# 4. POPULATION AND HUMAN HEALTH

## 4.1 INTRODUCTION

This chapter examines the existing environment, assesses the likely significant effects on population and human health and identifies mitigation measures to avoid or reduce significant effects arising from the construction, operation and decommissioning of the proposed project.

The proposed project is described in Chapter 2 – Description of the Proposed Project.

Population and human health are addressed under separate headings throughout this Chapter. The assessment of population considers the current land use of the Proposed Project, the current activities occurring within and in the vicinity of the Proposed Project, local population information, employment profiles, tourism, visitor attractions and community gain opportunities. The assessment on human health includes a detailed literature review of studies and research carried out on the potential effects of wind farm developments on human health.

This population and human health assessment considers the likely significant environmental effects arising from the activities associated with the Proposed Project during construction, operation and decommissioning on the population and human health receptors (hereafter referred to as 'sensitive receptors') within the study area (see Sections 4.2.1 and 4.3.1 for more information on the scope of the assessment and study area).

Likely significant effects related to the construction and operation of the proposed GCR and the proposed TDR accommodation areas during the construction phase are also considered.

The likely significant effects of the Proposed Project on other environmental factors which may also have an effect on population and human health, as set out in Chapter 7 - Land, Soils and Geology, Chapter 8 – Hydrology and Hydrology, Chapter 9 - Noise and Vibration, Chapter 10 - Shadow Flicker, Chapter 11 - Air Quality, Chapter 12 – Climate, Chapter 13 – Landscape and Visual, Chapter 15 - Material Assets and Chapter 16 - Traffic and Transportation, are addressed in this Chapter and discussed in more detail in their respective Chapters. A separate chapter setting out the likely interactions between this assessment and other technical assessments is presented in Chapter 18 - Interaction of the Foregoing.

### 4.1.1 Relevant Guidance

This assessment has been carried out in accordance with the following guidelines:

- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);
- Environmental Protection Agency (EPA), Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022);
- European Commission (EC), Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017);
- Department of the Environment, Heritage and Local Government, Wind Energy Development Guidelines (2006);
- Department of Housing, Local Government and Heritage, Draft Revised Wind Energy Development Guidelines (2019);

- Institute of Public Health Ireland, Health Impact Assessment Guidance: Manual & Technical Guidance (2021); and
- Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects (July 2023).

### 4.1.2 Scope

Aspects which the EPA EIAR Guidelines (2022) state should be examined as part of the environmental assessment of population and human health include; *"employment, settlement patterns, land-use patterns, baseline population, human health (considered with reference to other headings, such as water and air), and amenity (e.g. effects on amenity uses of a site or of other areas in the vicinity may be addressed under the factor of landscape)"* .

The primary potential sources of likely significant effects from the proposed project on sensitive receptors have been identified as follows:

- Dust emissions from construction activities (construction and decommissioning phase);
- Noise and vibration emissions (construction, operational and decommissioning phases);
- Traffic emissions and disruption (construction and decommissioning phase); and
- Installed infrastructure (operational phase).

Likely significant effects on sensitive receptors in relation to the above sources are assessed in this EIAR in terms of land use, population trends, property receptors, property value, employment/economy, tourism and amenity, and human health.

### 4.1.3 Statement of Authority

This assessment has been carried out by Brian McDonnell, Assistant Project Manager/Environmental Scientist in TOBIN. Brian has more than four years' experience in environmental consulting including environmental impact assessment. Brian has considerable experience in the preparation of various impact assessments including those related to population and human health (human beings). Brian has a Bachelor of Civil Law and an MSc in Environmental Science from Trinity College Dublin.

This chapter has been reviewed by Orla Fitzpatrick, Technical Director in TOBIN. Orla has over 20 years' experience working in the delivery of EIA projects in environmental consultancy. She holds a BSc in Geophysics and MSc in Environmental Consultancy and is a Chartered Environmentalist. She has considerable experience as technical approver of environmental deliverables for major infrastructure projects.

## 4.2 METHODOLOGY

A desktop study and site visits in March 2024 and October 2025 were carried out in order to obtain relevant information pertaining to this population and human health impact assessment including a review of published information (Sections 4.2.3 and 4.2.4), and site visit reports, to gather information on the local receiving environment.

In order to establish a baseline and understanding of population and human health status of the local area of the proposed project, where available, data has been gathered at a local, county, regional and national level where available, and local property receptors have been identified within a 2 kilometer (km) radius of the proposed wind farm site; this distance is best practice when undertaking population and human health environmental impact assessment (EIA). In terms of census data, a period of 11 years has been reviewed, i.e., 2011 to 2022, to review local, regional and national change.

In terms of human health, the assessment also considers available Irish health statistics and surveys, as well as a literature review of research carried out on the potential effects of wind farm developments on human health.

### 4.2.1 Study Area

The assessment of population and human health primarily considers the proposed project and the surrounding area, the proposed GCR and TDR (see Chapter 2 – Project Description for more details). The assessment considered property receptors and residential amenity, as well as current land use and activities, occurring within and in the vicinity of the proposed wind farm site, as this is where the most likely significant effects on population and human health receptors may occur (hereafter referred to as 'sensitive receptors').

This assessment has considered the range of turbine dimensions cannot be confirmed at planning application stage and for which design flexibility has been sought, as outlined in Chapter 2 – Description of the Proposed Project. The proposed range of turbine parameters is limited to a variation of 5m in tip height, 14m in rotor diameter and 9.5m in hub height.

The study area for population and human health includes review of relevant information on a county and national scale but is mainly concentrated on the Electoral Districts (ED) within which the Proposed Project is located.

### 4.2.2 Consultation

As part of the EIA scoping process, an EIA scoping report was sent to a list of statutory and non-statutory consultees in December 2024 (refer to Chapter 1 – Introduction for full list of consultees). All consultation response letters are provided in Appendix 1-2. Consultation responses received that are relevant to the Population and Human Health assessment are outline below in Table 4-1. Community engagement was also carried out in the local area as described in Chapter 1 - Introduction, and the feedback obtained during this exercise has been addressed in the preparation of the EIAR.

**Table 4- 1: Consultation Responses relevant to Population & Human Health**

| Consultee | Summary of Response | EIAR Chapter / Section |
|---|---|---|
| Failte Ireland | Provided a copy of the updated Fáilte Ireland Guidelines (2023) for the Treatment of Tourism in an EIA for projects that involve tourism or may have an impact on tourism. Guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines. | • Section 4.4.2 |
| Leitrim County Council | Planning application shall be assessed against the policies and objectives contained within the Leitrim County Development Plan 2023-2029. Of relevance:<br>Section 4 – Economic Development<br>Section 5 – Tourism<br>Section 10 – Rural Development<br>Notes the following (relating to population and human health) will be considered by the Planning Authority:<br>• Impact on the residential amenities of the area.<br>• Impact on human health in relation to: Noise disturbance & Shadow flicker.<br>• Impact on visual amenities.<br>The scope of population and human health and the consideration of associated impacts extends to the assessment of those environmental factors which might lead to effects on human health (including noise, vibration, traffic and transportation, air quality, amenity, water quality & flood risk).<br>An assessment of the impact of the proposed development on any local recreational and tourist facilities and overall level of amenity and the potential impacts arising for population and human health should be addressed in the EIAR. | • Planning Statement accompanying planning application<br>• Section 4.1.1.<br>• Chapter 9 Noise and Vibration<br>• Chapter 10 – Shadow Flicker<br>• Chapter 11 – Air Quality<br>• Chapter 12 – Climate<br>• Chapter 15 – Material Assets<br>• Chapter 16 – Traffic and Transportation |
| Fermanagh and Omagh District Council (FODC) | The potential impact on tourism, including impacts on tourism within FODC will be an important material consideration. Of relevance will be the Council's Visitor Experience Development Plan (VEDP) for Fermanagh Lakelands and Omagh and the Sperrins is a 10-year roadmap for tourism in the area.<br>Provided a link to the Visitor Experience Development Plan – Fermanagh & Omagh District Council. | • Planning Statement accompanying planning application<br>• Section 4.4.2.2.6 |
| Love Leitrim (as part of the 2021 Consultation) | The Scoping Report is to be made available to the public for public consultation in line with the most recent relevant legislation. | • Chapter 1 – Introduction |

| | | |
|---|---|---|
| | Details surrounding the community benefit fund are to be outlined within the EIAR.<br><br>The reasoning and feasibility of a 750m buffer zone with consideration to population and human health is to be outlined.<br><br>Telecommunications mast on Dough Mountain to be assessed sufficiently to ensure no interference with broadband services both existing and future potential.<br><br>Fowley's Falls tourist locations in Rossinver and Sean Mac Diaramada heritage site to be considered during assessment, as it was not noted in the scoping report. | • Section 4.4.2.2.2<br>• Section 4.3.2.3<br>• Appendix 1-1 – EIA Scoping Report<br>• Chapter 15 – Material Assets<br>• Appendix 15-1 – Telecommunications Impact Assessment<br>• Chapter 18 – Interaction of the Foregoing.<br>• Section 4.4.2.2.6<br>• Section 4.3.2.6.2 |
| Uisce Éireann | Where the proposed project has the potential to impact a drinking water source or potential impacts on water resources including contributing catchments of abstraction points, details of measures are to be taken to ensure that there will be no negative impact during construction and operational phases of the proposed project. | • Section 4.3.3.3.2<br>• Chapter 8 - Hydrology and Hydrogeology<br>• Chapter 15 - Material Assets |

### 4.2.3 Population

A desk study was carried out in order to examine relevant information relating to this population and human health impact assessment. A local population and socio-economic profile has been established and described in terms of available relevant census data obtained primarily from the CSO. Information on population statistics, land use, employment and socio-economic data for the areas surrounding the proposed wind farm site have been obtained predominantly from the 2011 to 2022 Census of Ireland.

The study area for the Population and Human Health assessment comprises of the Electoral Divisions (EDs) within which the proposed project is located and those which directly neighbour the proposed wind farm site (See Table 4-2 below). Data has been captured on an ED basis as this division has been considered the most appropriate scale for collated census data and is commonly used for defining the existing population profile. EDs were considered the appropriate way to choose the study area extents based on professional judgement as they cover a wide area around the proposed project boundary, and as there is a wide range of data available from the Census publications for each ED. EDs are the smallest legally defined administrative areas in the State that are published within the Census Small Area Population Statistics (SAPS). As such, this means that it is possible to get accurate baseline data that represents the area within which the proposed project is located. The EDs included within the assessment are for the proposed wind farm site. Due to the scale and temporary nature of the proposed TDR and GCR accommodations, they have been scoped out of the population assessment.

A significant focus is given to the EDs within which the proposed wind farm site is located due to the proportion of large scale works predominantly located here. A secondary focus is given

to the EDs within which the proposed GCR and proposed TDR accommodation areas will occur, these areas are lesser in scale and duration than those at the proposed wind farm site.

To identify a baseline in terms of local sensitive receptors, a distance of up to 2 km from the wind farm site boundary is best practice and typically considered for identifying sensitive receptors (i.e. through identifying properties where sensitive receptors may reside) for the population and human health assessment. This distance may be extended depending on the location of population centres, density of receptors or specific local considerations. For this assessment due to the location of the proposed wind farm, the 2 km radius was not extended. All properties within a 2 km distance have been identified and reviewed through available aerial mapping, GeoDirectory and ground-truthing.

There are no statutory guidelines in respect of how far from the site boundary or proposed turbines this assessment should extend for the purpose of population and human health impacts and assessment, however the distances identified as part of the assessment of other environmental factors (e.g., air quality, noise, landscape and visual and shadow flicker) are useful references.

In summary, the desk study with respect to population included the following activities:

- A review of GeoDirectory and the ground-truthing of data in order to identify property receptors within and surrounding the proposed wind farm site were most recently conducted in March 2024 (accessed January 2026);
- A review of Tailte Éireann Mapping, EPA Maps comprising CORINE 2018 data and aerial photography to establish current land use and settlement patterns, as well as relevant amenity facilities, surrounding the proposed project (accessed January 2026);
- A review of the most recent information available regarding population statistics, employment and social data for the areas surrounding the proposed project have been obtained primarily from the CSO. Information to establish a population profile, settlement demographics and the economic context of the study area on population statistics, land use, employment, and socio-economic data for the areas surrounding the proposed project have been obtained predominantly from the 2011 to 2022 Census record period (accessed January 2026);
- A review of tourism data including Fáilte Ireland, Tourism Ireland, Discover Ireland, and available local websites to identify visitor attractions within the study area and tourism data and performance in the local and wider county. (accessed January 2026).
- A planning application search has been undertaken as part of this EIAR to identify proposed and consented, but as yet not built, developments (provided in Appendix 1-6);
- A review of information sources identifying walking and cycling routes and other Rights of Ways in the vicinity of the proposed project (e.g., Trails.ie And Sports Ireland as listed in Chapter 1).

Ground truthing was undertaken in March 2024 and October 2025 to verify descriptions and information of the local area and thus inform the impact assessment.

