:** Provide a summary of the impacts and effects for each stage of the development, including cumulative and residual effects.

For each phase of the proposed development the effects on the relevant material assets have been separated and examined under the following headings:

- Development Site;
- Turbine Delivery Route;
- and Grid Route.

The study including desk-based research and site visits was carried out to compile the information on the local receiving environment and the proposed development.

The study included the following activities:

- Review of Design Drawings & Reports;
- Review of Ordnance Survey Mapping and aerial photography;
- Review of the Longford County Development Plan 2023-2029;
- Review of the following sources for information regarding existing utilities:
    - Gas Networks Ireland Dial Before You Dig Maps (DBYD);
    - ESB Dial Before You Dig Maps (DBYD);
    - EIR eMaps open eir Civil Engineering Infrastructure Service;
    - Uisce Éireann Utility Mapping
    - Longford County Council Drainage Records
- Site Visit to assess/ confirm the observations made during review of public records.
    - Date of Development Site Visit/ Survey: 16th January 2024
    - Date of Turbine Delivery Route Visit/ Survey: 16th January 2024
    - Date of Grid Route Option 1 Visit/ Survey: 13th February 2024 & 27th April 2024
    - Date of Grid Route Option 2 Visit/ Survey: 21st November 2024
    - Date of Grid Route Option 3 Visit/ Survey: 27th April 2024

7.2.1 Relevant EPA Guidance & Relevant Legislation

The following EPA guidance and legislation was consulted as part of the preparation of this assessment.

- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU;
- Guidelines on Information to be contained in environmental impact assessment reports (2022);
- European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017).

7.2.1.1 Assessment Criteria

The definition and assessment of effects were made in accordance with the criteria and terminology outlined in the 'Guidelines on the information to be contained in Environmental Impact Assessment Reports EIAR' (EPA, 2022).

7.2.2 Study Area

The Study Area is outlined in **Chapter 1 – Introduction** of the EIAR. The study area refers to the area of the proposed development, the area along the three grid route options outlined in **Chapter 2 – Development Description** of the EIAR, as well as Built Services infrastructure that adjoins the planning boundary of the proposed development.

7.3 Difficulties Encountered

No difficulties were encountered during the writing of this chapter.

7.4 Electrical Infrastructure and Supply

7.4.1 Existing Receiving Environment

EirGrid is the national electricity Transmission Systems Operator (TSO) in Ireland. In its role as TSO, EirGrid is responsible for the grid infrastructure required to support the development of Ireland's economy. EirGrid's Transmission Development Plan (TDP) 2021-2030 is the plan for the development of the Irish transmission network and interconnection over the ten years from 2021. This ten-year plan presents projects that are needed for the operation of the transmission network. The grid developments have been planned to ensure that the intended grid reinforcements facilitate the connection of significant amounts of wind generation.

The plan sets out a number of planned reinforcement projects for the Transmission Network in County Longford, including redevelopment of the 110 kV Station at Lanesboro. The development strategy has stated that it is vital that new electricity infrastructure is built to ensure that the region meets the standards required for a safe and secure electricity system and to cater for connecting the electricity generated by the region's huge renewable energy resources.)

Following a review of the ESB Networks Ireland Dial Before You Dig (DBYD) maps, it was observed that both underground and overhead electrical cables are present along the grid route options and in the vicinity of the site.

There are no underground/ overground electrical infrastructure on the proposed development site.

Three substations within 8km of the proposed development have been identified as potential connection points:

- Richmond 110kV Substation;
- Longford 38kV Substation;
- Glebe 38kV Substation.

Further detail on the grid options are given in **Chapter 2 – Development Description** of this EIAR.

7.4.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no potential for impact on local electrical infrastructure. The opportunity to generate renewable energy and supply electricity to the national grid would be lost. This would also prevent the offsetting of fossil fuel-based electricity generation.

7.4.3 Potential Significant Effects

7.4.3.1 Construction Phase

7.4.3.1.1 Development Site

Based on the review of the ESB DBYD, there are no underground/ overground electrical infrastructure on the proposed development site. The development will have ***Neutral Effect*** on underground/ overground electrical infrastructure during the construction phase.

7.4.3.1.2 Turbine Delivery Route

The relocation/ alteration of electrical poles will be required to accommodate the delivery of turbine components during the construction stage. This could lead to temporary power outages affecting local area. This will ***Likely*** lead to a ***Negative, Not Significant,*** and ***Temporary Effect*** on local electrical infrastructure.

7.4.3.1.3 Grid Route

There is underground electrical infrastructure along the 3 grid route options. It is likely that localised sections of services may require alteration/ relocation works to accommodate the installation the proposed cable route from the proposed development. This could lead to temporary power outages affecting local area. Alteration/ relocation works are ***Likely*** to lead to ***Negative, Slight,*** and ***Temporary Effects*** on electrical infrastructure.

There is a risk that machinery might inadvertently strike unknown underground services, leading to damage to existing electrical cables and subsequent outages. This would result in ***Negative, Slight, and Temporary Effects*** on local infrastructure.

During connection to the national grid or upgrading of substations to accommodate the development's 20kV connection, minor disruptions to the local electrical supply may occur. Temporary outages or capacity constraints are ***Likely,*** resulting in ***Negative, Slight,*** and ***Temporary Effects*** during the construction phase.

7.4.3.2 Operational Phase

7.4.3.2.1 Development Site

During the operational phase, the development will positively contribute to the national grid, enhancing the reliability and stability of the electricity supply by generating renewable energy. This will help meet national electricity demand while supporting Government energy and environmental policies. The proposed development is ***Likely*** to have a ***Positive, Slight,*** and ***Long-Term Effect*** on the grid capacity and local electrical infrastructure, aiding the region's sustainable energy transition.

The development will have a ***Neutral Effect*** on underground/ overground electrical infrastructure during the operational phase.

7.4.3.2.2 Turbine Delivery Route

The turbine delivery route will have ***Neutral Effects*** on underground/ overground electrical infrastructure during the operational phase, as no further disruptions are anticipated.

7.4.3.2.3 Grid Route

The installed cable route will have ***Neutral Effects*** on underground/ overground electrical infrastructure during the operational phase, as no further disruptions are anticipated.

7.4.3.3 Decommissioning Phase

7.4.3.3.1 Development Site

The development will have a ***Neutral Effect*** on underground/ overground electrical services during the decommissioning phase.

7.4.3.3.2 Turbine Delivery Route

The decommissioning stage requires the removal of turbine components from site. Similar to the construction stage the relocation/ alteration of electrical poles may be required to accommodate the removal of turbine components during the decommissioning stage. This is ***Likely*** to lead to a ***Negative, Not Significant,*** and ***Temporary Effect*** on local electrical infrastructure.

7.4.3.3.3 Grid Route

It is proposed to leave underground cable ducts in situ, as this minimizes environmental disruption. The grid route is expected to result in ***Neutral Effect*** during the decommissioning phase as no additional disturbances to existing electrical infrastructure will occur.

7.4.3.4 Cumulative Effects

There are no other proposed developments in the immediate vicinity, meaning cumulative impacts on local electrical infrastructure during the construction phase are not expected. However, in a national context, the cumulative effect of multiple renewable energy projects will contribute positively to the overall energy supply, helping to replace fossil fuel generation and reduce carbon emissions.

7.4.4 Mitigation Measures

To minimize potential significant effects on electrical infrastructure, a number of mitigation measures will be implemented. These mitigation measures can be described as the following:

- Mitigation by design;
- Mitigation by appropriate construction methodology.

7.4.4.1 Mitigation by design

- **Turbine Delivery Route:** As far as practicable the turbine delivery route has been designed to avoid existing overground electrical infrastructure cables, reducing the potential for conflict.
- **Grid Route Design**: As far as practicable the underground Grid Connection route will be designed to avoid existing underground electrical infrastructure cables, reducing the potential for conflict.
- **Design Standards**: The development will be designed to relevant codes of practice and standards for each part of infrastructure which is to be installed/ constructed.

7.4.4.2 Mitigation by appropriate construction methodology

- **Utility Provider Coordination**: The developer will liaise with utility providers to ensure all services are identified, and safe practices are employed during excavation near underground services;
- **Utility Provider Guidelines**: Compliance with all relevant service provider guidelines, including safe working procedures near live electrical infrastructure, will be enforced;
- **Confirmatory Survey**: Prior to construction, a confirmatory survey of all existing services will be conducted to verify and identify the precise location of underground and overhead services;
- **Hand Digging**: Excavation around identified services will be carried out by hand where necessary to minimize the risk of accidental damage;
- **Backup Services for Relocated Poles**: Backup services, such as mobile units, may be arranged if telecommunications poles are temporarily relocated, minimizing disruption to the local network;
- **Post-construction Testing and Validation**: After construction, a full survey will confirm that no services have been disrupted. If disruptions are found, the developer will work with utility providers to restore functionality before operations begin.

7.4.5 Residual Impact Assessment

The mitigation measures significantly reduce the risk of potential effects on electrical infrastructure. However, they do not completely eliminate the possibility of impacts. The implementation of appropriate mitigation in the design and construction methodology will reduce the duration of effects from Temporary to **Brief**. The significance of the effects will remain the same as outlined in Section 7.3.3.

7.5 Telecommunications

As part of the assessment of the potential effects of the proposed development on Telecommunications, AI Bridges were consulted to carry out an EMI Impact Assessment Report. This is contained in **Error! Reference source not found.**.