The following key information sources and guidance have been used in the completion of the population aspect of this Chapter:

- CSO – 2022[1], 2016[2] and 2011[3] Census;
- CSO Health Survey Data[4];
- Department of Health (Government of Ireland), Health in Ireland: Key Trends 2024 Surveys (February 2024[5]);
- Fáilte Ireland, *EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects[6]);*
- Healthy Ireland (Government of Ireland) Surveys[7];
- Health Service Executive (HSE) Website[8];
- Irelands Hidden Heartlands – Heritage Ireland Website[9];
- Institute of Public Health Ireland, *Health Impact Assessment* (2009) [10]
- Institute of Environmental Management and Assessment (IEMA), *Health in Environmental Impact Assessment - A Primer for a Proportionate Approach* (2017) [11]
- IEMA Guide - Effective Scoping of Human Health in Environmental Impact Assessment (2022)[12];
- IEMA Guide - Determining Significance for Human Health in Environmental Impact Assessment (2022)[13];
- Leitrim County Development Plan 2023 – 2029[14];
- Sports Ireland Walking trails information[15][16] [17].
- World Health Organisation (WHO), *Environmental Noise Guidelines for the European Region* (2018)[18];
- WHO, *Night-time Noise Guidelines for Europe* [19](2009); and

[1]: https://www.cso.ie/en/statistics/population/censusofpopulation2022/ (accessed January 2026)
[2] https://www.cso.ie/en/census/census2016reports/ (accessed January 2026)
[3] https://www.cso.ie/en/census/census2011reports/ (accessed January 2026)
[4] https://www.cso.ie/en/releasesandpublications/ep/p-ihsmr/irishhealthsurvey2024-mainresults/data/ (accessed January 2026)
[5]https://www.gov.ie/en/department-of-health/collections/health-in-ireland-key-trends-2024/ (accessed January 2026)
[6]https://consult.eirgrid.ie/en/system/files/materials/2656/2740/F%C3%A1ilte%20Ireland%20EIAR%20Guidelines.pdf (accessed January 2026)
[7]https://www.localgov.ie/national-programmes/healthy-ireland#:~:text=Healthy%20Ireland%20is%20a%20government-led%20initiative%20that%20seeks,health%20and%20wellbeing%20of%20everyone%20living%20in%20Ireland (accessed January 2026)
[8] https://www.hse.ie/ (accessed January 2026) Website reviewed Q3 2025
[9] https://heritageireland.ie/visit/irelands-hidden-heartlands/ (accessed January 2026)
[10] https://instituteofpublichealth.org/hia (accessed January 2026)
[11]https://www.researchgate.net/publication/316968065_Health_in_Environmental_Impact_Assessment_a_primer_for_a_proportionate_approach (accessed January 2026)
[12] iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf
[13]https://www.academia.edu/111387201/IEMA_Guide_Determining_Significance_for_Human_Health_in_Environmental_Impact_Assessment (accessed January 2026)
[14]https://www.leitrim.ie/council/services/planning-building/forward-planning-development/leitrim-county-development-plan/leitrim-county-development-plan-2023-2029/ Website reviewed October 2025
[15] https://www.sportireland.ie/outdoors/walking/trails Website reviewed October 2025
[16] https://www.sportireland.ie/outdoors/find-your-trails Website reviewed Q3 2025
[17] http://trails.ie/index.phpWebsite reviewed Q3 2025
[18] https://www.who.int/europe/publications/i/item/9789289053563 Website reviewed October 2025
[19] https://www.who.int/europe/publications/i/item/9789289041737 Website reviewed October 2025

- WHO, *Global Air Quality Guidelines* (2021)[20].

### 4.2.4 Human Health

This assessment of the likely significant effects of the Proposed Project on human health is based on a comprehensive review of the relevant published literature on the subject (listed below and throughout each section where discussed). In this regard, it is important to assess the quality of available information reviewed.

The section below provides a summary of some of the available material in relation to potential effects of wind turbines on human health and an analysis of its scientific robustness. Aspects examined in this section primarily relate to the effects of wind farm developments on socio-economic activities and on local community health. These two themes are discussed primarily in this chapter but may be further addressed in other technical chapters, where relevant, as outlined in Section 4.1.

The following specific guidance documents have been consulted for the human health impact assessment:

- Institute of Public Health Ireland, *Health Impact Assessment Guidance: Manual & Technical Guidance* (2021)[21]
- Institute of Sustainability and Environmental professionals Institute of Sustainability and Environmental professionals Sustainability and Environmental professionals (ISEP), *Health in Environmental Impact Assessment - A Primer for a Proportionate Approach* (2017)[22];
- ISEP, 'Effective Scoping of Human Health in Environmental Impact Assessment' (2022)[23];
- ISEP, Determining Significance for Human Health in Environmental Impact Assessment (2022)[24];
- ISEP, Impact Assessment Outlook Journal Volume 8: Health Impact Assessment in Planning - Thought pieces from UK practice (2020); Institute of Public Health in Ireland (IPHI) Health Impact Assessment Guidance: A Manual. Standalone Health Impact Assessment and health in environmental assessment. (2021)
- World Health Organisation (WHO), *Environmental Noise Guidelines for the European Region* (2018);
- WHO, *Night-time Noise Guidelines for Europe* (2009)[25]; and
- WHO, *Global Air Quality Guidelines* (2021)[26].

[20] https://www.who.int/news-room/questions-and-answers/item/who-global-air-quality-guidelines Website reviewed October 2025
[21] Health Impact Assessment Guidance: A Manual and Case Study | Institute of Public Health Website reviewed October 2025
[22] (PDF) Health in Environmental Impact Assessment A Primer for a Proportionate Approach Website reviewed October 2025
[23] iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf Website reviewed October 2025
[24] (PDF) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment. Website reviewed October 2025
[25] Environmental noise guidelines for the European Region Website reviewed October 2025
[26] WHO Global Air Quality Guidelines Website reviewed October 2025

### 4.2.5 Assessment Criteria

The effects of the Proposed Project on the population and human health are assessed in accordance with the EIA Directive (2014/52/EU) and the EPA EIAR Guidelines (2022) as outlined in Chapter 1 - Introduction and described in the following sections. The assessment criteria as outlined in the EPA EIAR Guidelines (2022) is set out in Table 1-1 of Chapter 1. Regard has been given to other guidance and key information sources in relation to the assessment, however, as a statutory document, the EPA EIAR Guidelines (2022) are considered the most relevant and suitable for EIA in the Irish context.

The 2022 EPA EIAR Guidelines note 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 the EIAR e.g., under the environmental factors of air, water, soil, etc."* and that *"assessment of other health & safety issues are carried out under other EU Directives, as relevant. These may include reports prepared under the Integrated Pollution Prevention and Control, Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them"*.

The classification and description of effects follows the terms provided in Table 3-4 of the 2022 EPA Guidelines and are duplicated in Table 1-1, Chapter 1 - Introduction for reference.

#### *4.2.5.1 IEMA Guide on Effective Scoping of Human Health in Environmental Impact Assessment (2022)*

In November 2022, IEMA (now known as ISEP) in the UK published a guide to the 'Effective Scoping of Human Health in Environmental Impact Assessment' for use by EIA practitioners. The aim of this guide is to enable those responsible for commissioning, conducting, or reviewing an EIA to determine the scope of the human health chapter in EIA. The guide is focused on the scoping phase of the EIA process, including input to Scoping Reports and responses within Scoping Opinions. Where an EIA is undertaken and there is also a requirement for Health Impact Assessment (HIA) (i.e. where the potential for impacts to human receptors is identified in the EIAR through topics including visual, noise, water, etc.), projects should normally meet the HIA requirement through the EIA Report health chapter rather than having a standalone HIA report. As IEMA guidance has been fully adhered to when preparing this Chapter it is therefore considered to meet the HIA requirement. See Section 5.4.3 for further details.

#### *4.2.5.2 IEMA Guide on Determining Significance for Human Health in Environmental Impact Assessment (2022)*

In November 2022, IEMA published a guide to 'Determining Significance for Human Health in Environmental Impact Assessment'. The guide focuses on and discusses what 'significance' means for 'human health' in terms of EIA. The guide was produced in order to inform current practice and in anticipation of potential changes to the way that EIA is undertaken in the UK and Republic of Ireland. The guide also addresses inequalities and population health as environmental outcomes of a project. Regard has been given to the general approach put forward in this IEMA guidance when preparing this Chapter.

#### *4.2.5.3 Health Protection*

The assessment of human health for the proposed project, in terms of health protection, follows the approach set out in the 2022 EIAR Guidelines and in the EC's Guidance on the preparation of the EIAR. Human health protection is considered through the assessment of the environmental factors (pathways) through which health could be affected such as air, noise, water and soils. Potential noise, air, soils and water impacts which could affect human health are identified, the scale of these potential impacts and their duration are assessed, and the significance of the potential impact on human health is determined.

It should be noted that the identification of individual environmental hazards and the associated potential impacts and duration are undertaken in other chapters of this EIAR namely, Chapter 9 Noise and Vibration, Chapter 10 Shadow Flicker, Chapter 15 Material Assets, Chapter 11 Air Quality and Chapter 12 Climate. The associated significance in terms of the potential impact on human health is then considered in this chapter.

In the assessment of cumulative effects, any other existing, permitted or proposed projects in the surrounding area (see Chapter 4 (Policy, Planning & Development Context)) have been considered where they have the potential to generate in-combination or cumulative effects with the proposed project. The potential for cumulative effects on the local population and human health is considered below (see Section 4.7), while elements such as noise, shadow flicker, traffic and visual impacts are discussed in their respective chapters.

### 4.2.6 Assessment Limitations and/or Difficulties Encountered

No significant difficulties or limitations have been identified that apply to the population and human health assessment.

The assessment draws on the best available data and information, supported by site-specific information and online publicly available datasets in conjunction with professional judgment. Where standard or routine assumptions have been made, these are documented.

No limitations are considered to materially affect the reliability or robustness of the assessment outcomes.

## 4.3 Existing Environment

### 4.3.1 Study Area

The proposed wind farm site (see Figure 1-2 of this EIAR) is approximately 4.7 km long in the north/south direction and is approximately 4.4 km wide in an east/west direction at the widest point. The site is located 2 km northeast of Manorhamilton in north County Leitrim. Other nearby settlements include Kiltyclogher which is 2 km to the northwest and Rossinver which is 2 km to the northeast. The site is also located in close proximity to the Northern Ireland border in County Fermanagh which is approximately 3 km to the north.

The landscape is largely agricultural with areas of coniferous forestry occurring. In general terms, the area surrounding the site can be described as rural with a dispersed settlement type. The main urban centre in the region is Sligo town, located approximately 23 km to the southwest.

The proposed on-site substation will connect via a 110 kV underground cable to an existing ESBN substation in Srananagh, Co. Sligo. The total length of the grid connection is approximately 32 km, of which 30.6 km will be in the public road corridor, as shown in Figure 2-2. The remainder is located within Coillte lands and other private lands and a short section is within the proposed wind farm site. A more detailed description of the proposed GCR is outlined in Section 2.5.7.

A detailed description of the TDR is provided in Section 2.5.8. The port of entry chosen for turbine delivery is Killybegs Port in Co. Donegal, which is the closest port of entry to the site. The route extends through the functional areas of three local authorities – Donegal County Council, Sligo County Council and Leitrim County Council. The proposed wind farm site is located approximately 2.5km north of the N16 National Primary Road at its closest point providing relatively straightforward access to the national road network in the northwest of the country.

The proposed GCR is described in detail in Chapter 2. The proposed GCR utilises the existing public road network where possible prioritising the use of Local and Regional roads to reduce likely significant effects.

## 4.3.2 Population

### *4.3.2.1 Land Use*

The land use/activities on the proposed wind farm site are primarily commercial forestry, with some areas of pastoral agriculture. The surrounding landscape is a mixture of agricultural land and forestry, with an existing wind farm, Faughary Wind Farm, located to the west of the proposed wind farm site (approx. 550 m between T6 and nearest Faughary Turbine). The landscape is predominately undulating in the wider area, with the proposed wind farm site being located on an elevated area with a topography of between 280 m and 310 m Ordnance Datum (mOD). A number of other surrounding areas are also elevated. The most significant features in the surrounding landscape are the Dough and Thur Mountains, the upland areas containing the proposed wind farm site and Faughary Wind Farm.

The proposed wind farm has an area of approximately 231 hectares. The site lies between the R282 and the R283 on the northwestern side of the Dough /Thur Mountains. 'Dough/Thur Mountains NHA is an area of upland blanket bog, heath and grassland located 4 km south of Kiltyclogher, in north-west Co. Leitrim. The site includes two mountains, about 2 km apart, separated by the Cornavannoge River valley. The boundaries of the site are largely defined by transitions from blanket bog to rough pasture, areas of peat cutting or conifer plantation'[27].

The majority of the proposed GCR (approximately 30.6 km) is located on public roads (transport use), the offroad sections are predominantly pastoral agriculture and areas of commercial forestry cover.

The proposed TDR accommodation areas are also located mostly within the road corridor and along road verges and will include temporary vegetation management, local strengthening of

[27] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002384.pdf Website reviewed October 2025

road edges and street furniture management to facilitate the transport of oversize turbine components to the wind farm site and subsequent reinstatement.

The nearest primary schools to the proposed project are Masterson's National School (140m TDR, 460m GCR, 2.37km WF), St Clares Primary School( 90m TDR, 790m GCR, 2.17km WF), and Gaelscoil Chluainin ( 240m TDR, 80m GCR, 2.45km WF) in Manorhamilton and St Michael's National School( 3.92km TDR, 6.14km GCR 2.05km WF) in Glenfarne, while the nearest post-primary school is St Clare's Comprehensive School( 260m TDR, 580m GCR, 2.57km WF) also in Manorhamilton. The nearest large third level campus is Atlantic Technological University (290m TDR, 12.27km GCR, 20.47km WF) located in Sligo Town.

Public transportation is not readily available in the wider area around the proposed wind farm site. The nearest trains are available from Sligo (MacDiarmada Station), located on the Dublin Connolly to Sligo line. Busses are available along the N16 from Manorhamilton to Enniskillen. The N16 is the nearest national road providing access to the area (via the R283) around the proposed wind farm site.

A number of community facilities and amenities are available in the locality, with Glencar Manorhamilton GAA club providing the nearest community amenities to the proposed wind farm site (adjacent to TDR, approx. 280 m from GCR, approx 2.7 km between the wind farm site and Bee Park Pitches). Manorhamilton is home to shops, supermarkets, restaurants, banks, pharmacies, Manorhamilton Primary and Mental Health Centre, Our Lady's Community Hospital, Bee Park Resource Centre and churches. Further amenities and services are available in Sligo town.

Further detailed description of the Proposed project is provided in Chapter 2 - Description of the Proposed Project.

#### *4.3.2.2 Population Trends*

In contrast to recent demographic trends towards urbanisation experienced by other counties, the Census 2022 indicates that Leitrim remains, in population terms, a predominantly rural county, with approximately 84.1% of the County's population identified as living in a rural setting.[28]

An examination of the existing population in the study area has been carried out to identify population trends, density and to define the properties/receptors surrounding the proposed wind farm site. Census data from the period 2011 – 2022 available from the CSO[29] has been summarised in Table 4-2 and Table 4-3. The proposed wind farm site works are located in the local authority area of Leitrim County Council and within the ED's of Manorhamilton, Kiltyclogher, Munakil and Ballaghmeehan for the wind farm. Due to the scale and temporary nature of the proposed TDR and GCR accommodations, they have been scoped out of the population trend assessment.