7.5.1 Existing Receiving Environment

7.5.1.1 Point to Point Radio Links

Ai Bridges carried out an assessment on the electromagnetic interference on point-to-point radio links in the vicinity of the proposed development this assessment is contained in **Error! Reference source not found.**, which also identified key television and telecommunications infrastructure in the vicinity of the proposed development. The assessment found that there are twelve telecom operators with networks in the vicinity of the site, with six that require a detailed technical analysis:

- 2RN Network
- Enet Network
- Imagine Broadband Network
- Three Ireland Network
- Vodafone Network
- Eir Network

A summary of the above networks are outlined in subsequent tables, along with their respective plan views showing the network layouts relative to the proposed development. Full detail on each network is contained in **Error! Reference source not found.**

The 2RN network in the vicinity of the proposed wind farm consists of one DTT Off-air radio link and one PTP microwave radio link. The radio links are listed in Table 7-2 below and a Plan View of the 2RN network is shown in Figure 7-1.

Link No.	Operator	Link Description
1	2RN	UHF DTT off-air radio link from Cairn Hill to Maghera
2	2RN	PTP microwave radio link from Cairn Hill to Coolderry

Table 7-2 - 2RN Radio Links

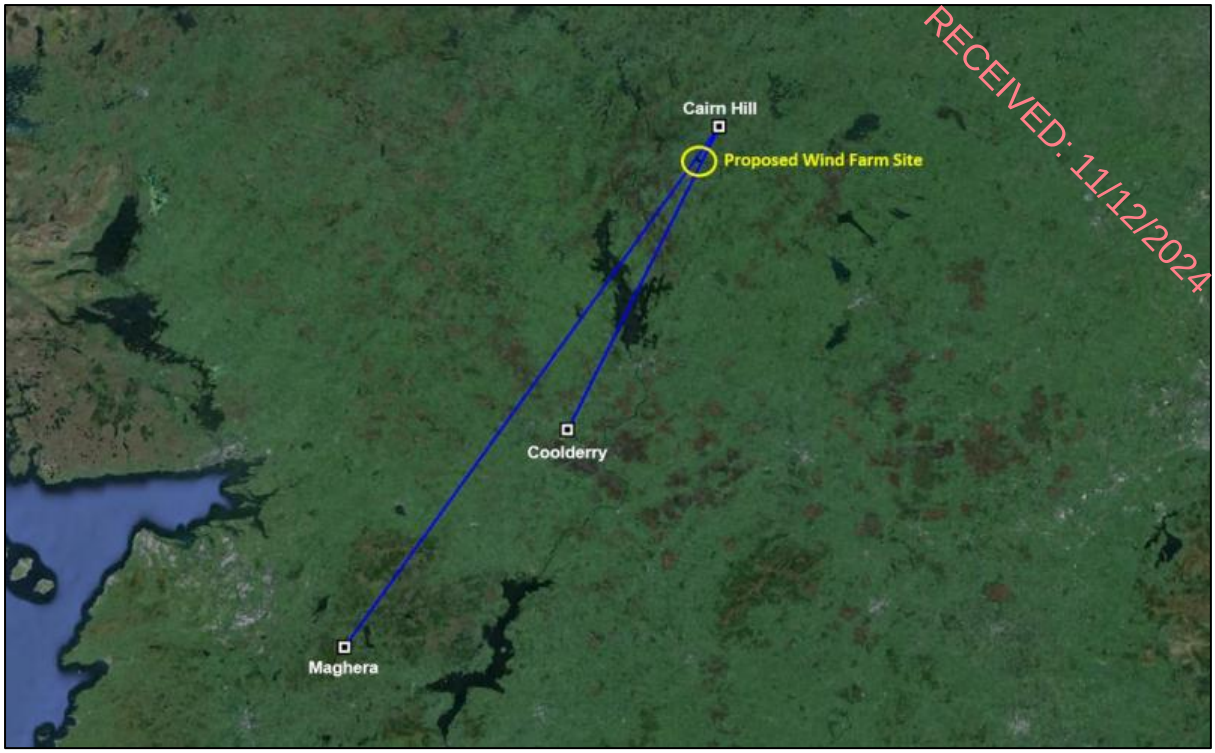

Figure 7-1 – 2RN Radio Network – Plan View

The Enet network in the vicinity of the proposed wind farm consists of three Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 7-3 below and a Plan View of the Enet network is shown in Figure 7-2.

Link No.	Operator	Link Description
1	Enet	PTP microwave radio link from Cairn Hill to Abbott Longford.
2	Enet	PTP microwave radio link from Cairn Hill to Bluebac Longford.
3	Enet	PTP microwave radio link from Cairn Hill to Longford Co Co.

Table 7-3 – Enet Radio Links

Figure 7-2 – Enet Radio Network shown relative to the proposed development - Telecommunications study area outlined in yellow.

The Imagine Broadband network in the vicinity of the proposed wind farm consists of one Point- to-Point (PTP) microwave radio link. The radio link is listed below in Table 7-4 and a Plan View of the network is shown in Figure 7-3.

Link ID	Operator	Link Description
1	Imagine Broadband	PTP microwave radio link from Cairn Hill to Longford Town Shopping Centre.

Table 7-4 – Imagine Broadband Radio Links

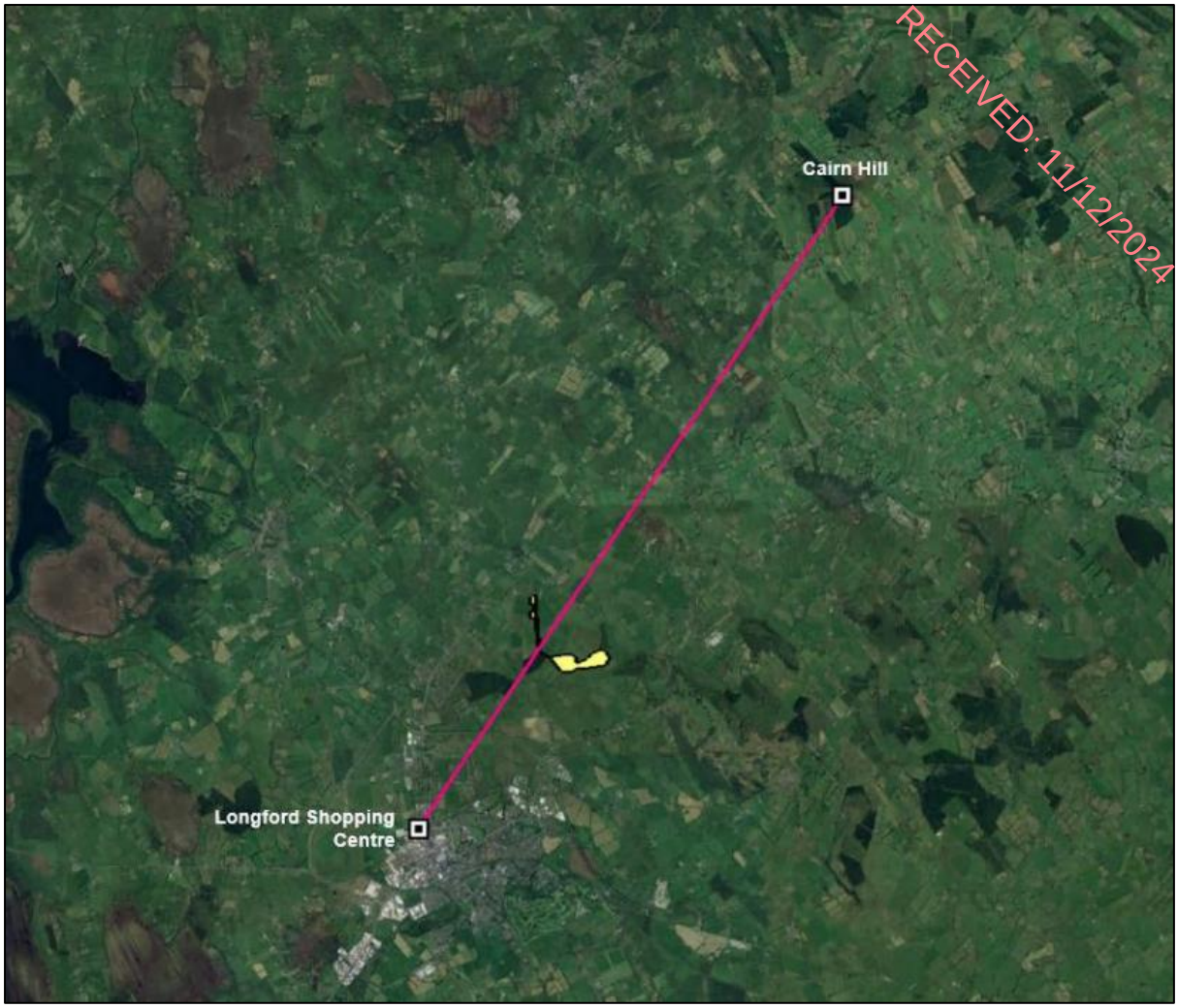

Figure 7-3 – Imagine Broadband Radio Network – Plan View - Telecommunications study area outlined in yellow.

The Three Ireland network in the vicinity of the proposed wind farm consists of one Point-to- Point (PTP) microwave radio link. The radio link is listed below in Table 7-5 and a Plan View ofthe Three Ireland network is shown in Figure 7-4.