[28] https://westerndevelopment.ie/wp-content/uploads/2023/08/WDC-Census-2022-Summary-Report-for-Western-Region-July-2023-Final-18.07.23.pdf Website reviewed October 2025
[29] https://www.cso.ie/en/census/ Website reviewed October 2025

**Table 4-2: Population Demographics**

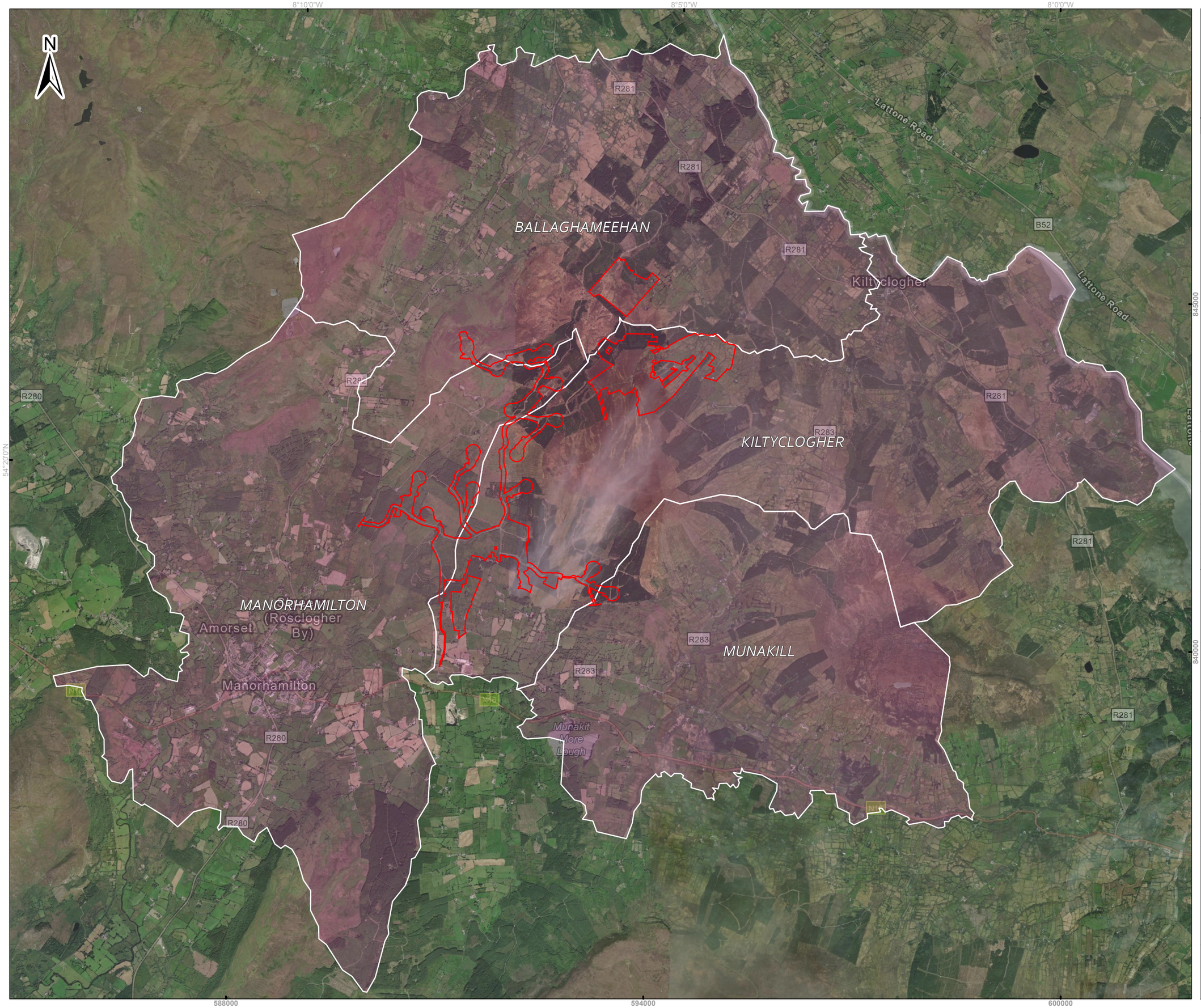
| Area | Population 2011 | Population 2016 | Population 2022 | % Change from 2011 - 2016 | % Change from 2016 - 2022 |
|---|---|---|---|---|---|
| State | 4,588,252 | 4,761,865 | 5,149,139 | 3.78 | 8.13 |
| Leitrim County | 31,798 | 32,044 | 35,199 | 0.77 | 9.85 |
| Sligo County | 65,270 | 65,535 | 70,198 | 0.41 | 7.12 |
| Donegal County | 160,927 | 159,192 | 167,084 | -1.08 | 4.96 |
| **EDs for the proposed wind farm site** | | | | | |
| Manorhamilton (28052) | 1782 | 1892 | 2064 | 6.17 | 9.09 |
| Kiltyclogher (28049) | 233 | 207 | 255 | -11.16 | 23.19 |
| Munakill (28053) | 196 | 169 | 186 | -13.78 | 10.06 |
| Ballaghameehan | 216 | 195 | 196 | -9.72 | 0.51 |
| **Total Wind Farm Area** | 2427 | 2463 | 2701 | 1.48 | 9.66 |

Results from Census 2022 show that the population of Leitrim grew by 9.85% to 35,199 from 2016, which means the number of people in the county rose by 3,155 between April 2016 and April 2022. During the same period, Ireland's population rose nationally by 8.13% from 4,761,865 to 5,149,139. The EDs within which the proposed wind farm site is located had a collective population of 2,701 in 2022 in contrast to 2,472 in 2016, this represents a growth of 9.66%. This illustrates that the population of the local area is increasing at a rate that is slightly greater than the National rate and approximately in alignment with County Leitrim's growth.

The location of the proposed project in the context of the above ED's is shown in Figure 4-1 below.

Population density is a useful indicator of the settlement patterns in the area surrounding the proposed project and County Leitrim overall. Table 4-2 shows population density for the study area as well as County Leitrim and shows a generally sparser population in the study area compared with the overall county[30].

[30] CPNI06 - Population Density - Ireland and Northern Ireland Website reviewed October 2025





**Legend**

- Application Boundary
- Electoral Divisions

0 0.5 1
Kilometers

**Spatial Reference**
Datum: IRENET95
EPSG: 2157



| Rev | Date | Description | By | Chkd. |
|---|---|---|---|---|
| A | 23/04/2026 | First issue | S.P | S.R |

Client: FuturEnergy Ireland

Project:
Lissinagroagh Wind Farm

Title:
Figure 4-1:
Electoral Divisions at
the Proposed Wind Farm

Scale @ A3: 1:50,000

| Prepared by: | Checked by: | Date: |
|---|---|---|
| S.Pezzetta | S.Ryan | April 2026 |

TOBIN
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www.tobin.ie



Map Ref: 10955-062-EDs-P.App.BO-TOB-A

Draft: A

Table 4-3: Population Density of EDs

| Area | Population Density 2022(persons/km$^2$) |
|---|---|
| State | 73 |
| Leitrim County | 22.2 |
| Sligo County | 38.2 |
| Donegal County | 34.4 |
| **EDs for the proposed wind farm site** | |
| Manorhamilton | 61 |
| Kiltyclogher | 8 |
| Munakil | 9 |
| Ballaghameehan | 7 |
| **Study Area Average** | **21.25** |
| **Additional EDs for the proposed GCR** | |
| Cloonlogher | 9 |
| Drumahaire | 50 |
| Killanummery | 18 |
| Drumcolumb | 11 |
| Ballynakill | 23 |
| **Additional EDs for the proposed TDR** | |
| **Leitrim** | |
| Glenboy | 9 |
| Lurganboy | 15 |
| Sramore | 14 |
| Glencar | 8 |
| **Sligo** | |
| Drumcliff east | 55 |
| Calry | 40 |
| Sligo north | 1222 |
| Drumcliff west | 123 |
| Carney | 32 |
| Lissadill East | 50 |
| Rossinver West | 13 |
| Lissadill North | 80 |
| Cliffony South | 29 |

| Area | Population Density 2022(persons/km$^2$) |
|---|---|
| Cliffony North | 50 |
| **Leitrim** | |
| Tullaghan | 30 |
| **Donegal** | |
| Bundoran Rural | 53 |
| Bundoran Urban | 540 |
| Carrickboy | 26 |
| Ballyshannon Urban | 479 |
| Ballyshannon Rural | 46 |
| Cavangarden | 13 |
| Ballintra N/S | 19/26 |
| Laghy | 19 |
| Tullynaught | 19 |
| Donegal | 133 |
| Tantallon | 58 |
| Bonnyglen | 16 |
| Inver | 33 |
| Dunkineely | 42 |
| Tieveskeelta | 6 |
| Killybegs | 78 |

#### *4.3.2.3 Property/Receptors*

The locations of properties and buildings (referred to as receptors) in the vicinity of the proposed Wind Farm site have been identified using address data from the Geodirectory database which is used to populate Eircodes.

The validity of the Geodirectory data has been confirmed by way of publicly available mapping, aerial imagery, street-level imagery and ground truthing survey carried out in March 2024 and October 2025. All receptors within 2 km of the proposed wind farm site boundary have been identified and verified by means of the above desktop reviews and site surveys. This information is used to inform assessments within this EIAR, in particular for shadow flicker analysis (Chapter 10) and noise modelling (Chapter 9). The locations of these receptors in relation to the proposed wind farm site are shown in Appendix 4-1 and Appendix 4-2. In addition, a search of planning applications within 2 km of the proposed wind farm site boundary was carried out (most recently in March 2026) to identify proposed developments and consented, but as yet not built, developments.

A total of 521 no. receptors from the Geodirectory database, ground truthing exercise and planning search were identified. A breakdown of the properties identified, along with their property type, is outlined in Table 4-4.

**Table 4-4: Receptors Identified within the 2 km of the proposed Wind Farm Site**

| Property Type | No. |
|---|---|
| Residential | 496 |
| Commercial | 11 |
| Derelict | 6 |
| Planning applications (potential residential receptors) | 3 |
| Other (e.g. sheds) | 5 |
| **Total property receptors identified within 2 km** | 521 |

During the verification process, properties/buildings that would not be considered sensitive receptors (i.e. farm sheds, garages, commercial buildings, etc.) or that were not deemed habitable without requiring planning permission to remedy were identified. Habitability was determined during field surveys conducted by Brian McDonnell in March 2024 whereby buildings deemed derelict or uninhabitable were assessed. Structural disrepair and roof failure were the primary markers used for dereliction. Any developments submitted for planning or consented (but as yet unbuilt) developments were included, but any such properties that would not be considered sensitive as described above were omitted. From the planning search, any invalidated planning applications or consented (but unbuilt) developments where the expiry period for development had elapsed were excluded. Of the 496 properties identified, 108 are within 1 km of the proposed wind farm site. The closest sensitive receptor is a residential properly located approximately 763 m from the nearest proposed turbine location (T14) The second closest sensitive receptor is a residential properly located approximately 784 m from the nearest proposed turbine location (T3). Both properties are in excess of the minimum setback requirement of 500 m set out in the 2006 WEDGs. The 2019 Draft WEDGs recommend a minimum setback distance from a turbine to the curtilage of a residential property equal to 4 times the turbine tip height or 500 m, whichever is largest. The proposed project provides for the installation of turbines with a maximum height of up to 185 m, therefore the minimum setback distance required in accordance with the 2019 Draft WEDGs is 740 m. A minimum 750 m buffer will be extended from the location of any proposed turbines to sensitive receptors. The proposed project exceeds the 4 times the turbine tip height requirement.

As part of the community engagement process and public consultation, the sensitive receptors identified in Appendix 4-1 and Appendix 4-2, as well as other local residents up to 2 km from the proposed wind farm site, were the main focus of initial project engagement to inform them of the proposed project and to gather their feedback on the project. Further information on the public consultation process is provided in Chapter 1 (Introduction).

#### *4.3.2.4 Property values*

Data available from the CSO on property values is presented in terms of Eircode Routing Key areas. The proposed wind farm site is located within one Eircode Routing Key boundaries,

(namely F91: Sligo). The CSO data for the year to July 2025[31] show that the median price of residential properties sold across the area is €250,000. The national median house price is €374,999.

The latest RPPI data release shows that overall residential property prices rose by 7.5% in the 12-months to July 2025, a marginal decrease from 7.9% in the year to June 2025 (the previous CSO RPPI release). Property prices in Dublin increased by 6%, and property prices outside Dublin rose by 8.7% when compared to the same period a year earlier (July 2024) (CSO, 2025)[32]. Nationally house prices rose by 7.7%, apartment prices increased by 6.0%. Dublin house prices grew by 6.2%, while apartment prices grew by 5.3%. Outside of Dublin, house prices grew by 8.7% and apartment prices were up by 7.5%.

The national index has grown to the value of 197.7, which equates to 20.9% above its highest level at the property boom peak in April 2007. Dublin residential property prices are 6.8% higher than their February 2007 peak, while residential property prices outside of Dublin are 23.0% higher than the May 2007 peak.

Nationally, the lowest median price paid for a dwelling was €195,000 in County Leitrim, and the highest was Dún Laoghaire-Rathdown, County Dublin at €675,000. The CSO states the most expensive Eircode area over the 12-months to January 2025 according to the RPPI was A94 'Blackrock' (median price of €795,000) in County Dublin. Outside of Dublin the most expensive Eircode area over the last 12 months was A98 'Bray' (median price of €549,999), while F45 'Castlerea Roscommon' was the least expensive (median price of €150,000) (CSO, 2025).

#### 4.3.2.4.1 Wind Farms and Property Values

A UK study, entitled '*The effect of wind farms on house prices*', was carried out by the Centre of Economics and Business Research (CEBR) in March 2014. The key findings of the study were:

- Overall, the analysis found that country-wide property market drives local house prices, not the presence or absence of wind farms; and
- The econometric analysis established that construction of wind farms at the sites examined across England and Wales has not had a detectable negative impact on house price growth within a 5 km radius of the sites.

However, a similar study by the London School of Economics (LSE) Spatial Economic Research Centre found an average reduction in the value of houses (based on 125,000 house sales between 2000 and 2012) of between 5% and 6% within 2 km of wind farms (Gibbons, 2014). These contradicting studies led to further research in Scotland in 2016 (ClimateXChange, 2016) which was based on analysis of over 500,000 property sales in Scotland between 1990 and 2014. This study, again, found no evidence of a negative impact from wind turbines on house prices and suggests that *"generally speaking the effect is either positive…or not distinguishable from zero"*.

[31] https://www.cso.ie/en/interactivezone/visualisationtools/housepricesbyeircode/ Website reviewed October 2025
[32] Residential Property Price Index July 2025 - Central Statistics Office Website reviewed October 2025

The authors of the report tried to explain why the research carried out in Scotland found a very different result to that carried out in England even though the approach was very similar to that used in the LSE study. They suggested a number of possibilities including:

- Attitudes towards wind farms may be different in Scotland than in other parts of the UK, In Scotland, a much higher proportion of turbines are likely to be located on moors and mountains and in more remote areas than in England and Wales; and
- Some wind farms, especially in Scotland, enhance the local area by providing tracks for walkers, cyclists, horse riders and other members of the community, as well as community benefit funds.

Large scale studies in United States have indicated that there is no conclusive evidence of any effect on property values located in close proximity to wind farms. A study entitled *A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States* by Lawrence Berkley National Laboratory in 2013, carried out sampling in over 51,000 homes across nine US states. The range of distances examined accounted for as far as 10 miles away (approximately 16 km) but also considered 1,198 homes within 1 mile (approximately 1.6 km) of turbines.