Link ID	Operator	Link Description
1	Three Ireland	PTP microwave radio link from Templemichael Business Park to Cairn Hill.

Table 7-5 – Three Ireland Radio Links

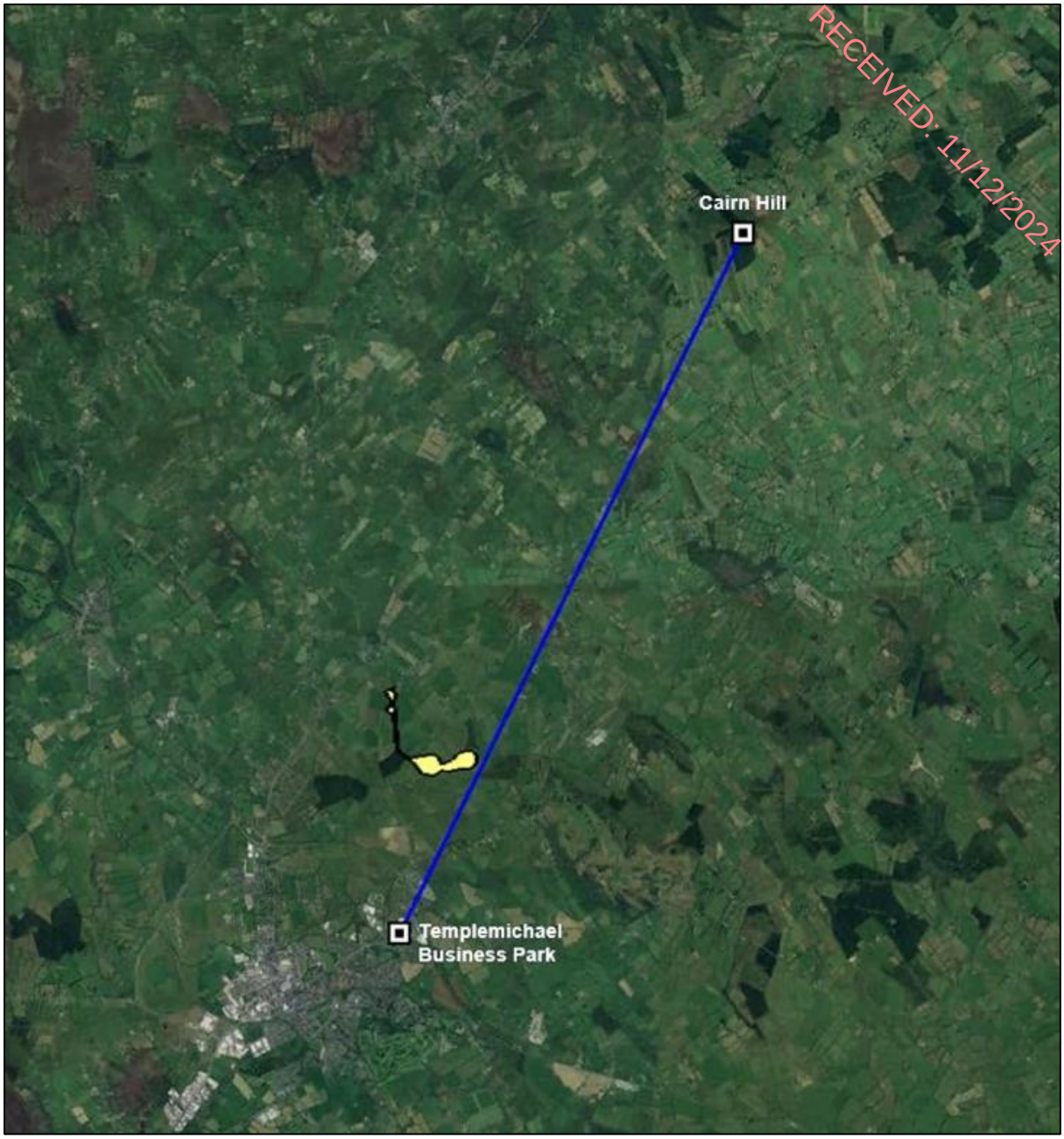

Figure 7-4 – Three Ireland Radio Network – Plan View - Telecommunications study area outlined in yellow.

The Vodafone network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed below in Table 7-6 and a Plan View of the Vodafone network is shown in Figure 7-5.

Link ID	Operator	Link Description
1	Vodafone	PTP microwave radio link from Corlea to Brian Fallon Hardware.
2	Vodafone	PTP microwave radio link from Cairn Hill to Longford Garda Station.

3	Vodafone	PTP microwave radio link from Cairn Hill to Longford ESB.
4	Vodafone	PTP microwave radio link from Cairn Hill to Cablecomm.

Table 7-6 - Vodafone Radio Links

Figure 7-5 – Vodafone Radio Network – Plan View - Telecommunications study area outlined in yellow.

The Eir network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed below in Table 7-7 and a Plan View of the Three Ireland network is shown in Figure 7-6.

Link ID	Operator	Link Description
1	Eir	PTP microwave radio link from Cairn Hill to Cablecomm.

Table 7-7 – Eir Radio Links

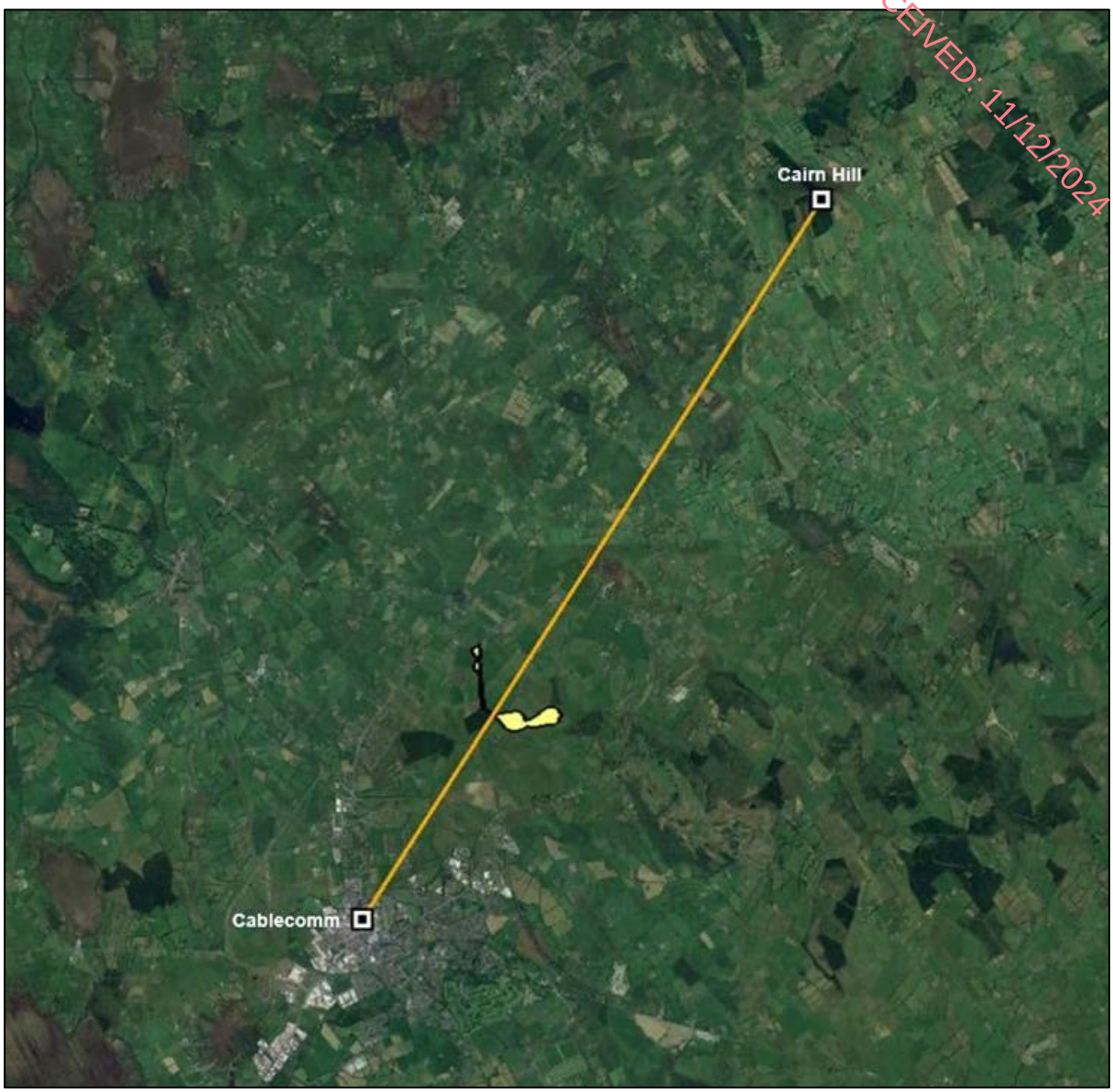

Figure 7-6 - Eir Radio Network – Plan View - Telecommunications study area outlined in yellow.

7.5.1.2 Underground/ Overground Telecommunication Services

Mapping of the existing telecoms infrastructure has been sourced from the eMaps Open Eir Civil Engineering Infrastructure Service which enables users to view and request maps of telecoms infrastructure. It was observed that there is existing underground, and overhead telecommunications cables present along the grid route options and along the turbine delivery route. There are no underground/ overground telecommunications services crossing the proposed development site.