Presently, there is one Irish based study that has examined the effect of wind farms on property values, entitled '*Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach*' (Gillespie & McHale, 2023). This paper reviewed wind turbine developments in the west of Ireland including Leitrim, and associated property values. The study used satellite imagery to identify individual turbines and sourced local housing data from Irish property website 'daft.ie'. Although prices published on daft.ie are not necessarily equivalent to the price agreed on final sale of a property, the assumption was made that property listing and sale agreed prices correspond. The findings of the study indicated a potential decrease in property values of approximately -14.7% within a radius of 0-1 km of a wind turbine. It should be noted that the sample size considered within this range was small, approximately 225 houses, which does not fully represent the distribution of wind turbines and broader landscape of Irish rural residential properties. Furthermore, the paper states that there are "*no significant reduction in house prices beyond 1 km*" and that the effects seen within the 0-1 km radius were not persistent and were seen to diminish over the operational lifetime of the wind turbines (Gillespie & McHale, 2023).

#### 4.3.2.4.2 Public perception of wind farms

**Scotland and Ireland Survey 2005**

In 2005, published the results of a survey conducted on the perception of wind power in Scotland and Ireland (Warren *et al*., 2005). The study aimed to find the degree to which people support or oppose wind power, and the respective reasons for such attitudes. The surveys were conducted around the localities of existing and planned wind farms in Ireland and Scotland, key findings included:

- The large majority of those surveyed indicated that they are greatly in favour of their local wind farm, with their personal experience having prompted their positive attitude. In Ireland, survey results indicated 92% support for the development of wind energy in the country, with results showing a high level of support for renewable energy;

- The study found that the 'not in my back yard' (NIMBY) effect is much more pronounced in relation to proposed wind farm developments than with existing wind farms;
- Reasons provided by respondents for their positive view of local wind farms were primarily related to positive aspects including, promotion of renewable energy, moving away from fossil fuels, and environmental protection;
- The surveys found that wind farm developments with small numbers of large turbines are usually preferred over developments with large numbers of smaller turbines;
- In Ireland, survey results support the Scottish results, showing an increase in positive attitudes to wind power through time and proximity to wind farms. Data recorded from Irish respondents indicate that those who regularly see the wind farms are generally most accepting of the visual impact. The study further states that the majority of those with direct experience of wind farms do not think that they have had any adverse impact on wildlife, tourism, scenic beauty or property values; and
- Overall, the study results indicate "a clear pattern of public attitudes becoming significantly more positive following personal experience of operational wind farms" (Warren *et al*., 2005).

**Sustainable Energy Authority of Ireland (SEAI) National Survey 2023**

In May 2023, the SEAI published their latest survey findings regarding attitudes towards wind and solar energy farms. The objective of the survey was to provide insight on public attitudes to commercial wind and solar energy farms in Ireland, to help inform an "*equitable and socially sustainable energy transition"* (SEAI, 2023). The SEAI's survey is an initial step to track the impact of projects developed under the government's Renewable Electricity Support Scheme (RESS). Key findings from the research are:

- *"Most households close to new wind or solar power projects have positive attitudes to the project close to them;*
- *Across rural Ireland, general levels of support for wind and solar energy projects remain very high, regardless of whether people live close to new projects or far away;*
- *A large majority of the public living in rural areas supports government policies that secure financial benefits for households and communities close to new renewable energy infrastructure projects through 'Community Benefit Funds';*
- *Most people feel like they and their communities can have a say in the planning process. However, many still feel that the planning process is unfair, and that more effort should be made with community engagement and careful siting of projects;*
  *The national survey of attitudes is an early step in a long-term research programme to understand the socio-economic impacts of the RESS policy. To date, SEAI has commissioned studies to understand the ways in which community engagement in wind energy can be improved.*

#### *4.3.2.5 Employment/Economy*

Employment is an important indicator of the economic standing of an area. This section examines employment status and unemployment levels in the region of the proposed project. The Labour Force Survey undertaken by the CSO provides details of unemployment on a

regional level. As Leitrim is located in the Border Region (IE01)[33], data for this region is used to illustrate unemployment in the area. The key findings from the Q2 2025 Labour Force Survey (latest available data at the time of writing) published by the CSO[34] are outlined in the following sections Table 4-5 provides an economic and workforce outlook of the Border region, Dublin and the state.

**Table 4-5: Employment Trends**

| Region | Quarter /Year | Numbers in employment (000's) | Unemployment (000's) | Labour force | Unemployment rate | Participation Rate |
|---|---|---|---|---|---|---|
| Border | Q2 /2024 | 209.2 | 8.9 | 218.1 | 4.1% | 62.3% |
| Dublin | Q2 /2024 | 834.6 | 40.8 | 875.4 | 4.7% | 69.6% |
| State | Q2 /2024 | 2,754.2 | 131.2 | 2,885.4 | 4.6% | 66% |
| Border | Q2 /2025 | 215.4 | 9.3 | 224.6 | 4.2% | 63.3% |
| Dublin | Q2 /2025 | 842.4 | 44.8 | 887.2 | 5.1% | 68.8% |
| State | Q2 /2025 | 2,818.1 | 140.8 | 2,958.9 | 4.8% | 66.4% |

Table 4-5 illustrates the findings from the Quarter 2 2024/Quarter 2 2025 Labour Force Survey published by the CSO[35]. The unemployment rate in Table 4-5 is the number of unemployed persons expressed as a percentage of the total labour force (aged 15 – 74). The unemployment rate for the State in Quarter 2 2025 was 4.8% while the unemployment rate for the Border Region was 4.2% showing that unemployment in the region (in Quarter 2 2025) was lower than the State.

The participation rate is the number of persons available to the labour force (i.e. persons from 15 – 74 years old either working or looking for work) expressed as a percentage of the total population. In Quarter 2 2025, the participation rate in the State was 66.4% compared with 63.3% in the Border Region so these rates are comparable.

[33] NUTS 3 – Nomenclature of Territorial Units for Statistics (NUTS) created by Eurostat Website reviewed October 2025

[34] https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter42024/ Website reviewed October 2025

[35] Labour Force Survey Quarter 2 2025 - Central Statistics Office Key Findings Labour Force Survey Quarter 3 2024 - Central Statistics Office Website reviewed October 2025

The CSO also publishes figures relating to the Live Register. These figures are not strictly a measure of unemployment as they include persons who are legitimately working part-time and signing on part-time. However, the Register can be used to provide an overall trend within an area. In August 2024, there were 17,316 persons on the Live Register in the Border region, which has decreased from 16,321 from August 2025 which represents a decrease of 6.27%. The state figures for the live register in August 2025 were 177,600 which has decreased from 177, 868 from August 2024 which represents a decrease of 0.15%[36]

#### *4.3.2.6 Tourism*

The National Tourism Development Authority (Fáilte Ireland) periodically collates statistics on overseas visitors to Ireland and regions within the country. 2024 Failte Ireland statistics indicate that overseas tourism to Ireland is experiencing a positive direction of growth, 6.6 mn overseas visitors visited Ireland representing a 6.7% growth from 2023. The associated projected revenue from overseas visitors also increased from 2023 by 13% to approximately €6.2 bn. While overseas tourism numbers and associated spend has grown, the respective nights spent by tourists has on average declined by 3% in 2024[37]. North America represents the greatest proportion of overseas visitors. ITIC suggests that 2025 overseas tourism growth will be more reserved in tourist numbers, but that revenue could grow anywhere between 5-7%.[38]

The border region experienced approximately 504,000 of these visitors and €130 mn worth of associated revenue in 2024. Northern Irish and British tourists rather than Americans represent the largest tourist group in the Border region.[39] The 5 most visited tourism attractions in County Leitrim are listed along with their respective visitor totals in Table 4-6.

[36] Live Register August 2024 - Central Statistics Office Website reviewed October 2025
[37] https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Research/Key%20Tourism%20Facts%20and%20Figures%202024/FI_Key-Tourism-Facts-2024_National-Summary_1.pdf?ext=.pdf Website reviewed October 2025
[38] https://www.itic.ie/ye24-outlook25/ Website reviewed October 2025
[39] https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Research/Key%20Tourism%20Facts%20and%20Figures%202024/FI_Key-Tourism-Facts-2024_National-Summary_1.pdf?ext=.pdf Website reviewed October 2025

**Table 4-6: Leitrim Tourism Top 5 Tourism Attractions by visitors in 2023**

| Visitor Attraction | Total Visitors |
|---|---|
| The Shed Distillery, Drumshanbo | 50,000 |
| Parke's Castle | 17,281 |
| St George's Heritage Centre | 2,191 |
| Rainbow Ballroom of Romance | 1,500 |
| Glenview Folk Museum | 1,500[40] |

Fáilte Ireland tourist literature for County Leitrim was examined in relation to tourism amenity in conjunction with the websites of relevant tourism assets, locations and amenities in the area. County Leitrim is located in Ireland's Hidden Heartlands, a branding initiative developed by Fáilte Ireland *"to drive recovery and growth of the visitor economy in Ireland's Hidden Heartlands to create sustainable, high-quality jobs that will support and strengthen local communities while protecting our natural environment.[41]"*. County Leitrim is also located along Ireland's Wild Atlantic Way, another branding initiative which has provided an economic engine for the west of Ireland. Fáilte Ireland estimates that almost 2 million more tourists visited the Wild Atlantic Way in 2023 than in 2013[42]. Information on other tourist attractions and initiatives in the area has been sourced from relevant websites, such as Discover Ireland, Visit Leitrim, Tourism Ireland, those hosted by the Leitrim Tourism Board and published literature.

#### 4.3.2.6.1 Tourism in Leitrim Review and Framework 2023-2027

The Tourism in Leitrim Review and Framework 2023-2027 "presents a review and analysis of tourism in Leitrim and a framework and action plan that will guide the development and management of sustainable tourism growth throughout the county over the next five years." County Leitrim is positioned within two destinations brands, parts of County Leitrim are in Ireland's Hidden Heartlands and on the Wild Atlantic Way, both are initiatives developed by Failte Ireland to support tourism. The tourist figures and associated revenue generated in 2019 by the two initiatives are displayed in Table 4-7[43].

[40] https://www.failteireland.ie/Research-Insights/Activities/visitor-numbers-to-attractions-dashboard.aspx Website reviewed October 2025
[41] Ireland-s-Hidden-Heartlands-Regional-Tourism-Development-Strategy.pdf Website reviewed October 2025
[42] 10 Years of the Wild Atlantic Way by DiscoverIreland - Issuu Website reviewed October 2025
[43] tourism-in-leitrim-review-framework-2023-2027.pdf Website reviewed October 2025

**Table 4-7: Tourist numbers (2019) and associated revenue with Irish tourism Brands**

| Brand | | Overseas | Domestic | N Ireland | Total |
|---|---|---|---|---|---|
| Ireland's Hidden Heartlands | **Tourists** | 449,000 | 784,000 | 120,000 | 1.3mn |
| | **Revenue** | €178mn | €129mn | €34mn | €3.4mn |
| Wild Atlantic Way | **Tourists** | 3.4mn | 5.0mn | 605,000 | 9mn |
| | **Revenue** | €1.9bn | €1.1bn | €186mn | €3.186bn |

Table 4-8 displays the county specific estimates for Leitrim with regards to tourist numbers and revenue generated from Ireland's Hidden Heartlands 2019. The county specific figures are estimated using an accommodation stock within the county[44].

**Table 4-8: Leitrim focused analysis with Ireland's hidden Heartlands**

| Tourist | Brand | Tourists | Revenue |
|---|---|---|---|
| Overseas | **Ireland's Hidden Heartlands** | 449,000 | €178mn |
| | **Leitrim** | 64,000 | €25mn |
| Domestic | **Ireland's Hidden Heartlands** | 784,000 | €129mn |
| | **Leitrim** | 112,000 | €18mn |
| N. Ireland | **Ireland's Hidden Heartlands** | 120,000 | €34mn |
| | **Leitrim** | 17,000 | €5mn |
| Total | **Ireland's Hidden Heartlands** | 1,353,000 | €341mn |
| | **Leitrim's share at 14% of IHH total** | 193,000 | €49mn |

Similar data for Leitrim's position on the 'Wild Atlantic way' is not available. However, approximately 33% of the county is covered by this initiative[45], Leitrim has approximately a 4km stretch of coastline at Tullaghan which is included in the Wild Atlantic Way as an official coastal stop. The Wild Atlantic Way spreads inland to include Manorhamilton as a Hinterland zone connecting to the Wild Atlantic way Coastal route the nearest town to the proposed wind farm site.

#### 4.3.2.6.2 Recreation and Attractions

The nearest attractions to the proposed project wind farm site are:

- Glens Art Centre, Manorhamilton46 approximately 2.3km southwest of the windfarm site.

[44] tourism-in-leitrim-review-framework-2023-2027.pdf Website reviewed October 2025
[45] tourism-in-leitrim-review-framework-2023-2027.pdf Website reviewed October 2025
[46] The Glens Centre | Welcome to Leitrim Website reviewed October 2025

- Fowley's Falls47, Rossinver, approximately 2.9km northeast of the windfarm site.
- Manorhamilton Castle48 approximately 5km west of the windfarm site.
- Sean Mac Dhiarmada's Cottage49 approximately 5km northeast of the windfarm site.
- Glenfarne demesne50 approximately 10 km east of the windfarm site.
- Glencar Waterfall51 17km northwest of the windfarm site.
- Hag's Leap52 approximately 17km northwest of the windfarm site.

Manorhamilton is a start point for several walking and cycling routes including the Manorhamilton Heritage Trail, the Melvin Loop, the Glencar Waterfall Cycle Route and the Family Cycle Route which is part of the Proposed Sligo Leitrim Northern Counties Railway Greenway[53]. The Shannon Erne Blueway is a recreational asset located in County Leitrim which acts as a tourism attraction. The series of water and land-based trails stretch from Leitrim Village to Belturbet in County Cavan. The Shannon Blueway runs from Leitrim through Roscommon as far as County Longford comprising of rivers, lakes and canals[54].

#### 4.3.2.6.3 Tourism and Wind Farms

Since onshore wind farms first began to appear in the landscape, there have been concerns about their potential impact on tourism, and whether tourists may be discouraged from visiting areas where wind farms can be seen. The following research has been conducted in Ireland and Scotland relating to tourist attitudes towards wind farms.