7.5.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no potential for impact on telecommunication services.

7.5.3 Potential Significant Effects

7.5.3.1 Construction Phase

7.5.3.1.1 Development Site

Point to Point Radio Links

During the construction of the wind farm, potential effects on point-to-point radio links may include signal interference or disruption caused by the presence of large structures, such as turbines and cranes. In the absence of mitigation, the construction phase is expected to have a ***Likely***, ***Negative, Not Significant, and Brief*** effect on these links.

Underground/ Overground Telecommunication Services

Based on the review of the Eir Emaps, there are no underground/ overground telecommunication services on the proposed development site. The development will have ***Neutral Effect*** on underground/ overground telecommunication services during the construction phase.

7.5.3.1.2 Turbine Delivery Route

Point to Point Radio Links

The Turbine delivery route will have ***Neutral Effect*** on Point-to-Point Radio Links during the construction phase.

Underground/ Overground Telecommunication Services

The relocation/ alteration of telecommunications poles will be required to accommodate the delivery of turbine components during the construction stage. This is ***Likely*** to lead to a ***Negative, Not Significant,*** and ***Temporary*** effect on local telecommunications infrastructure.

7.5.3.1.3 Grid Route

Point to Point Radio Links

The grid route is underground. Thus, the grid route will cause ***Neutral Effect*** on point-to-point radio links during construction stage.

Underground/ Overground Telecommunication Services

There are underground telecommunications services along the 3 grid route options. It is likely that localised sections of services may require alteration/ relocation works. Therefor alteration/ relocation works are ***Likely*** to lead to ***Negative, Slight,*** *and* ***Temporary*** effects on telecommunications infrastructure.

7.5.3.2 Operational Phase

7.5.3.2.1 Development Site

Point to Point Radio Links

Based on the assessment carried out by AI Bridges, the proposed development will have ***Neutral Effect*** on point-to-point radio links as the turbines do not interact with the point-to-point link paths.

Underground/ Overground Telecommunication Services

The development will have a ***Neutral Effect*** on underground/ overground telecommunication services during the operational phase.

7.5.3.2.2 Turbine Delivery Route

Point to Point Radio Links

The Turbine delivery route will have a **Neutral Effect** on Point-to-Point Radio Links during the operational phase.

Underground/ Overground Telecommunication Services

The turbine delivery route will have ***Neutral Effects*** on underground/ overground electrical infrastructure during the operational phase, as no further disruptions are anticipated.

7.5.3.2.3 Grid Route

Point to Point Radio Links

The grid route is underground. Thus, the grid route will cause ***Neutral Effect*** on point-to-point radio links during operational stage.

Underground/Overground Telecommunication Services

The installed cable route will have **Neutral Effects** on underground telecommunications infrastructure during the operational phase, as no further disruptions are anticipated.

7.5.3.3 Decommissioning Phase

7.5.3.3.1 Development Site

Point to Point Radio Links

Similar to the construction stage, large cranes will be required to uninstall the turbines at the proposed development, those of which may cause signal interference or disruption. Thus, the decommissioning of the proposed development it is ***Likely*** to have a ***Negative, Not Significant,*** and ***Brief Effect*** on these links at decommissioning phase.

Underground/Overground Telecommunication Services

The development will have a ***Neutral Effect*** on underground/ overground telecommunication services during the decommissioning phase.

7.5.3.3.2 Turbine Delivery Route

Point to Point Radio Links

The Turbine delivery route will have a ***Neutral Effect*** on Point-to-Point Radio Links during the decommissioning phase.

Underground/Overground Telecommunication Services

The decommissioning stage requires the removal of turbine components from site. Similar to the construction stage the relocation/ alteration of telecommunications poles will be required to accommodate the delivery of turbine components during the decommissioning stage. This is ***Likely*** to lead to a ***Negative, Not Significant,*** and ***Temporary*** effect on local telecommunications infrastructure.

7.5.3.3.3 Grid Route

Point to Point Radio Links

The grid route is underground. Thus, the grid route will cause ***Neutral Effect*** on point-to-point radio links during construction stage.

Underground/Overground Telecommunication Services

It is proposed to leave underground cable ducts in situ, as this minimizes environmental disruption. The grid route is expected to result in a ***Neutral Effect*** during the decommissioning phase as no additional disturbances to existing telecommunications infrastructure will occur.

7.5.3.4 Cumulative Effects

The proposed development is not expected to result in cumulative effects on telecommunications infrastructure when considered in combination with other existing or proposed developments.

7.5.4 Mitigation Measures

To minimize potential significant effects on telecommunications, a number of mitigation measures will be implemented. These mitigation measures can be described as the following:

- Mitigation by design;
- Mitigation by appropriate construction methodology.

7.5.4.1 Mitigation by design

- **Wind Turbine Layout:** The turbine locations have been selected to avoid impacting on telecommunication infrastructure, however, prior to construction, the location of the wind turbines will be further reviewed to ensure they do not interfere with point-to-point transmission services.
- **Turbine Delivery Route:** As far as practicable the turbine delivery route has been designed to avoid existing overground Telecommunication infrastructure cables, reducing the potential for conflict.

- **Grid Route Design**: As far as practicable the underground Grid Connection route will be designed to avoid existing underground Telecommunication infrastructure cables, reducing the potential for conflict.

7.5.4.2 Mitigation by appropriate construction methodology

- **Telecommunications Provider Coordination**: The developer will liaise with utility providers to ensure all services are identified, and safe practices are employed during excavation near underground services;
- **Telecommunications Provider Guidelines**: Compliance with all relevant service provider guidelines, including safe working procedures near live telecommunications infrastructure, will be enforced;
- **Confirmatory Survey**: Prior to construction, a confirmatory survey of all existing services will be conducted to verify assumptions and identify the precise location of underground and overhead services;
- **Hand Digging**: Excavation around identified services will be carried out by hand where necessary to minimize the risk of accidental damage;
- **Real-time Monitoring of Signal Interference**: During the construction and decommissioning phases, real-time monitoring equipment will detect any signal interference, enabling immediate corrective action if required;
- **Backup Services for Relocated Poles**: Backup services, such as mobile units, will be arranged, if required, if telecommunications poles are temporarily relocated, minimizing disruption to the local network;
- **Post-construction Testing and Validation**: After construction, a full survey will confirm that no services have been disrupted. If disruptions are found, the developer will work with utility providers to restore functionality before operations begin.

7.5.5 Residual Impact Assessment

The mitigation measures significantly reduce the risk of potential effects on telecommunications infrastructure. However, they do not completely eliminate the possibility of impacts. The implementation of appropriate design and construction methodology will reduce the duration of effects. Brief durations can be reduced to Momentary and Temporary durations can be reduce to Brief. The significance of the effects will remain the same as outlined in Section 7.5.3.

7.6 Aviation

As part of the assessment of the potential effects of the proposed development on Aviation, AI Bridges were consulted to carry out an Aviation Review Statement. This is contained in **Error! Reference source not found.**.

7.6.1 Existing Receiving Environment

A desk-based review indicates that there are numerous aerodromes and airfields in the surrounding region. However, Ireland West Airport was noted as the closest airport to the proposed development. The details of the airport and the distance from the Airport reference Point (ARP) to the proposed wind farm site is outlined in Table 7-8 . Ireland West Airport operates in Class C controlled airspace with Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) Flight rules.

Location	Installation	Description	Airport Ref. Point ARP	ARP Distance to Proposed Wind Farm
Ireland West Airport, Charlestown, Co Mayo	International Airport	Single Asphalt Runway Airspace: Class C	53 54 37 N 08 49 06 W (Mid-point of Runway 08/26).	70.2 km

Table 7-8 – Ireland West Airport Details

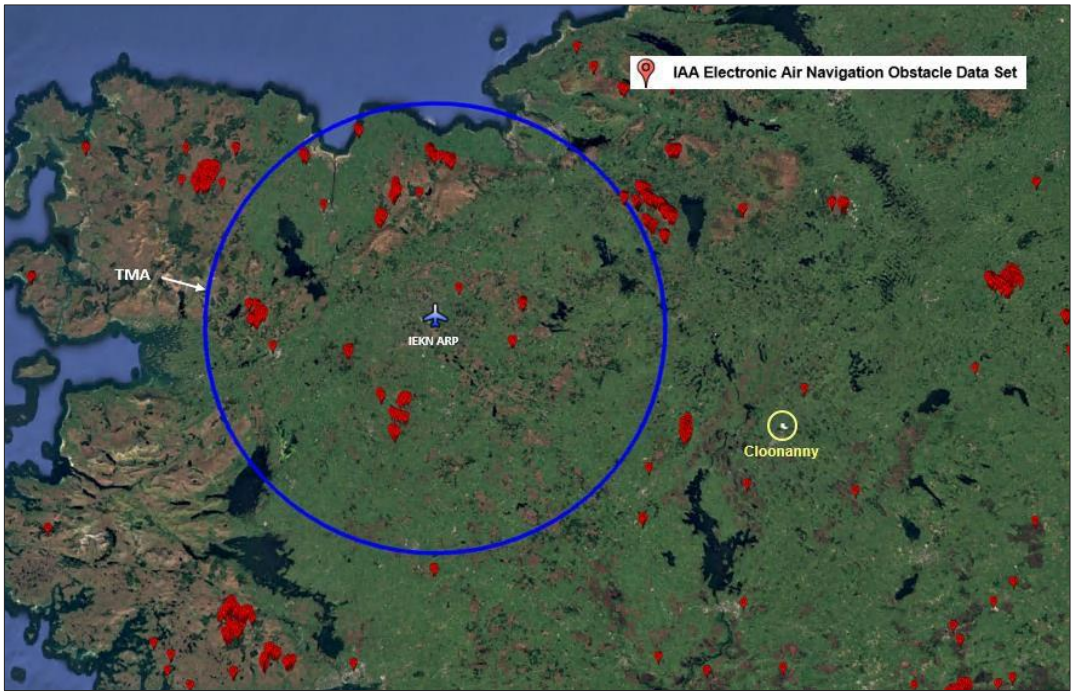

Figure 7-7 – Aerodrome Surfaces and IAA Electronic Air Navigation Obstacle Data in proximity to the development site

It should also be noted that there are other existing tall structures (obstacles) nearer to the airport, e.g. the operational wind farms at Sliabh Bawn, Largan Hill, Roosky, Ballykinava, Cloontoa, Magheramore, Cuillilea, and Lenanavea.

These existing obstacles would shield any potential impacts from the proposed wind farm at Cloonanny. The IAA Electronic Air Navigation Obstacle Data Set permitted obstacles are shown relative to the proposed wind farm in Figure 7-7 – Aerodrome Surfaces and IAA Electronic Air Navigation Obstacle Data in proximity to the development site.

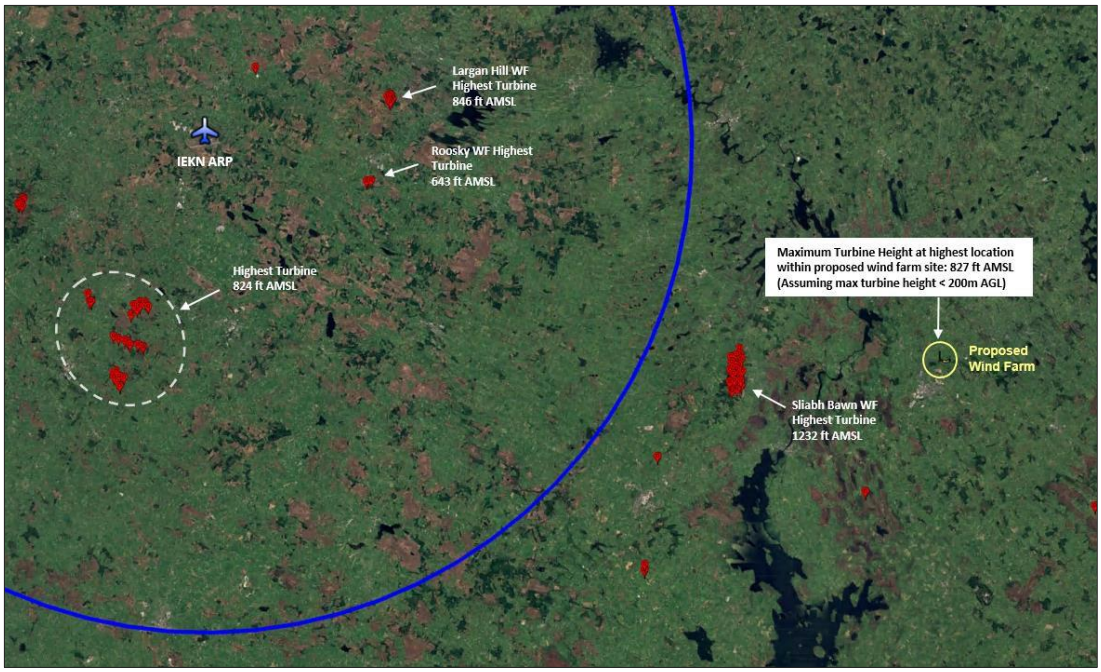

Figure 7-8 – Permitted Obstacles in vicinity of Cloonanny Wind Farm

7.6.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no potential for impact on aviation services.

7.6.3 Potential Significant Effects

Airports are valuable transport, tourism, employment, and business assets for the local and national economy. The development of large energy projects has the potential to impact air service and operations (airports, landing strips, etc.) within a project area. Developments around airports and under flightpaths can constrain operations, either directly where they conflict with safety/operational requirements, or indirectly where they interfere with radar or other navigational aids.

7.6.3.1 Construction Phase

Development site, Turbine delivery route and grid route.

Based on the aviation review statement by Ai Bridges, it is likely that there will be ***Neutral Effect*** on aviation services during the construction phase.

7.6.3.2 Operational Phase

Development site, Turbine delivery route and grid route.

During the operational phase, the aviation review indicates that there is likely to be a ***Neutral Effect*** on aviation services.

7.6.3.3 Decommissioning Phase

Development site, Turbine delivery route and grid route.

Similarly, the aviation review suggests that there will be a ***Neutral Effect*** on aviation services during the decommissioning phase.

7.6.3.4 Cumulative Effects

The proposed development is not expected to result in any cumulative effects with other existing permitted or proposed developments.

7.6.4 Mitigation Measures

Although no potential impacts were identified, the following mitigation measures required by the Irish Aviation Authority (IAA) will be implemented. These mitigation measures can be described as the following:

- Mitigation by design;
- Mitigation by appropriate construction methodology.

7.6.4.1 Mitigation by design

- An aeronautical lighting scheme for the Development will be agreed with the IAA and will be installed on the turbines;

7.6.4.2 Mitigation by appropriate construction methodology

- As-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location will be provided to the IAA;
- The IAA will be notified of intention to commence crane operations with at least 30 days prior notification of their erection.

7.6.5 Residual Impact Assessment

Development site, Turbine delivery route and grid route.

Based on the aviation review statement conducted by Ai Bridges, there will be a ***Neutral Effect*** on aviation services throughout the various phases of the project, with the proposed mitigation measures further ensuring adherence to safety standards.

7.7 Gas

7.7.1 Existing Receiving Environment

Following a review of the Gas Network Ireland Dial Before You Dig (DBYD) maps, it was observed that there are no gas pipelines present within the study area. This indicates that the proposed development will not interfere with any existing gas infrastructure, thus minimizing potential risks associated with gas supply disruptions.

Given the absence of gas infrastructure in the vicinity, no further assessment is required regarding gas infrastructure for the proposed development.

7.7.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no potential for impact on gas infrastructure.

7.7.3 Potential Significant Effects

7.7.3.1 Construction Phase

Development site, Turbine delivery route and grid route.

Given the absence of gas infrastructure in the area, the construction phase of the development will have a **Neutral Effect** on gas services.

7.7.3.2 Operational Phase

Development site, Turbine delivery route and grid route.

Given the absence of gas infrastructure in the area, the operational phase of the development will have a **Neutral Effect** on gas services.

7.7.3.3 Decommissioning Phase

Development site, Turbine delivery route and grid route.

Given the absence of gas infrastructure in the area, the decommissioning phase of the development will have a **Neutral Effect** on gas services.

7.7.3.4 Cumulative Effects

Development site, Turbine delivery route and grid route.

There is no gas infrastructure within the development area, and no known other developments nearby include gas infrastructure, the proposed development is **not** assessed as likely to result in cumulative effects related to gas services with other existing or proposed projects.

7.7.4 Mitigation Measures

While no specific mitigation measures are required for gas infrastructure due to the absence of gas networks in the vicinity, the following general procedures will be implemented to ensure minimal risk and maximum safety:

1. **Review and confirmation of absence of gas infrastructure**: Prior to construction, the Gas Networks Ireland DBYD maps will be revisited to verify that no new gas pipelines or services have been installed since the initial assessment.
2. **Liaison with Gas Networks Ireland (GNI)**: Although no gas infrastructure is currently identified, GNI will be consulted to ensure that no unforeseen services are present or planned, ensuring full compliance with any additional safety or procedural requirements.
3. **Compliance with safety guidelines**: As a precaution, all construction activities will follow standard industry safety protocols for working in areas where there could be undetected services or utilities, similar to the approach taken for electrical and telecommunications infrastructure.

7.7.5 Residual Impact Assessment

Given that no gas infrastructure exists within the EIAR study area and the implementation of precautionary measures, the residual impact of the proposed development on gas services is anticipated to be ***Neutral*** expected during any phase of the proposed development.

7.8 Water and Wastewater Infrastructure

7.8.1 Existing Receiving Environment

Following a review of the Uisce Éireann Web Maps and Local Authority infrastructure records, it was observed that there is water and wastewater infrastructure present along the grid route options, the turbine delivery route and in the vicinity of the site. There is no Water and Wastewater infrastructure on the proposed development site.

7.8.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no potential for impact on water and wastewater infrastructure.

7.8.3 Potential Significant Effects

7.8.3.1 Construction Phase

7.8.3.1.1 Development Site

Water

It is not proposed that water utility infrastructure will be required at the proposed development site. Water needs for construction activities will be minimal and limited to uses such as concrete truck chute washing, dust suppression, and sanitary facilities. It is proposed that this water requirement will be sourced from on-site rainwater collection systems and settlement ponds. Potable water demand will be minimal and met by imported bottled water. Therefore, it is expected that the proposed development will have ***Neutral Effects*** on the water infrastructure.