**Fáilte Ireland - attitudes to wind farms surveys 2007**

In 2007, Fáilte Ireland conducted a survey of domestic and overseas tourists to Ireland. The survey's purpose was to investigate if the development of wind farms impacts on the enjoyment of the Irish scenery by tourists. The survey involved face-to-face interviews in Northern Ireland) (Fáilte Ireland, 2007)[55]. The results of the survey indicate that most visitors are broadly positive towards the development of more wind farms in Ireland, (Fáilte Ireland, 2007). In terms of the perceived impact of wind farms on sightseeing, the Fáilte Ireland survey found that although almost half of tourists surveyed had seen at least one wind farm on their trip, the majority felt that their presence did not detract from the quality of their sightseeing, with the highest proportion of those surveyed (45%) saying that the presence of the wind farm seen had a positive impact on their enjoyment of sightseeing, (Fáilte Ireland, 2007).

[47] Fowley's Falls | Welcome to Leitrim, website reviewed March 2026
[48] Manorhamilton Castle | Welcome to Leitrim Website reviewed October 2025
[49] The Seán MacDiarmada Homestead | Welcome to Leitrim Website reviewed October 2025
[50] Glenfarne Demesne | Welcome to Leitrim Website reviewed October 2025
[51] Glencar Waterfall | Welcome to Leitrim Website reviewed October 2025
[52] Hag's Leap | Welcome to Leitrim Website reviewed October 2025
[53] Manorhamilton | Welcome to Leitrim Website reviewed October 2025
[54] Shannon-Erne Blueway | Welcome to Leitrim Website reviewed October 2025
[55] The results of the survey are presented in the Fáilte Ireland Newsletter 2008/No.3 entitled 'Visitor Attitudes on the Environment: Wind Farms'.

**Scotland – Wind farms and tourism trends survey 2017 and 2021**

In 2017, BiGGAR Economics published *'Wind Farms and Tourism Trends in Scotland'*[56]. to examine onshore wind development and tourism in Scotland. From 2009 to 2015 both onshore wind capacity and sustainable tourism grew suggesting that the two sectors can coexist. To assess potential local impacts the study analysed 28 wind farms and local tourism trends at both local authority level and within 15 km of wind farm sites. Across most areas, sustainable tourism employment increased and, in some cases, grew faster near wind farms than in the wider area. The study found no evidence that in the immediate vicinity of the wind farms that onshore development has a detrimental impact on wind farms.

Updated survey and report (2021)

In 2021, BiGGAR published an updated report[57] to further investigate if wind farms have discouraged tourism activity, and if there is evidence of such effects given the first commercial scale wind farms were established in Scotland over 25 years ago. Since 2009, the number of onshore wind turbines in Scotland has grown from 1,082 to 3,772 in 2019. Evidence shows that employment in tourism-related sectors also grew during the decade (increase of 20%) (BiGGAR, 2021). An analysis of the rates of change in tourism-related employment and the number of onshore wind turbines in local authority areas found that there is no correlation between the two factors (BiGGAR, 2021). Overall, the study found no relationship between tourism employment and wind farm development, be it at the level of the national economy, local authority areas or in the locality of wind farm sites (BiGGAR, 2021).

### 4.3.3 Human Health

While the specific health data/status of individuals living in the vicinity of the proposed project is confidential and cannot be established, a community profile has been identified to establish the baseline health profile of the area and compare this profile to the rest of the country. Evidence shows that different communities have varying susceptibilities to health impacts both positive and negative as a result of social and demographic structure, behaviour and relative economic circumstance. Whilst specific health data for individuals in the vicinity of the proposed project is confidential and difficult to establish, as has been detailed in Section 4.2.4, a community profile has been identified to establish the baseline health profile of the area and compare this profile to the rest of the country.

A group made up of the Health Services Executive (HSE) and the Irish Health Repository (IHP), known as Lenus, have published separate health profiles for all the Local Authorities areas in Ireland. The most recent County Health Profiles published are from 2023[58] (Lenus, 2023) and have been used to establish a community health profile for the County Leitrim area in which the proposed project is situated. Leitrim is within the Public Health Area F West and Northwest. Area F's mortality rates are improving but inequalities remain arising from socioeconomic status. Irish Travellers, Roma, migrants and homeless people along with others experiencing

[56] https://biggareconomics.co.uk/wp-content/uploads/2020/01/Wind-farms-and-tourism-trends-in-Scotland.pdf (Accessed March 2025)

[57] https://biggareconomics.co.uk/wp-content/uploads/2021/11/BiGGAR-Economics-Wind-Farms-and-Tourism-2021.pdf (Accessed March 2025)

[58] https://www.lenus.ie/server/api/core/bitstreams/1c6fb46c-06f3-4eaf-b995-3d1b191a3c42/content Website reviewed October 2025

social exclusion are experiencing associated health impacts. In line with national trends, people living in area F are living longer and in better health, 87% of the Area F population reported good or very good health with 2% reporting bad or very bad health which is in line with national trends. 20% of suicides nationally in 2021 were recorded in Area F while representing 14.7% of the national population, the area experiences an above average rate of suicide.

A review of latest deprivation indices (2022) available from Pobal which ranges from 'very affluent' to 'extremely disadvantaged', shows that County Leitrim is considered Marginally Below Average while Manorhamilton as an ED (2019 boundary) is marginally above average. The levels of deprivation according to the Pobal HP Deprivation Index[59] from 2022 indicate that the EDs of Manorhamilton, Kiltyclogher and Munakil are marginally below average, disadvantaged, and marginally below average respectively. Leitrim on a county wide basis is marginally below average in 2022 which is consistent with the 2016 findings. Within the study area, the EDs generally align with county wide statistics. Munakil is the only ED in the wind farm site area which changed deprivation category from 2016-2022, dropping from marginally above average to marginally below average over the 6-year period.[60]

As outlined previously, it is not possible or necessary to identify every vulnerable individual. However, every human community contains vulnerable individuals; be those the old, the very young or because they have conditions which may make them more susceptible. Examples are as diverse as humans themselves but can include asthma, autism, and those with psychological illness. It is important to note that Health Standards are set for the vulnerable and not for the robust.

#### *4.3.3.1 Census 2022*

The key health statistics in the 2022 Census relating to County Leitrim are listed below:

Leitrim has a low level of diversity in the population with 90% of the county's population being Irish citizens and only 10% being non-Irish citizens; In the 2022 Census it was recoded that over 7,900 people (22% of the Leitrim's population) reported experiencing at least one long-lasting medical condition or difficulty to any extent. Of the 7,900 people, 2,995 people or 8% of the county's population reported experiencing at least one long-lasting condition or difficulty to a great extent or a lot. 4,910 people or 14% of the county's population self-reported experiencing at least one long-lasting condition or difficulty to some extent or a little.

When compared to figures on national level, it was recorded that 1.1 million people nationally (22%) reported experiencing at least one long-lasting condition or difficulty to any extent, of whom 407,342 (8%) experienced a long-lasting condition or difficulty to a great extent and 702,215 (14%) to some extent. County Leitrim's figures are in line with national averages. Nationally, more females (22%) than males (21%) experienced a long-lasting condition or difficulty to any extent. Leitrim is slightly above the national rate for both genders, where this rate was 23% for females and 22% for males.

Leitrim aligned with national averages again with regards to general health in the 2022 Census, 83% of Leitrim people reported their health as good or very good. In Leitrim this was a decline from 86% in 2016, nationally there was also a decline from 87%. 52% of males and 52% of

[59] Pobal HP Deprivation Indices Website reviewed October 2025
[60] Pobal HP Deprivation Indices Website reviewed October 2025

females reported very good health in Leitrim. There was an increase in those who reported bad health or very bad health with figures rising from 520 in 2016 to 660 in 2022.

Rates of mortality for all causes and for the main causes of death are slightly above average. Manorhamilton 805.7 per 100,000 of population, Leitrim had 7.8 per 1000 which equates to 780 per 100,000, national is 6.9 per 1000. Rural areas often reside an older section of the population with urban areas housing greater amounts of the younger sections of society. [61]

#### *4.3.3.2 Irish Health surveys*

A number of sources were reviewed to understand the current baseline and context in terms of general health in Ireland. The following sections provide a summary of the most recent health surveys and census data gathered and published by the Government and the CSO.

##### 4.3.3.2.1 CSO Irish Health Survey 2019/20

In 2020, the Central Statistics Office (CSO) published it's second "Irish Health Survey"[62], the data for which was collected in 2019 and early 2020. The first survey was collected for reference year 2015. This publication is part of an EU wide health survey and as other EU countries report on their data, it will be possible to compare how the Irish health experience compares to that of our EU neighbours. Some key findings of the survey included:

- *"Affluent people are more likely to feel their health status is Very good or good than people who are disadvantaged - 92% of Very affluent persons compared to 78% of persons who are Very disadvantaged;*
- *Over a quarter of persons aged 15 years and over report having a long lasting condition, with older persons reporting higher levels;*
- *Majority of persons (82%) report no limitations in everyday activities due to a health problem;*
- *Over a fifth (21%) of Unemployed persons report some form of mental ill-health compared to 9% of those In employment;*
- *Prevalence of hospital in-patient admissions rises with age and disadvantage level;*
- *In general, females and older people more likely to use a preventive health service;*
- *Physical activity declines with age and relative disadvantage level;*
- *Younger persons more likely to drink 6 or more units of alcohol in one sitting; and*
- *Over half of persons aged 15 years and over in the State are overweight or obese"* (CSO 2020).

#### *4.3.3.3 Environmental Factors*

##### 4.3.3.3.1 Air

The existing environment surrounding the proposed project currently has a high standard in relation to air quality and current levels of key pollutants are significantly lower than their

[61] Deaths 2022 Vital Statistics Annual Report 2022 - Central Statistics Office Website reviewed October 2025
[62] https://www.cso.ie/en/releasesandpublications/ep/p-ihsmr/irishhealthsurvey2019-mainresults/introductionandkeyfindings/ (Website reviewed October 2025

respective limit values (as per latest EPA Air Quality Monitoring Network and annual air quality reporting data). Refer to Chapter 12 (Air Quality) for further details.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones (A, B, C and D)[63] have been defined in Ireland for air quality management and assessment purposes (EPA, 2022). In terms of air monitoring, the proposed project is located within Zone D (Rural Ireland). The most recent monitoring carried out by the EPA is summarised in their annual report "Air Quality Monitoring Report 2024" published in September 2025[64].

Overall, air quality in the area of the Proposed Project is considered good based off data reviewed and presented in Chapter 11 Air Quality. Results for Particulate Matter ($PM_{10}$ and $PM_{2.5}$) were all below the respective annual mean limit values for the protection of human health, in particular at the rural locations, the data from which is likely to be broadly representative of the typical background concentrations at the rural location of the Proposed Project.

#### 4.3.3.3.2 Water

Chapter 8 - Hydrology and Hydrogeology outlines the baseline environment in terms of the water environment. The Proposed Project is located on the boundary of the Sligo Bay and Drowse (ID: 35) WFD Catchment and the Erne (ID: 36) WFD Catchment. There are several surface waterbodies which flow within or around the proposed wind farm site, as outlined in Section 8.3 of Chapter 8, along the proposed GCR or adjacent to proposed TDR work areas.

In terms of surface water quality, based on the data presented in Chapter 8, the overall water quality in the area surrounding the proposed wind farm site, is 'moderate' to 'good' status, with occasions of 'high' status. However, as outlined in Table 8-10, regular monitoring did not occur in the Owenmore (Manorhamilton)_020 or Ballagh_010 WFD River Sub-Basin, with monitoring ceasing in 1990.

Based on GSI data there are no surface water abstractions located within the footprint of the proposed wind farm site or within a 2 km radius of its boundaries. One EPA registered groundwater abstraction occurs at Kerrigan quarries, located 0.5 km to the south of the Owenmore (Manorhamilton) river.

Table 8-17 of Chapter 8 details that the GroundWater Body Groundwater Quality status within the proposed wind Farm status is good. Based on the Geological Survey of Ireland (GSI) data there are no Group Water Schemes (GWS) or Public Water Supplies (PWS) located within 2 km of the proposed wind farm site.

The hydrogeological quality is of medium sensitivity due to the limited groundwater abstraction on the proposed wind farm site, GCR and accommodation areas along the proposed TDR, and neither element are located in a groundwater source protection zone. There are no public water

[63] The main areas defined in each zone are: Zone A: Dublin; Zone B: Cork; Zone C: Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise; and Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

[64] https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2023.php (Accessed March 2025)

supplies within 0.7 km of the GCR or accommodation areas along the proposed TDR. There are no groundwater abstractions within 0.5 km from the borrow pits or turbine locations.

#### 4.3.3.3.3 Noise

Chapter 9 - Noise and Vibration outlines the baseline environment in terms of noise in the area of the proposed wind farm. The study area for the noise and vibration impact assessment is focused on the areas potentially to be affected by the construction, operational and decommissioning phases of the proposed project.

Background noise levels are measured in the vicinity of Noise Sensitive Locations (NSLs) identified in closest proximity to the proposed wind farm site, as presented in Chapter 9 (Noise and Vibration). Locations were selected to represent the noise environment at the nearest NSLs and to determine the baseline noise levels.

A summary of derived background noise level is available in section 9.5.1 of Chapter 9.

#### 4.3.3.3.4 Land and Soils

An evaluation was carried out to assess the presence and extent of potentially contaminated land or sites within the study area, using data from the Environmental Protection Agency (EPA), including historical records and the Section 22 Register of the Waste Management Act 1996 held by Local Authorities. This assessment was based on the identification of potential sources, pathways, and receptors, presented in Chapter 7 -Land, Soils and Geology. A review of the EPA's database of existing and historical licensed and unlicensed waste activities, mining operations, and industrial sites revealed no evidence of potential contamination sources or contaminating activities within the proposed wind farm site.

No contaminated soils were encountered during site investigations (SI) undertaken as part of studies for this EIAR at the proposed wind farm site. Details of site investigations undertaken and associated soil laboratory results are discussed within Chapter 7 - Land, Soils and Geology and associated appendices.

#### 4.3.3.3.5 Traffic

Transport and access play an important social role in urban and rural communities, linking rural areas with settlements and essential services, such as schools and healthcare facilities. Chapter 16 - Traffic and Transportation provides a detailed description in terms of local access, the wider road network, and the road network surrounding the proposed wind farm site. Local roads to be used to access the proposed wind farm site include the L6184, L61844 and the L61801.

Public transportation is not readily available in the wider area around the proposed wind farm site. The nearest trains are available from Sligo (MacDiarmada Station), located on the Dublin Connolly to Sligo line. Busses are available along the N16 from Manorhamilton to Enniskillen. The N16 is the nearest national road providing access to the area (via the L6184 and R283) around the proposed wind farm site.

Health impacts may be experienced by individual receptors using the local road network due to traffic impacts which may cause nuisance, delays and disruption to routes and access, leading to individual receptors experiencing feelings of anxiety, worry, frustration or irritation caused by such traffic disruption.