Wastewater

During construction, sanitary wastewater—estimated at 1,500 to 3,750 litres per week (Based on 150l per person working on site per week)—will be collected in holding tanks within the temporary toilet units. Welfare facilities will be rented from a reputable supplier licensed to dispose of wastewater at approved treatment plants. The effluent is expected to be transported to and treated at Longford or Ennybegs Wastewater Treatment Plant (WWTP) as these are the closest WWTP'S to the site with capacity. No wastewater infrastructure will be utilised on site during construction phase. Therefore, it is expected that the proposed development will have ***Neutral Effect*** on the wastewater infrastructure.

7.8.3.1.2 Turbine Delivery Route

Water

The impact of the proposed development including activities associated with delivery of the turbine components during the construction stage will have a ***Neutral Effect*** on water infrastructure along the turbine delivery route.

Wastewater

The impact of the proposed development including activities associated with delivery of the turbine components during the construction stage will have a ***Neutral Effect*** on wastewater infrastructure along the turbine delivery route.

7.8.3.1.3 Grid Route

Water

There is underground water and wastewater infrastructure along the 3 grid route options. It is ***Likely*** that localised sections of services may require alteration/ relocation works. This could lead to temporary water outages affecting local area. Alteration/ relocation works are ***Likely*** to lead to ***Negative, Slight,*** and ***Temporary Effects*** on water infrastructure.

There is a risk that machinery might inadvertently strike unknown underground services, leading to damage to existing water infrastructure and subsequent outages. This would result in ***Negative, Slight, and Temporary Effects*** on local infrastructure.

Wastewater

There is underground water infrastructure along the 3 grid route options. It is ***Likely*** that localised sections of services may require alteration/ relocation works. This could lead to temporary wastewater outages affecting local area. Alteration/ relocation works are ***Likely*** to lead to ***Negative, Slight,*** and ***Temporary Effects*** on wastewater infrastructure.

There is a risk that machinery might inadvertently strike unknown underground services, leading to damage to existing wastewater infrastructure and subsequent outages. This would result in ***Negative, Slight, and Temporary Effects*** on local infrastructure.

7.8.3.2 Operational Stage

7.8.3.2.1 Development Site

Water

The Wind Farm development will be unmanned during Operation stage but will require planned maintenance and may require maintenance on an ad hoc basis. It is predicted that maintenance will be undertaken 12 times per year planned, and twice per year unplanned, during these periods, personnel will require potable drinking water. However, similar to the construction stage, it is envisaged that the potable water demand will be minimal and will be satisfied by imported bottled water supply.

The proposed development does not require water connection. The proposed development will have a ***Neutral Effect*** to existing water infrastructure during the operational phase.

Wastewater

As outlined in the Wind Energy Ireland 'Health & Safety Series – Wind Farm Welfare Facilities' Sites with 1-2 turbines, which typically have maintenance activity less than once per month, can satisfy the requirement of toilets and hand washing facilities requirement by providing temporary facilities

during periods of high maintenance activity. Arrangements for providing temporary facilities will be agreed in advance, so that they can be implemented as soon as a potential extended fault occurs.

During long maintenance periods at operational Welfare facilities will be rented from a reputable supplier licensed to dispose of wastewater at approved treatment plants. The effluent is expected to be transported to and treated at Longford or Ennybegs Wastewater Treatment Plant (WWTP) as these are the closest WWTP'S to the site with capacity. No wastewater infrastructure will be utilised on site during construction phase. Therefore, it is expected that the proposed development will have ***Neutral Effect*** on the wastewater infrastructure.

The proposed development does not require wastewater connection. The proposed development will have ***Likely, Neutral, Imperceptible, Long-Term Effects*** to existing wastewater infrastructure during the operational phase.

7.8.3.2.2 Turbine Delivery Route

Water

The impact of the proposed development including activities associated with delivery of the turbine components during the operational stage will have a ***Neutral Effect*** on water infrastructure along the turbine delivery route.

Wastewater

The impact of the proposed development including activities associated with delivery of the turbine components during the operational stage will have a ***Neutral Effect*** on wastewater infrastructure along the turbine delivery route.

7.8.3.2.3 Grid Route

Water

The installed cable route will have **Neutral Effects** on water infrastructure during the operational phase.

Wastewater

The installed cable route will have **Neutral Effects** on wastewater infrastructure during the operational phase.

7.8.3.3 Decommissioning Phase

7.8.3.3.1 Development Site

Water

It is not proposed that water utility infrastructure will be required at the proposed development site. Water needs for decommissioning activities will be minimal and limited to uses such as concrete truck chute washing, dust suppression, and sanitary facilities. It is proposed that this water requirement will be sourced from on-site rainwater collection systems and settlement ponds. Potable water demand will be minimal and met by imported bottled water. Therefore, it is expected that the development site will have ***Neutral Effects*** on the water infrastructure at decommissioning phase.

Wastewater

During decommissioning, sanitary wastewater—estimated at 1,500 to 3,750 liters per week (Based on 150l per person working on site per week)—will be collected in holding tanks within the temporary toilet units. Welfare facilities will be rented from a reputable supplier licensed to dispose of wastewater at approved treatment plants. As the project has a proposed lifespan of 35 years, disposal agreements will be put in place at the appropriate time with Uisce Éireann. At the time of decommissioning, Uisce Éireann will be consulted to determine the capacity at each of the WWTP's in the vicinity of the site and which WWTP is to be used. No wastewater infrastructure will be utilised on site during construction phase. Therefore, it is expected that the proposed development will have ***Neutral Effect*** on the wastewater infrastructure.

7.8.3.3.2 Turbine Delivery Route

Water

The turbine delivery route will cause ***Neutral Effect*** on water infrastructure during the decommissioning stage.

Wastewater

The turbine delivery route will cause ***Neutral Effect*** on wastewater infrastructure during the decommissioning stage.

7.8.3.3.3 Grid Route

Water

It is proposed to leave underground cable ducts in situ, as this minimizes environmental disruption. As no works are proposed along the grid route, this is expected to result in ***Neutral, Long-Term Effects*** during the decommissioning phase as no additional disturbances to existing wastewater infrastructure will occur.

Wastewater

It is proposed to leave underground cable ducts in situ, as this minimizes environmental disruption. As no works are proposed along the grid route, this is expected to result in ***Neutral, Long-Term Effects*** during the decommissioning phase as no additional disturbances to existing Wastewater infrastructure will occur.

7.8.3.4 Cumulative Effects

Given the scale and nature of the proposed development it is not likely to result in any cumulative effects on water and wastewater infrastructure, when considered with other existing, permitted or proposed developments.

7.8.4 Mitigation Measures

The following mitigation measures will be implemented to minimize the potential effects of the proposed development on existing water and wastewater infrastructure:

7.8.4.1 Mitigation by design

- **Grid Route Design**: As far as practicable the underground Grid Connection route will be designed to avoid existing underground water and wastewater infrastructure, reducing the potential for conflict.

7.8.4.2 Mitigation by appropriate construction methodology

- **Utility Provider Coordination**: The developer will liaise with utility providers to ensure all services are identified, and safe practices are employed during excavation near underground services;
- **Utility Provider Guidelines**: Compliance with all relevant service provider guidelines, including safe working procedures near water and wastewater infrastructure, will be enforced;
- **Confirmatory Survey**: Prior to construction, a confirmatory survey of all existing services will be conducted to verify assumptions and identify the precise location of underground;
- **Hand Digging**: Excavation around identified services will be carried out by hand where necessary to minimize the risk of accidental damage;
- **Post-construction Testing and Validation**: After construction, a full survey will confirm that no services have been disrupted. If disruptions are found, the developer will work with utility providers to restore functionality before operations begin.
- **Compliance with guidelines**: All works will be in compliance with the relevant service provider's requirements or guidelines, including safety practices for working near underground services;
- **Availability of materials**: Additional materials will be kept on-site to make any necessary temporary repairs in case of accidental damage to water or wastewater services**.** On-site contingency plans will ensure that in the event of accidental service damage, immediate temporary repairs can be made until permanent solutions are implemented by the service provider.

7.8.5 esidual Impact Assessment

The mitigation measures significantly reduce the risk of potential effects on water and wastewater infrastructure. However, they do not completely eliminate the possibility of impacts. The implementation of appropriate design and construction methodology will reduce the duration of effects from Temporary to Brief. The significance of the effects will remain the same as outlined in Section 7.8.3.

7.9 Waste Management

7.9.1 Existing Receiving Environment

There is currently no waste infrastructure within the study area.

7.9.2 'Do Nothing' Scenario

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no waste generated, thus there will be no effect on waste management.

7.9.3 Potential Significant Effects

7.9.3.1 Construction Phase

During the construction phase, solid waste will be generated. These are outlined in Table 7-9.

EWC	Description of Material
170504	Soil & Spoil
170201	Timber
170405	Metals (Iron and Steel)
170101	Concrete
200301	Municipal waste
	Sundry Material Waste
200102	Glass
200139	Packaging / Plastics
200135	Waste electrical and electronic
	Other

Table 7-9 – Expected Construction Stage Waste Streams

The potential significant effects at construction stage are outlined below:

- **Improper Segregation of Waste:** Failure to segregate waste streams on-site could result in recyclable materials being sent to landfill, leading to a ***Negative, Moderate, Long-Term Effect*** on resource efficiency and landfill capacity.
- **Exceeding Waste Storage Capacity:** Inadequate planning for waste storage could lead to overfilled waste containers, increasing the risk of spillage and litter, causing *a* ***Negative, Slight, Short-Term Effect*** on site cleanliness and the surrounding area.
- **Illegal Waste Disposal:** Engaging unlicensed waste contractors or improper documentation of waste disposal could result in fly-tipping or non-compliance with regulations, leading to a ***Negative, Significant, Long-Term Effect*** on environmental quality and legal compliance.
- **Hazardous Waste Mismanagement:** Mishandling or improper storage of hazardous materials such as oils could lead to soil and water contamination, causing a ***Negative, Moderate, Long-Term Effect*** on the environment.

- **Leachate from Waste Storage:** If waste is not stored in appropriate containers, rainfall could create leachate that contaminates surrounding soil or watercourses, resulting in a ***Negative, Moderate, Long-Term Effect*** on local ecosystems.
- **Odour Issues from Waste Accumulation:** Prolonged storage of organic or putrescible waste without timely removal could generate unpleasant odours, leading to a ***Negative, Slight, Short-Term Effect*** on local amenity and community well-being.
- **Pest Infestation from Waste Storage:** Poorly managed waste, particularly food waste, could attract vermin or pests, resulting in a ***Negative, Moderate, Long-Term Effect*** on site hygiene and neighbouring areas.

7.9.3.2 Operational Phase

During the operational phase, minimal amounts of solid waste will be generated. These are outlined in Table 7-10

EWC	Description of Material
200301	Municipal waste
	Sundry Material Waste
200102	Glass
200139	Packaging / Plastics
200135	Waste electrical and electronic
13 02 08	Waste Oils

Table 7-10 – Expected Operational Stage Waste Streams

The potential significant effects at operational stage are outlined below:

- **Improper Segregation of Waste:** Failure to segregate waste streams on-site could result in recyclable materials being sent to landfill, leading to a ***Negative, Moderate, Long-Term Effect*** on resource efficiency and landfill capacity.
- **Exceeding Waste Storage Capacity:** Inadequate planning for waste storage could lead to overfilled waste containers, increasing the risk of spillage and litter, causing *a* ***Negative, Slight, Short-Term Effect*** on site cleanliness and the surrounding area.
- **Illegal Waste Disposal:** Engaging unlicensed waste contractors or improper documentation of waste disposal could result in fly-tipping or non-compliance with regulations, leading to a ***Negative, Significant, Long-Term Effect*** on environmental quality and legal compliance.
- **Hazardous Waste Mismanagement:** Mishandling or improper storage of hazardous materials such as oils could lead to soil and water contamination, causing a ***Negative, Moderate, Long-Term Effect*** on the environment.
- **Leachate from Waste Storage:** If waste is not stored in appropriate containers, rainfall could create leachate that contaminates surrounding soil or watercourses, resulting in a ***Negative, Moderate, Long-Term Effect*** on local ecosystems.
- **Odour Issues from Waste Accumulation:** Prolonged storage of organic or putrescible waste without timely removal could generate unpleasant odours, leading to a ***Negative, Slight, Short-Term Effect*** on local amenity and community well-being.

- **Pest Infestation from Waste Storage:** Poorly managed waste, particularly food waste, could attract vermin or pests, resulting in a ***Negative, Moderate, Long-Term Effect*** on site hygiene and neighbouring areas.

7.9.3.3 Decommissioning Phase

During the decommissioning phase, significant amounts of solid waste will be generated. These are outlined in Table 7-11.

EWC	Description of Material
101103	Fibreglass
170504	Soil & Spoil
170201	Timber
170405	Metals (Iron and Steel)
170101	Concrete
200301	Municipal waste
	Mixed recyclable waste
200102	Glass
200139	Packaging / Plastics
200135	Waste electrical and electronic
	Other

Table 7-11 – Expected Decommissioning Stage Waste Streams

The potential significant effects at decommissioning stage are outlined below:

- **Non-recyclable Materials:** The fibreglass turbine blades are difficult to recycle and currently are generally disposed of by landfill. This would induce a ***Moderate, Negative Effect*** from the development.
- **Improper Segregation of Waste:** Failure to segregate waste streams on-site could result in recyclable materials being sent to landfill, leading to a ***Negative, Moderate, Long-Term Effect*** on resource efficiency and landfill capacity.
- **Exceeding Waste Storage Capacity:** Inadequate planning for waste storage could lead to overfilled waste containers, increasing the risk of spillage and litter, causing a ***Negative, Slight, Short-Term Effect*** on site cleanliness and the surrounding area.
- **Illegal Waste Disposal:** Engaging unlicensed waste contractors or improper documentation of waste disposal could result in fly-tipping or non-compliance with regulations, leading to a ***Negative, Significant, Long-Term Effect*** on environmental quality and legal compliance.
- **Hazardous Waste Mismanagement:** Mishandling or improper storage of hazardous materials such as oils could lead to soil and water contamination, causing a ***Negative, Moderate, Long-Term Effect*** on the environment.
- **Leachate from Waste Storage:** If waste is not stored in appropriate containers, rainfall could create leachate that contaminates surrounding soil or watercourses, resulting in a ***Negative, Moderate, Long-Term Effect*** on local ecosystems.

- **Odour Issues from Waste Accumulation:** Prolonged storage of organic or putrescible waste without timely removal could generate unpleasant odours, leading to a ***Negative, Slight, Short-Term Effect*** on local amenity and community well-being.
- **Pest Infestation from Waste Storage:** Poorly managed waste, particularly food waste, could attract vermin or pests, resulting in a ***Negative, Moderate, Long-Term Effect*** on site hygiene and neighbouring areas.

7.9.3.4 Cumulative Effects

Given the scale and nature of the proposed development it is not likely to result in any cumulative effects on waste infrastructure, when considered with other existing, permitted or proposed developments.

7.9.4 Mitigation Measures

Mitigation measures outlined below will be applied during the construction, operational, and decommissioning phase to prevent any adverse impacts from the proposed development.

7.9.4.1 Responsibilities

A competent person will be appointed for the management and responsibilities at each stage of the development outlined in the below sections. These persons will typically consist of the following:

- Construction Stage: Construction Manager
- Operational Stage: Operational and Maintenance Company – Typically the Turbine manufacturer.
- Decommissioning Stage: Construction Manager

7.9.4.2 Waste Prevention

During the detailed design, the appointed contractor will have responsibility for the development and management of waste handling procedures in accordance with waste legislation and the waste management hierarchy.

Measures implemented to achieve these aims will include, but are not limited to, the following:

- **Efficient Ordering**: Materials will be ordered in precise quantities using a "just in time" approach.
- **Handling Protocols**: Special handling measures will be in place to prevent damage to materials.
- **Supply Coordination**: Coordinated delivery schedules will minimize excess and redundant deliveries.

7.9.4.3 Waste Management Documentation and Compliance:

The construction project will adhere to comprehensive documentation and compliance requirements to ensure all waste management activities are traceable and compliant with regulations:

- **Compliance:** Where waste is created, it will be managed in accordance with the waste hierarchy in Council Directive 2008/98/EC on waste and section 21A of the Waste

Management Act 1996, as amended, as follows: (a)Prevention; (b)re-use; (c)Recycling; (d)Other recovery (including energy recovery); and (e) Disposal.

- **Permit and License Verification**: The contractor will keep a detailed file of Waste Collection Permits, Waste Facility Permits, Certificates of Registration, and Waste Licenses for all materials leaving the site.
- **On-Site Record-Keeping**: Receipts from waste disposal facilities will be maintained to verify that waste has been transferred to licensed facilities.

7.9.4.4 Waste Storage and Containment:

Temporary storage and containment of waste on-site will follow strict safety and environmental guidelines:

- **Designated Storage Areas**: Clearly marked and appropriately contained areas will be set up for temporary waste storage to prevent contamination and ensure safety.
- **Containment Procedures**: All waste containers will be sealed and regularly inspected to prevent spills, leaks, or exposure to weather elements.
- **Inventory and Inspection**: Regular inspections will be carried out to ensure that stored waste complies with site management policies and does not pose environmental or safety risks.

7.9.4.5 Management of the Movement of Waste

All movement of waste and the use of waste contractors will be undertaken in accordance with waste legislation including the following:

- Waste Management Acts 1996 (as amended);
- Waste Management (Collection Permit) Regulations 2007 as amended; and
- Waste Management (Facility Permit and Registration) Regulations 2007 as amended.

7.9.4.6 Turbine Re-use:

At the end of their operational lifespan, turbines will be inspected and evaluated for functionality and safety standards. Where deemed suitable, turbines will be refurbished or maintained as necessary to meet second-hand market requirements.

7.9.5 Residual Impact Assessment

With the implementation of mitigation measures the effects are reduced as follows:

Construction Phase:

All effect on the surrounding local environment reduces to a ***Neutral Effect.***

Operational Phase:

The effect on the surrounding local environment reduces to a ***Neutral Effect.***

Decommissioning Phase:

The mitigation measures significantly reduce the risk of potential effects on waste management. However, they do not completely eliminate the possibility of some impacts. The implementation of appropriate mitigation measures will reduce the significance of all effects to ***Neutral***.