#### *4.3.3.4 Wind Turbine Health Effects*

'Wind Turbine Syndrome' originated from a 2009 pamphlet by Dr. Nina Pierpont, which claimed wind turbines cause various health problems, though it was not peer-reviewed and is considered unscientific. A 2011 review by Knopper and Ollson found that while annoyance is associated with turbine noise, it relates more strongly to visual impact and attitudes toward turbines; no peer-reviewed evidence shows a causal link between turbine proximity and physiological health effects (Knopper and Ollson, 2011). Their 2014 study further suggested that nocebo[65] effects, health symptoms triggered by negative expectations may explain many reported complaints, concluding that properly sited turbines are not linked to adverse health effects (Knopper et al., 2014).

Studies and reviews from Australia's National Health and Medical Research Council (NHMRC) (NHMRC, 2010, Merlin et al., 2015) found no direct health pacts arising from wind turbines. Professor Simon Chapman surmised that if wind turbines did cause medical problems, we would expect to find a relationship between prevalence of the syndrome and populations living near wind farms, which is not supported by data (Chapman., 2012). Further studies from Chapman in 2015, and further review published in 2017 support the 2012 findings that no causal health effects are supported by data (Chapman., 2015, 2017).

More recent studies further support these conclusions. A 2021 review (van Kamp & van den Berg) found that annoyance may increase with turbine sound levels but found no consistent evidence of impacts on sleep, cardiovascular health, or cognition. Involvement in turbine siting reduces annoyance. A UK based study (Qu & Tsuchiya, 2021) showed that awareness of research aims inflated self-reported symptoms, highlighting the importance of rigorous scientific methods.

##### 4.3.3.4.1 Wind Turbine Noise, Infrasound and Amplitude Modulation

Based on the available literature regarding windfarm developments and noise and infrasound disturbance, there remains uncertainty in the evidence suggesting a direct correlation between windfarm related noise and disturbance to human health or quality of life. The available publications and studies outline that there appears to be little scientific evidence of effects of *Wind Turbine Syndrome*, and wind farms are not a significant source of noise and infrasound. Further discussion on noise and infrasound is presented in Chapter 9 - Noise and Vibration.

In the context of the assessment of operational noise from wind turbines, amplitude modulation (AM) is defined in the IOA AMWG document as:

*"Periodic fluctuations in the level of audible noise from a wind turbine (or wind turbines), the frequency of the fluctuations being related to the blade passing frequency (BPF) of the turbine rotor(s)."*

It is critical in the discussion of amplitude modulation (AM) to recognise that it is an inherent characteristic of wind turbine noise. A distinction must be made between 'Normal' AM, which is a regular fluctuation in noise levels, and 'Other' or 'Excessive' AM, which can be more pronounced and potentially disruptive, details on this distinction are outlined in Section 9.3.4.7.

[65] Nocebo is defined as "*A non-existent or inactive substance or factor that causes symptoms of disease in people who believe that they have been exposed to it*" (Source: Collins English Dictionary: Accessed October 2024).

#### 4.3.3.4.2 Electromagnetic Interference

When electric current flows, both electric and magnetic fields are produced. The electromagnetic fields (EMF) from electricity are in the extremely low frequency end of the electro-magnetic spectrum. EMF occurs in the home, in the workplace or anywhere that electricity is used. EMF is also naturally generated from earth's geomagnetic field and electric fields from storm clouds.

Guidance from the WHO states that EMF is sometimes cited for potential health effects (WHO, 2007). Laboratory experiments have provided no reliable evidence that EMF are capable of producing cancer, nor do human epidemiological studies suggest that they cause cancer in general. Furthermore, the Health Promotion Agency in the UK stated, in November 2007, that *"there is little scientific evidence to support these claims and the current body of evidence does not show that exposure to EMF below guideline levels presents a human health hazard"*.

The aforementioned Australian NHMRC study (Merlin et al., 2015) concluded in relation to EMF that *"There is no direct evidence on whether there is an association between electromagnetic radiation produced by wind farms and health outcomes."* EirGrid have produced a number of publications on EMF and health, most recently "*The Electricity Grid and Your Health"* (May 2019) which states that *"the consensus from health and regulatory authorities is that extremely low frequency EMFs do not present a health risk"*. Information on EMF currently provided by EirGrid[66] states that *"the most common concern about EMFs from power lines is a fear that magnetic fields could be associated with childhood leukaemia"*, however, *"recent studies conducted in the UK, France, Denmark and the US have not established associations between a home near transmission lines and childhood leukaemia"* and *"Based on this history and its own review of research, the World Health Organization states there is no evidence to conclude that exposure to low-level EMFs is harmful to human health"* (EirGrid, 2024).

#### 4.3.3.4.3 Shadow Flicker

'Shadow flicker' is an effect that occurs when the rotating blades of a wind turbine cast a moving shadow over an observer or a building. Modelling can be used to predict the strength and duration of potential shadow flicker during daylight hours for every day of the year (DHLGH, 2019). A Shadow Flicker Study detailing the outcome of modelling for the potential for shadow flicker from the proposed wind farm has been undertaken. Further discussion on the modelling outcomes and assessment of Shadow Flicker effects is presented in Chapter 10 - Shadow Flicker.

#### 4.3.3.4.4 Psychological Effects

The potential for adverse effects on psychological health, such as anxiety and stress, caused by concern in relation to visual appearance, noise emissions, shadow flicker and other issues, is often highlighted in relation to wind farms. The potential effects on a person's overall psychological well-being is difficult to assess as there are no direct measurements that can be used. The 2014 study by Health Canada on the effects of wind turbine noise on health and well-being (Health Canada, 2014), looked at a number of measures of stress and noted no association with exposure to wind turbine noise.

[66] https://www.eirgrid.ie/emfs Website reviewed October 2025

The potential degree of psychological impact can be both positive and negative. There can be a positive impact, whereby people may look forward to better employment opportunities generated by a major infrastructure development in a rural area or the benefits that may be gained from the Community Benefit Funds. In terms of negative impacts, this can be where somebody is annoyed by for example, the visual appearance of the wind turbines. This annoyance is not a medical health impact, as such. In this case, it is useful to look at experience from other operational wind farms to determine if significant psychological effects are reported and published. If this was the case, it would be expected to find recorded evidence of increased levels of depression or anxiety in the vicinity of other wind farms, however, definitive findings on such were not evident in the peer-reviewed aforementioned 2014 Health Canada report referenced above.

## 4.4 ASSESSMENT OF EFFECTS

### 4.4.1 Future Baseline Scenario

**Proposed Wind Farm**

In the Likely Evolution of the (Future) Baseline Scenario, the existing lands will continue to be utilised for agricultural and forestry purposes with little or no changes in the baseline at the site. Agricultural activities and periodic tree felling will continue with the movement of equipment and personnel associated with same.

The opportunities for local employment and additional economical spend from the proposed project will not be realised. In the Likely Evolution of the Baseline, there will be no emissions generated from construction works and no potential for noise, shadow flicker or visual effects associated with wind turbines at this site.

The health benefits to the country associated with replacing fossil fuels with renewable wind energy from the proposed project will be lost and alternative candidate sites will need to be identified, either onshore or offshore, to ensure Ireland meets it commitments to reducing carbon emissions.

**Proposed GCR and TDR Accommodation Areas**

The proposed accommodation areas along the TDR and the GCR would be likely to remain as they currently are, with no effects anticipated.

### 4.4.2 Population

#### *4.4.2.1 Construction Phase*

##### 4.4.2.1.1 Land Use

**Proposed Wind Farm**

The construction of the Proposed Project will involve permanent land use change primarily for the excavation of borrow pits and the construction of access roads, turbine hardstandings, site compounds and substation over a 24-period.

The construction itself may have short term slight negative effect on the forestry operations within the site, as access to the site for forestry operations is likely to be restricted to only essential works. Significant felling in particular will be postponed for the 24 month construction

period. There will also be a short-term, negative effect due to the forestry felled for the construction compounds, which will be returned to forestry use on completion of the construction works. The access roads will remain in place which will have a permanent positive effect on forestry land-use, improving access to the commercial crop while the hardstandings will be allowed to revegetate naturally after the operational phase. Necessary forestry and agricultural activity will be able to continue on the wider proposed wind farm site during the construction phase.

For the proposed GCR, the use of the road corridors by traffic will be maintained through the operational phase and will only briefly be impacted during the construction phase as the accommodation areas are of temporary duration.

**Proposed GCR and TDR Accommodation Areas**

The proposed GCR will require trenching and cabling along 30.6 km of public roads which will be undertaken in phases (refer to Appendix 2-3 Substation and Grid Connection Construction Methodology). Approximately 1.4 km will be installed in within third party lands, primarily where the cable encounters bridge crossings and off-road Horizontal Directional Drilling undercrossing is required.

The construction of the proposed GCR and TDR accommodation areas will not have a significant effect on the use of the roads for transportation. Some temporary localised diversions and traffic management will be utilised where required. This will have a temporary slight negative effect.

There will be changes to the land use of the farmland and forestry being utilised for the proposed GCR, as those lands will then be used to accommodate electrical infrastructure. Agricultural lands will return to existing land use post GCR works. Areas of forestry will not return to their existing land use as cable areas are to remain unplanted by trees. This will have a permanent slight neutral effect.

Overall, it is not anticipated that the proposed project will have a significant effect on land use. Any likely effects on population receptors in terms of land use are therefore predicted to be neutral, imperceptible and short-term.

#### 4.4.2.1.2 Population Trends

**Proposed Wind Farm**

A report by Pöyry in 2014 (*Value of Wind Energy to Ireland*) identified that the wind energy sector could support 12,390 (person-years) direct jobs during construction to deliver on Ireland's 2020 renewable target (as it was at the time when the report was published). The effect of these jobs is likely to be a short-term increase in construction workers staying in local accommodation in the area over the period of c. 24 months which will add value to the local economy. This will be a positive direct short term effect as a result of the Proposed Project being constructed.

The construction phase of the proposed wind farm will have a likely significant impact on local or wider population trends, such as population levels, density, age or household size. Any likely significant effects on population trends in the area will be direct, neutral to positive, and short-term as a result of the arrival of construction workers to the proposed project area.

#### 4.4.2.1.3 Property/Receptors

**Proposed Wind Farm**

Access to the proposed wind farm site will be via the site entrances at the L6184 and the L61801. The potential traffic impacts are discussed in detail in Chapter 16 (Traffic and Transportation).

Potential negative effects on local property receptors (including residential, educational, and commercial properties) as a result of the construction works can arise from construction activity at the wind farm site, as well as on the local road network, such as from increased traffic movements associated with vehicles accessing the wind farm site resulting in potential increases in emissions locally (e.g., noise, vibration and emissions to air (including dust)). This may also have potential to impact on local residents' enjoyment of their homes, i.e., residential amenity. Residential amenity relates to the human experience of a person's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is influenced by a combination of factors, including site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced at the residence.

The design of the proposed wind farm site has included a minimum set-back distance of 740m from the curtilage of the nearest residential receptor to the proposed turbine locations which will reduce the potential for the wind turbine infrastructure to have a significant effect on residential amenity. The closest borrow pit location is c. 550 m from a residential property and access road works will take place at a minimum distance of c. 25 0m from the nearest residential building. These effects are assessed in detail in Chapter 9 - Noise and Vibration, Chapter 11 -Air Quality and Chapter 12 - Climate.

The haul routes proposed are existing public roads which are already used by heavy goods vehicles (HGVs). There will be a short-term increase in traffic volumes during the construction phase due to increased vehicle trips in the vicinity and on-site construction activity (see Section 16.5 of Chapter 16).

It is also noted that the properties located along the L6184 and the L61801 which will experience an increase in construction traffic movements are located a considerable distance from the nearest turbine installation construction works (in excess of 900m). Upgrade works at the site entrance on the L6184 are located c. 25 m from the closest residential building. No upgrade works are proposed for access road L61801 but the closest residential building is 614 m.

The construction phase will likely have a slight, negative effect on the local property receptors and will be short-term in nature.

Overall, based on the predicted effects outlined above (inc. dust, noise, road traffic etc.), and given the distance between sensitive property receptors and the proposed wind farm site, significant impact on sensitive property receptors and residential amenity associated with the construction phase of the proposed wind farm are unlikely. Any likely effects on property receptors / residential amenity in the area will be direct, negative, slight, and short-term

**Proposed GCR and TDR Accommodation Areas**

There will be some additional accommodations required off site to facilitate the proposed turbine delivery (see Chapter 2 (Description of the Proposed Project)). Furthermore, the accommodation areas are small scale and transient in nature and mostly constitute temporary accommodation areas along the public road. They may result in temporary localised noise and dust emissions, and there may also be some traffic management implications for road users. These effects are assessed in detail in the Chapter 11 (Air Quality), Chapter 9 (Noise and Vibration), Chapter 13 (Landscape and Visual Impact Assessment) and Chapter 16 (Traffic and Transport).

Although the proposed GCR and proposed TDR accommodation areas will be located near sensitive receptors, they will be similar to any other normal road works that might be carried out. Significant effects on property receptors and residential amenity associated with these accommodation areas are unlikely. Effects on property receptors in the area of these proposed accommodation areas will be direct, negative, temporary and not significant.

#### 4.4.2.1.4 Property Value

**Proposed Wind Farm**

It is not anticipated that the proposed project will have a likely significant effect on the local property values. A major UK study entitled *The Effect of Wind Farms on House Prices* carried out in March 2014, discussed in more detail in Section 5.4.1.2, noted that *"The econometric analysis established that construction of wind farms at the sites examined across England and Wales has not had a detectable negative impact on house price growth within a 5km radius of the sites"*. Furthermore, the 2023 CERIS working paper entitled *'Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach'* found that there are *"no significant reduction in house price beyond 1 km for all specifications"* and the results indicate that the effects on house value is not persistent and diminishes over time.

Construction works for the wind farm will be carried out within the site boundary and construction traffic travelling to the site will predominantly use existing public roads. Based on the available published studies discussed in this chapter and due to the short term nature of the construction works for the proposed project there is no anticipated likely significant effect on local property value as a result of the construction phase of the proposed wind farm.

Based on the above, there are no anticipated effects on property value in the area due to the construction phase of the proposed project.

**Proposed GCR and TDR Accommodation Areas**

The proposed GCR from the site will be underground and will be located within public roads, Coillte lands and other third-party land. Accommodation areas associated with the proposed GCR, and the proposed TDR accommodation areas will be localised, relatively minor and temporary. There would be no additional effects specifically from the TDR and GCR relating to property value.

#### 4.4.2.1.5 Employment/Economy

**Proposed Wind Farm**

The proposed wind farm will create and support direct and indirect employment during the construction phase at local level, primarily through local construction workforce on site, and at a national level, through more specialised construction services and supply of building materials. It is anticipated that the wind farm will have the following effects locally:

- Development activities such as site monitoring/surveys, site investigations, legal fees, consultancy studies during pre-construction and construction works, etc.;
- Spending locally by construction employees; and
- Accommodation and sustenance will be required in the locality for those workers on site.

Guidance from a 2009 IWEA study[67] states "*Our analysis has shown that the wind energy sector in Ireland can support 1.50 jobs per MW to be installed on the island*". Based on the proposed project capacity of between approx. 100MW, this equates to approximately 150 jobs across several different sectors. The study (from 2009) estimated that 68% of the Irish jobs created are in the construction industry. It is estimated that up to 100 persons will be directly employed during the peak construction period.

The area will experience a benefit from secondary investment associated with increased visitors and spend within the area. An ESRI report entitled *An Enterprising Wind: An Economic Analysis of the Job Creation Potential of the Wind Sector in Ireland* (2014) estimates the level of indirect job creation to be between 0.15 and 0.55 jobs per direct job created. Construction materials such as quarried products and concrete supplies can be sourced locally and will support local business. Throughout the construction phase, there is potential that plant, equipment and associated operatives can be sourced locally. Indirect employment opportunities will be created in the region through increased quarrying activity and off-site concrete batching as well as potential increased employment in the local hospitality and café/restaurant industries driven by use of the facilities by construction staff.

The *Value of Wind Energy to Ireland* (Pöyry, 2014) report states that *"the wind industry would make a valuable contribution to the Irish economy by meeting the 2020 renewable target and provide a good platform for continued growth during the 2020s compounding the benefit to the economy"*. It also states that wind farm developments in Ireland, such as the proposed project, have the combined potential to support 12,390 jobs (person-years) during construction to deliver the 2020 renewable target and a further 10,120 jobs (person-years) would be supported during construction through to 2030.

The proposed project will support the renewable energy supply and the green economy and also make a valuable contribution to Leitrim County Council's economic vision "through the provision of sustainable employment and business opportunity in the traditional and emerging knowledge-orientated sectors"[68]. The construction of the proposed project/wind farm will have

[67] IWEA and Deloitte, *Jobs and Investment in Irish Wind Energy: Powering Ireland's Economy* (2009) Website reviewed October 2025

[68] https://www.leitrim.ie/council/services/planning-building/forward-planning-development/leitrim-county-development-plan/volume-i-written-statement-lcdp-23-29.pdf Website reviewed October 2025

an estimated capital cost in the region of €130 million[69] and an estimated 15 -20% of the total capital cost will relate to site works[70] which have the potential to support local contractors and suppliers. The *Life-cycle of an Onshore Wind Farm* published by IWEA in March 2019 stated that *"One recent 169MW windfarm project estimated that €20 million was spent with local suppliers and contractors within 30 kilometres of the site during construction"*.

Therefore, it is predicted that the construction phase of the proposed project is likely to have direct and indirect positive, slight to moderate, short-term effects on employment and economy in the local area, wider county and the Border Region.

**Proposed GCR and TDR Accommodation Areas**

The accommodation areas for the TDR and GCR would result in a short term slight positive effect on employment and economy as a result of the increased local spend (for wages and material supply).

#### 4.4.2.1.6 Tourism

**Proposed Wind Farm**

As set out in Section 4.3, there are several popular tourism attractions and public amenities in County Leitrim. Adjacent to Manorhamilton and closer to the study area there are several cycling and walking tracks and loops. However, the proposed works are not envisaged to directly interact with such amenities and attractions. The nearest visitor site identified is approximately 4 km away in Manorhamilton village. The closest trails/walks identified to the proposed wind farm site are approximately 4.5 km from the proposed wind farm site. None of the five most visited tourist sites (referenced in Section 4.2.3.6) in Leitrim are within 5 km of the proposed wind farm site.

No existing designated tourist sites or walkways/trails were identified as intersecting with or within the wind farm application boundary.

Intermittent and temporary traffic effects due to movement of vehicles, as well as plant and machinery, related to the proposed project, and the requirement for abnormal loads related to the delivery of the turbines to site may impact local road traffic during the construction phase due to the increased road traffic movements. Abnormal loads will occur at set times at night time and along designated routes (see Section 16.5.4 of Traffic and Transportation). Although there is potential for effects to road users as a result of road use for abnormal loads, as they are to occur on off peak hours and for a brief time it is not considered to have an impact on tourist related traffic.

It is considered that the construction works will only have a slight temporary impact on the tourism facilities within the county. There is relative distance between the proposed wind farm site and tourism sites within Leitrim.

[69] Using an average investment cost of €1.3 million per MW – SEAI, *A Macroeconomic Analysis of Onshore Wind Development to 2020* (2015) Website reviewed October 2025

[70] Irish Wind Farmers Association - FAQ | Meitheal na Gaoithe Irish Wind Farmers Association (mnag.ie) Website reviewed October 2025

Measures to be employed by the appointed Contractor during the construction works to ensure the health and safety of tourists and the general public are outlined in the Construction Environmental Management Plan (CEMP) in Appendix 2-4.

No other direct effects on tourism activity are anticipated during the construction phase. Therefore, due to the increased traffic movement the construction phase is likely to have an indirect, neutral to negative, not significant, short-term effect on local tourism.

**Proposed GCR and TDR Accommodation Areas**

There will be no additional effects specifically from the TDR and GCR relating to tourism and recreation.

#### *4.4.2.2 Operational Phase*

##### 4.4.2.2.1 Land Use

**Proposed Wind Farm**

The proposed wind farm will involve permanent works on the existing land primarily including turbine foundations, hardstand areas at turbines, internal roads and an on-site substation. The total site area of the proposed development is 389 ha of which 170.5 ha is the proposed windfarm. The forestry land use within the infrastructure area will be permanently lost (with the exception of the temporary construction compound areas and borrow pits which will be replanted post construction and therefore will be a temporary loss), however replacement forestry lands will be planted elsewhere in the state. There will be a wind farm located on the site which will create a long term commercial land use within the site, producing clean renewable energy which will have a long-term moderate positive effect on land use. At the end of the operational phase, the wind turbines will be removed and the land use will revert back to agriculture or unused land (unless further consent is obtained for the land such as planting forestry or repowering the wind farm, see Chapter 2 - Description of the Proposed Project for further details on decommissioning).

There will be no other anticipated effect on land use outside the proposed wind farm site.

Overall, the proposed wind farm will have no significant negative effects, and some positive effects on the existing land use at the site during the operational phase. It will result in a slight long term positive effect.

**Proposed GCR and TDR Accommodation Areas**

There will be an additional land use of electricity transmission along the GCR, resulting in a not significant permanent neutral effect on land use. There will be no additional effects specifically from the TDR relating to land use and population.

##### 4.4.2.2.2 Population Trends

**Proposed Wind Farm**

It is anticipated that the proposed project will not have a significant effect on the current population trend in County Leitrim or locally. The improved facilities supported by the Community Benefit Fund, could make the local area attractive for people to move to. The Community Benefit Fund proposed in line with industry best practice, is in accordance with the

terms and conditions of the Government's Renewable Electricity Support Scheme (RESS). (further details of the proposal are provided in Section 2.16 of this EIAR).

Operational phase effects in terms of population trends are therefore likely to be neutral, not significant to slight, and long-term.

**Proposed GCR and TDR Accommodation Areas**

There will be no additional effects specifically from the GCR relating to population.

#### 4.4.2.2.3 Property/Receptors

**Proposed Wind Farm**

The locations of the proposed turbines have been carefully designed with cognisance of the local population and receptor locations. In accordance with the 2006 WEDGs, there are no turbines located within 500m of a residential property. Extensive consideration has been given to the layout of the site and the positions of the turbines in ensuring sufficient set-back distances from sensitive receptors and adjustment for noise, shadow flicker, visual impact and telecommunication impacts.

The Draft 2019 WEDGs recommend a minimum setback distance of four times the tip height (185m x 4 = 740m) from a proposed turbine to the curtilage of any residential property. The proposed project complies and exceeds with this recommendation by establishing a minimum 740m setback, with the closest sensitive receptor at over 760 m.

These considerations during the design, planning and EIA phase, in accordance with the relevant guidelines, are designed to minimise the potential effects on property receptors and residential amenity from the proposed wind farm.

There will be a potential for low levels of additional traffic on local roads (i.e., for site maintenance).

As mentioned, a Lissinagroagh Wind Farm Community Benefit Fund will be established in accordance with the terms and conditions of the Government's RESS. The Community Benefit Fund will be positive for those residing in the local area. Those living in closest proximity should be priority beneficiaries and as such some of the fund is designated for 'Near Neighbour' payments. However, broader community benefits apply as well. A Community Benefit Fund worth €2/MWh (megawatt hour) of generated electricity for the operational period has been pledged by the applicant. The potential effects on human beings at their residences during the operational phase are assessed in the following chapters: Chapter 11 - Air Quality, Chapter 9 - Noise and Vibration, Chapter 13 - Landscape and Visual and Chapter 16 - Traffic and Transportation.

Impacts in terms of environmental factors and human health are discussed in Section 4.4.3.

Significant effects on local property receptors and residential amenity during the operational phase is unlikely. Any likely effects in terms of property receptors and residential amenity during the operational phase are therefore considered to be negative, slight, and long-term.

**Proposed GCR and TDR Accommodation Areas**

There will be no additional effects from the proposed GCR or TDR accommodation areas relating to sensitive receptors and residential amenity during the operational phase as the

turbines will have been commissioned and the GCR accommodation works will have been completed during the construction phase.

#### 4.4.2.2.4 Property Value

**Proposed Wind Farm**

Based on the literature reviewed, it is not anticipated that the operation of the proposed wind farm will have significant effect on local property values.

A major UK study entitled *"The Effect of Wind Farms on House Prices"* carried out in March 2014, discussed in more detail in Section 4.3.2.4, noted that wind farms across England and Wales did not have a detectable negative impact on house prices within 5kmFurthermore, the 2023 CERIS working paper entitled *'Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach'* found that there are *"no significant reduction in house price beyond 1 km for all specifications"* and the results indicate that the effects on house value are not persistent and diminish over time.

Therefore, based on the available published studies presented in this chapter, it is reasonable to conclude that significant effects on property value in the area due to the operation of the proposed wind farm are unlikely. Any effect on property value in the area would likely be direct, negative, slight, and short to medium-term.

**Proposed GCR**

There will be no additional effects specifically from the GCR relating to property values.

#### 4.4.2.2.5 Employment/Economy

**Proposed Wind Farm**

It is anticipated that there will be ongoing local employment on the site throughout the operational phase of the proposed wind farm relating to turbine servicing/maintenance, breakdowns/faults, inspections, and substation maintenance, as well as maintaining the internal access roads, drainage, and other ongoing site work. Once operational, it is estimated that the wind farm will support 28-36 jobs in operation and maintenance (based on 0.36 jobs per MW[71]).

Although only a small proportion of these jobs are likely to be directly based in the wind farm site, it is likely that the operational phase will support indirect jobs, such as suppliers, consultants, research institutions and universities, financial services, energy sector roles, and hospitality and service industry roles, and benefit the wider employment profile.

Furthermore, there may occasionally be a requirement for additional people to visit site if a particular task requires it. Some local employment or contract opportunities may develop over the lifetime of the wind farm from occasional specific requirements.

Economic benefits from operational activities will include ongoing purchases of local materials, services and equipment required for the operational phase of the wind farm as well as local spend generated from technical operational staff. The wind farm is expected to support 2-3 high

71https://opus.lib.uts.edu.au/bitstream/10453/43718/1/Rutovitzetal2015Calculatingglobalenergysectorjobsmethodology.pdf

quality technical full-time jobs in operation and maintenance as well as a number of jobs in ancillary functions. Some local employment or contract opportunities may develop over the lifetime of the wind farm from occasional less specialised activities.

The impact of the Community Benefit Fund is likely to enhance the local economy, with potential for substantial funding for local projects in support of relevant UN Sustainable Development Goals (SDGs), clubs, charities and near neighbours, which will be invested in the local area.

In addition, the proposed wind farm will require payment of rates to Leitrim County Council which will provide additional revenue for their work around the county.

The impact of the community benefit scheme is likely to enhance the local economy, with potential for substantial funding for local projects in support of relevant UN Sustainable Development Goals, clubs, charities and near neighbours, which will be invested in the local area. The Renewable Energy Support Scheme also proposes a community investment opportunity although this was not realised in the first RESS scheme.

Positive economic effects will also be felt in the wider area due to the ongoing benefits of renewable electricity generation. The energy generated will feed directly into the national electricity transmission system, providing a sustainable electricity source and an increasingly competitive, low impact, energy supply to the county's domestic and industrial consumers. This is a significant, positive long-term effect for electricity consumers.

Therefore, it is anticipated that the operational phase of the proposed wind farm is likely to have direct and indirect positive, slight to moderate, long-term effects on employment and economy in the local area, County, the border Region, and nationally.

**Proposed GCR**

There will be no additional effects specifically from the GCR relating to employment and economy.

#### 4.4.2.2.6 Tourism

**Proposed Wind Farm**

The Fáilte Ireland Guidelines (July 2023) state that *"The impact upon tourism can be considered within this section through the sensitivities of hospitality, safety and pace of life. Changes in population can impact the perception of pace of life or safety in a particular location"*. The Guidelines also note that *"Impacts upon these issues in areas which rely heavily on tourism or have a particular sensitive tourism generator should be considered in this section"*.

In 2007, a collaboration between Fáilte Ireland and the Northern Ireland Tourist Board surveyed tourists' perceptions in relation to wind farms in the Irish landscape. A follow up survey in 2012, *Visitor Attitudes on the Environment: Wind Farms – Update on 2007 Research'* provided more recent information for the tourism and energy sectors. The results were positive, with 80% of tourists considering the presence of wind farms to have no impact or a positive impact on their sightseeing. In addition, when asked if further wind farm development in Ireland would influence their decision to holiday in Ireland again, over 70% of responses cited no impact or a positive impact on their return to Ireland.

Similarly, a 2016 study carried out by BiGGAR Economics '*Wind Farms and Tourist Trends in Scotland*" examined the link, if any, between onshore wind energy development and the

sustainable tourism sector in Scotland. The report did not find a direct relationship between tourism and the wind energy sector in itself; however, it did conclude that the increase in wind farm development did not negatively impact employment in the sustainable tourism industry in Scotland.

As noted previously, there are public amenities in Manorhamilton however they do not interact significantly with the proposed wind farm site study area. The most visited tourist locations in Leitrim (Hag's Leap, Glencar Waterfall, Parkes Castle, Creevelea Friary and Drumshanbo) are in excess of 5 km away from the wind farm site.