7.10 Risk of Major Accidents or Disasters

No significant adverse effects of the proposed development on the environment deriving from the vulnerability of the proposed development to risks of major accidents and/or disasters are expected.

7.11 Interactions

Population and Human Health and Material Assets

Overall, the interaction of population and human health with Material Assets is considered a positive effect, resulting from the project's contribution to the electricity supply with the provision of a clean energy source.

7.12 Summary

This chapter has assessed the potential impacts of the proposed development on Material Assets – Built Services and Waste Management. The assessment indicates that no significant effects on the existing Built Services infrastructure within the study area are expected to arise from the proposed development during either the construction, operational or decommissioning phases.

Furthermore, the assessment confirms that there will be no significant cumulative effects resulting from the proposed development when evaluated in conjunction with all existing, approved, or proposed projects.

Provided all mitigation and monitoring measures set out in this chapter are adhered to in full throughout all phases, the overall predicted impact of the proposed development on built services and waste management is ***Not significant***.

Table 7-12 below provides a summary of the Potential Effects and Residual Impacts.

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
Construction Phase					
7.4	Electrical Infrastructure & Supply	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Likely, Negative, Slight, Temporary Effect	Yes, refer to Section 7.4.4 for details	Likely, Negative, Not Significant, Brief Effect
		Grid Route Options	Likely, Negative, Slight, Temporary Effect	Yes, refer to Section 7.4.4 for details	Likely, Negative, Slight, Brief Effects
7.5	Telecommunications	Development Site	Point to Point Radio Links; Negative, Not Significant, Brief Effect Underground/ Overground Telecom Services; Neutral Effect	Yes, refer to Section 7.5.4 for details	Point to Point Radio Links; Negative, Not Significant, Momentary Effect Underground/ Overground Telecom Services; Neutral Effect
		Turbine Delivery Route	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Not Significant, Temporary Effect	Yes, refer to Section 7.5.4 for details	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Not Significant, Brief Effect
		Grid Route Options	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Slight, Temporary Effect	Yes, refer to Section 7.5.4 for details	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Slight, Brief Effect
7.6	Aviation	Development Site	Neutral Effect	Yes, refer to Section 7.6.4 for details	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.7	Gas	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.8	Water and Wastewater Infrastructure	Development Site	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
		Turbine Delivery Route	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect
		Grid Route Options	Water: Likely, Negative, Slight, Temporary Effects Wastewater: Likely, Negative, Slight, Temporary Effects	Yes, refer to Section 7.8.4 for details	Water: Likely, Negative, Slight, Temporary Effects Wastewater: Likely, Negative, Slight, Temporary Effects
7.9	Waste Management	Surrounding Environment	Improper Segregation of Waste: Negative, Moderate, Long-Term Effect Exceeding Waste Storage Capacity: Negative, Slight, Short-Term Effect Illegal Waste Disposal: Negative, Significant, Long-Term Effect Hazardous Waste Mismanagement: Negative, Moderate, Long-Term Leachate from Waste Storage: Negative, Moderate, Long-Term Effect Odour Issues from Waste Accumulation: Negative, Slight, Short-Term Effect Pest Infestation from Waste Storage: Negative, Moderate, Long-Term	Yes, refer to Section 7.9.4 for details	Neutral Effect
Operational Phase					
7.4	Electrical Infrastructure & Supply	Development Site	Likely, Positive, Slight, Long-Term Effect	Yes, refer to Section 7.4.4 for details	Likely, Positive, Slight, Long-Term Effect
		Turbine Delivery Route	Neutral Effect	Yes, refer to Section 7.4.4 for details	Likely, Negative, Not Significant, Brief Effect

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.5	Telecommunications	Development Site	Point to Point Radio Links; Neutral EffectP UG/OG Telecom Services; Neutral Effect	Not required	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect
		Turbine Delivery Route	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect	Not required	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Not Significant, Brief Effect
		Grid Route Options	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect	Not required	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect
7.6	Aviation	Development Site	Neutral Effect	Yes, refer to Section 7.6.4 for details	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.7	Gas	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.8	Water and Wastewater Infrastructure	Development Site	Water: Neutral Effect, Imperceptible, Long-Term Effects Wastewater: Neutral Effect, Imperceptible, Long-Term Effects	Not required	Water: Neutral Effect, Imperceptible, Long-Term Effects Wastewater: Neutral Effect, Imperceptible, Long-Term Effects
		Turbine Delivery Route	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
		Grid Route Options	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect
7.9	Waste Management	Surrounding Environment	Improper Segregation of Waste: Negative, Moderate, Long-Term Effect Exceeding Waste Storage Capacity: Negative, Slight, Short-Term Effect Illegal Waste Disposal: Negative, Significant, Long-Term Effect Hazardous Waste Mismanagement: Negative, Moderate, Long-Term Leachate from Waste Storage: Negative, Moderate, Long-Term Effect Odour Issues from Waste Accumulation: Negative, Slight, Short-Term Effect Pest Infestation from Waste Storage: Negative, Moderate, Long-Term	Yes, refer to Section 7.9.4 for details	Neutral Effect
Decommissioning Phase					
7.4	Electrical Infrastructure & Supply	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Likely, Negative, Slight, Temporary Effect	Yes, refer to Section 7.4.4 for details	Likely, Negative, Not Significant, Brief Effect
		Grid Route Options	Neutral, Long-Term Effects	Not required	Neutral, Long-Term Effects
7.5	Telecommunications	Development Site	Point to Point Radio Links; Likely, Negative, Not Significant, Brief Effect	Not required	Point to Point Radio Links; Likely, Negative, Not Significant, Momentary

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
			UG/OG Telecom Services; Neutral Effect		Effect UG/OG Telecom Services; Neutral Effect
		Turbine Delivery Route	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Slight, Temporary Effect	Not required	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Likely, Negative, Not Significant, Brief Effect
		Grid Route Options	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect	Not required	Point to Point Radio Links; Neutral Effect UG/OG Telecom Services; Neutral Effect
7.6	Aviation	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.7	Gas	Development Site	Neutral Effect	Not required	Neutral Effect
		Turbine Delivery Route	Neutral Effect	Not required	Neutral Effect
		Grid Route Options	Neutral Effect	Not required	Neutral Effect
7.8	Water and Wastewater Infrastructure	Development Site	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect
		Turbine Delivery Route	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect
		Grid Route Options	Water: Neutral Effect Wastewater: Neutral Effect	Not required	Water: Neutral Effect Wastewater: Neutral Effect

Section	Material Asset: Built Service	Location	Potential Effect (Pre-Mitigation)	Mitigation Measures	Residual Impact (Post-Mitigation)
7.9	Waste Management	Surrounding Environment	Non-Recyclable Materials: Moderate, Negative Effect Improper Segregation of Waste: Negative, Moderate, Long-Term Effect Exceeding Waste Storage Capacity: Negative, Slight, Short-Term Effect Illegal Waste Disposal: Negative, Significant, Long-Term Effect Hazardous Waste Mismanagement: Negative, Moderate, Long-Term Leachate from Waste Storage: Negative, Moderate, Long-Term Effect Odour Issues from Waste Accumulation: Negative, Slight, Short-Term Effect Pest Infestation from Waste Storage: Negative, Moderate, Long-Term	Yes, refer to Section 7.9.4 for details	Neutral Effect

Table 7-12 Summary of the Potential Effects and Residual Impacts

7.13 References and Sources

Legislation and Directives:

- Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU.
- The European Union Waste Framework Directive (2008/98/EC); The European Commission's 'Circular Economy Action Plan' (EC, 2020);
- The Waste Management (Collection Permit) (Amendment) (No. 2) Regulations 2023; Waste Management (Facility Permit and Registration) Regulations 2007 – 2019 (as amended) (S.I (S.I. No. 821/2007);
- European Union (Waste Licensing) (Amendment) Regulations 2019; Waste Management (Packaging) Regulations 2014 to 2022 (as amended);
- Waste Management (Planning) Regulations 1997 (as amended) (S.I No. 137/1997); Waste Management (Landfill Levy) (Amendment) Regulations 2023;
- Waste Management (Food Waste) Regulations 2009 – 2015 (as amended);
- Waste Management (Hazardous Waste) Regulations 1998 to 2000; Waste Management (Shipments of Waste) Regulations 2007 (as amended) (S.I. No. 419/2007);
- Waste Management Act 1996 (as amended) (Act No. 10/1996);
- Environmental Protection Agency Acts 1992 – 2011 (as amended);
- Protection of the Environment Act 2003 (as amended) (Act No 27/2003);
- Litter Pollution Acts 1997 to 2009 (as amended);
- Planning and Development Act 2000 - 2023 (as amended) (Act No. 30/2000);
- Landfill Directive (2018/850) (EU, 2018a);

Guidelines:

- Guidelines on Information to be contained in environmental impact assessment reports (2022).
- Advice Notes for Preparing Environmental Impact Statements (Draft 2015).
- European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017).
- Wind Energy Ireland 'Health & Safety Series – Wind Farm Welfare Facilities
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Mapping Services:

- Gas Networks Ireland Dial Before You Dig Maps (DBYD).

- ESB Dial Before You Dig Maps (DBYD).
- EIR eMaps Open Eir Civil Engineering Infrastructure Service.
- Uisce Éireann Utility Mapping.
- Longford County Council Drainage Records.

Consultation:

- Consultation reports and feedback from stakeholders as outlined in the appended reports.