The proposed wind farm will be visible from some features in both Ireland and Northern Ireland (as discussed in Chapter 13 - Landscape and Visual). Owing to the separation distance from the Northern Ireland border and the intervening landform, which heavily reduces both the perceived scale and spatial extent of the proposed project from receptors within Northern Ireland, the potential for transboundary landscape and visual effects is limited. Thus, transboundary effect are assessed as **Not Significant**

The proposed wind farm is not anticipated to have a significant impact on tourism and amenity in the local area or wider region. It is considered that it will likely have a neutral, slight, long-term effect on the tourism experience and numbers in the vicinity of the proposed wind farm site.

**Proposed GCR**

There would be no additional effects specifically from the GCR relating to tourism and recreation.

## 4.4.3 Human Health

This assessment of the potential impact of the proposed project on human health is based on a comprehensive review of the relevant published literature on the subject. In this regard, it is important to assess the quality of available information reviewed. In general, studies which are published in peer-reviewed journals are the most authoritative. Peer-reviewed means that only those with reasonable scientific substance which meets the scientific criteria of experts in the field are published. Even within peer-reviewed journals, there are different qualities of studies. Studies which are merely based on questionnaires or other reporting of symptoms are of less value but may be useful in identifying areas for further study, particularly if they are linked with scientific measurements. Occasionally, opinion is published, without necessarily strong back-up, to stimulate discussion.

Wind (and renewable) energy is a subject on which there is a lot of opinion available on the internet, with wide ranging and often contradictory information. The following sections provide a summary of some of the available material in relation to potential effects of wind turbines on human health and an analysis of its scientific robustness.

### *4.4.3.1 Construction Phase*

#### 4.4.3.1.1 Air Quality and Dust Emissions

**Proposed Wind Farm**

The construction of the turbine infrastructure and erection of the turbines will take place away from residential properties with at least 750m distance from the proposed turbines to all

properties. Dust is typically predictable in its dispersion and studies show that the majority of dust deposition occurs close to its creation. The nature of dust creation and deposition depends on the type of works, ground conditions and weather conditions.

Good construction practice and mitigation measures in terms of dust control will minimise any potential effects and are discussed in more detail in Chapter 11 (Air Quality) and the CEMP, Appendix 2-4. While in a construction project of this scale it is inevitable that there will be occasional dust generated, this is likely to be very localised in place and time. As detailed in Chapter 11, it is extremely unlikely that the construction activities will result in air quality standards being exceeded over any significant period of time in the environment outside of the construction site. It is therefore concluded that there will be no significant human health effects arising from emissions to air including dust generation.

By replacing fossil fuel burning power generation stations with clean renewable energy such as from the proposed project, there will be a positive overall impact on air quality in the country as a whole, and particularly in the regions where peat burning power stations are currently operational, as compared to a Do Nothing scenario (i.e. where the wind farm is not built).

There is at most a medium risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the proposed works. As a result, best practice dust mitigation measures associated with medium-risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be direct, short-term, negative and slight.

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the proposed wind farm site. The construction stage traffic has been reviewed, and a detailed air quality assessment has been scoped out. None of the road links impacted by the proposed project satisfy the Transport Infrastructure Ireland (TII) scoping assessment criteria as described in Chapter 11 (Air Quality). It can, therefore, be determined that the construction stage traffic will have a short-term, direct, negative and imperceptible effect on air quality.

**Proposed GCR and TDR Accommodation Areas**

There will be brief to temporary accommodation areas at locations along the TDR and GCR during the construction phase, however these will be transient in nature. This will result in a potential brief to temporary not significant negative effect on human health associated with air quality and dust emissions.

#### 4.4.3.1.2 Noise and Vibration

**Proposed Wind Farm**

In general, the distances between the construction activities associated with the proposed project and the nearest noise sensitive locations (NSL's) are such that there will be no significant noise and vibration effects at NSL's. The source noise levels referred to in Chapter 9 - Noise and Vibration are indicative of the type of plant items and activities associated with the construction of the proposed project. The highest predicted noise levels are expected to occur for only short periods of time at a very limited number of properties. Construction noise levels will be lower than the proposed threshold values.

Noise and vibration effects in terms of the construction phase activities at the wind farm site (including general construction of turbines and hardstand areas, construction of site roads, borrow pits, substation construction, onsite cabling, onsite grid connection, and construction traffic) will be negative, short-term, and not significant.

**Proposed GCR and TDR Accommodation Areas**

There will be accommodation areas required along the route of the proposed GCR and at the proposed TDR accommodation areas during the construction phase, however, these will be short-term in nature. This will result in a potential temporary, not significant, negative effect on human health associated with noise and vibration.

#### 4.4.3.1.3 Water Quality

**Proposed Wind Farm**

During the construction phase of the proposed wind farm, risk of accidental pollution impacting local water quality could potentially arise from the following sources:

- Accidental release of oils, fuels, and other contaminants from construction phase vehicles (on-site and off-site);
- Spillage or leakage of chemicals and fuel / hydrocarbons stored on site;
- Run-off from materials and waste temporarily stored onsite;
- Spillage or leakage of oils and fuels stored and used in the refuelling, operation, and maintenance of construction plant, machinery and vehicles; and
- Spillages arising during the delivery and use of concrete and cement for turbine foundations, roads and hardstanding areas.

The key receptors in terms of water quality impacts and human health are the construction personnel due to the potential for direct contact with polluting substances and water during the construction activities, as detailed in Chapter 8 - Hydrology and Hydrogeology. It is anticipated that any incidents related to accidental release, mobilisation, spillage or leakage of substances would likely be localised, contained, and managed in line with mitigation set out within Chapter 8 and the CEMP (Appendix 2-4). Significant adverse effects on human health due to water quality effects associated with the proposed wind farm are unlikely. Any likely effects related to water quality impacting on human health, from a polluting incident, would be negative, indirect or direct depending on the incident, temporary to short-term, and not significant to slight.

**Proposed GCR and TDR Accommodation Areas**

Section 8.3.1.2.2 of Chapter 8 - Hydrology and Hydrogeology details the proposed GCR and TDR accommodation areas with regard to watercourses. The accommodation areas along the GCR and TDR will be short term and transient in nature. There are no instream accommodation areas proposed as part of the proposed GCR or proposed TDR. Based on the above, the TDR and GCR do not give rise to any additional health effects differing to those discussed above for the proposed wind farm.

#### 4.4.3.1.4 Land / Soils

**Proposed Wind Farm**

Human health-related impacts associated with soil contamination during the construction activities are primarily associated with dust from material extraction and transport of soils and excavated rock, which is discussed under Air Quality above and in Chapter 11 - Air Quality and risks of spills or leaks from construction vehicles, plant, and machinery, which could result in localised contamination of soils. Other negative effects include the typical risks to construction personnel associated with earthworks and large excavations such as falling from heights, engulfment, drowning. The key receptors in terms of soil impacts on human health are the construction personnel due to the potential for direct contact, ingestion or inhalation with polluting substances and soil (which may potentially contain hydrocarbon concentrations from site activities (potential minor leaks and spills of fuels, oils, and paint)) during the construction activities, e.g., excavation / earthworks activities. It is anticipated that any incidents related to accidental release, mobilisation, spillage or leakage of substances would likely be localised, contained, and managed in line with mitigation set out within Chapter 7 (Land, Soils and Geology) and the CEMP (Appendix 2-4).

Taking account of the baseline environmental setting and the proposed mitigation measures during the construction phase, human health risks associated with exposure to contaminants (i.e., via direct contact, ingestion, or inhalation), as well as typical risks described (e.g., falling from heights), resulting from the proposed project are not anticipated, and significant adverse effects on human health due to soil quality effects associated with the proposed project are unlikely. Any likely effects related to soil quality, excavation and earthworks impacting on human health, such as from a polluting incident, would be localised, negative, imperceptible to slight, temporary to short-term, not significant, and unlikely to cause a discernible change to health status of human health receptors.

**Proposed GCR and TDR Accommodation Areas**

the TDR and GCR do not give rise to any additional health effects differing to those discussed above as part of the proposed project.

#### 4.4.3.1.5 Traffic

**Proposed Wind Farm**

Negative effects on road users in terms of traffic are primarily due to traffic delays associated with construction works and vehicle movements, and the associated traffic management measures, such as signage and diversions. Traffic movements associated with the construction phase of the proposed project, such as those associated with the proposed TDR, the proposed TDR accommodation areas, haul routes and accommodation areas along the route of the GCR have the potential to cause impact to local road users.

The estimated traffic increase at Junction No. 4 exceeds the 10% threshold specified in the *TII Traffic and Transport Assessment Guidelines (PE-PDV-02045, May 2014)*. In accordance with these requirements, further detailed junction capacity analysis is therefore required. A PICADY model has been developed for this junction, and the results are discussed in Section 16.8.3.2. Construction haul route traffic assessment found that average and peak traffic volumes will not be significant and temporary to short-term in duration. Chapter 16 (Traffic and Transport)

provides a detailed assessment of impacts associated with construction phase traffic. Effects associated with traffic volumes is variable and is assessed in terms of peak and average activities. Peak traffic volumes are considered the worst-case scenario the proposed project is envisaged to generate with regards to traffic.

Significant adverse effects on road users' human health related to construction phase traffic are considered unlikely. Any likely effects associated with construction phase traffic on sensitive receptors will be slight negative, not significant, and temporary to short-term.

The appointed Contractor and haulage company will be responsible for the temporary traffic management, agreements, and licensing with the Local Authorities and An Garda Síochána during the construction phase.

**Proposed GCR and TDR Accommodation Areas**

Grid connection works will result in disruption for local road users. However, diversions will be provided, local access maintained, and activities will be carried out at off-peak times. The Contractor shall carry out such temporary road closures outside of peak traffic flow times, and only for the duration of the working days. At the time of this construction work and in advance of the required Road Closure, the appointed Contractor shall consult and comply with the Roads Authority, An Garda Síochána and other Emergency services to agree a suitable diversion route prior to implementing a Road Closure.

Chapter 16 – Traffic and Transport assess potential traffic impacts associated with Abnormal Indivisible Loads (AIL), relating to the TDR. The swept path analysis conducted in Chapter 16 indicates locations where temporary accommodations are required to accommodate the component deliveries. These accommodations will result in low volumes of traffic similar to maintenance works by the Local Authority and will be undertaken for a short period of time. The construction of the AIL delivery route works areas will have a likely temporary, slight, negative effect at each pinch point requiring road edge strengthening. The negative effect is due to delays caused to traffic due to the works and the associated traffic management. Additional works required for advanced accommodations will have a slight, negative and temporary effect. For the transport of the AILs by convoy, the volume per convoy is low, however, the impact on the existing road environment will be slight. To allow the vehicles to travel on some of the roads of narrower width, temporary traffic management operations will be required. The effect of the AIL convoy is slight, negative and brief/temporary.

Significant adverse effects on road users' human health related to the proposed GCR and TDR accommodations are considered unlikely. Any likely associated effects on sensitive receptors will be slight negative, not significant, and temporary to short-term.

#### *4.4.3.1.6 Health and Safety*

**Proposed Wind Farm**

All activities carried out by the appointed Contractor on the proposed wind farm will be in accordance with the requirements of the *Safety, Health and Welfare at Work Act 2005* as amended and Regulations made under this Act. The CEMP sets out the Health and Safety requirements for the project including the erection of fencing, signage and notification of commencement of works to the Health and Safety Authority (HSA). This will apply to whatever final turbine dimensions are chosen from the entire proposed range of turbine dimensions.

With adherence to the proper health and safety guidelines throughout the construction phase of the proposed wind farm, significant adverse effects in terms of health and safety related to construction phase are considered unlikely.

**Proposed GCR and TDR Accommodation Areas**

The accommodation areas along the GCR and TDR will be short term and transient in nature. This will result in a potential brief to temporary not significant negative effect on human health associated with air quality and dust emissions.

The proposed TDR to allow for the transport of the turbines to the proposed wind farm site will involve localised and minor vegetation clearance and temporary removal of street furniture. These accommodation areas will be carried out to the relevant construction and road safety guidelines. When the turbine components are being transported, they will have a Garda escort and will be carried out at night when there is less traffic on the road. The proposed turbine delivery accommodation areas allow for the entire range of proposed turbine dimensions.

#### *4.4.3.2 Operational Phase*

##### 4.4.3.2.1 Air quality and dust

**Proposed Wind Farm**

The existing environment surrounding the proposed wind farm currently has a high standard in relation to air quality and current levels of key pollutants are significantly lower than their respective limit values (as per latest EPA Air Quality Monitoring Network and annual air quality reporting data). Refer to Chapter 11 - Air Quality for further details.

There will be little to no emissions to air during the operational phase of the proposed wind farm. Any emissions will mainly result from vehicle use associated with occasional maintenance personnel visits, inspections and maintenance work required at the proposed wind farm. Any vehicular activity has the potential to create nuisance dust and exhaust emissions locally; however, vehicle movements are anticipated to be intermittent and consistent with typical vehicle use and frequency within the local environment.

Furthermore, using the Transport Infrastructure Ireland (TII) criteria referenced in Chapter 11 - Air Quality and Chapter 16 - Traffic and Transportation, there are no road links deemed affected as a result of the proposed wind farm. Therefore, no further assessment using the 2022 TII guidance was required for the operational phase of the proposed project as there is no potential for significant effects to air quality as a result of vehicle emissions. Therefore, effects are considered long-term, direct, negative and imperceptible.

Therefore, significant adverse effects related to air and dust emissions impacting human health during the operation phase are considered unlikely. Any likely effects associated with air quality are anticipated to be indirect slight, positive, and long-term.

Chapter 11 - Air Quality provides a more detail in relation to operational phase air quality and associated emissions.

**Proposed GCR**

There are no anticipated health effects associated with air quality and dust from the GCR during the operational phase.

#### 4.4.3.2.2 Noise and Vibration

**Proposed Wind Farm**

The findings of the noise and vibration assessment (Chapter 9 - Noise and Vibration) confirmed that no significant noise and vibration effects will result from the operation of proposed wind farm, since the predicted turbine noise levels will be within the relevant best practice noise criteria curves for wind farms for the worst case turbine type.

In terms of the proposed on-site substation, will typically be operational on a continuous basis. Chapter 9 -Noise and Vibration has assessed the potential effect associated with the operation of the substation at the nearest NSL. The level of operational noise associated with this infrastructure is to be within the proposed criteria based on review of the applicable guidelines and standards, and it is concluded that there will be no significant noise emissions from the operation of the substation at any NSL.

Vibration effects are not predicted during the operational phase. Furthermore, due to the distance of the proposed infrastructure from sensitive locations, vibration effects are not likely at any NSL.

**Proposed GCR**

There are no anticipated health effects associated with noise and vibration from the GCR during the operational phase.

#### 4.4.3.2.3 Water Quality

**Proposed Wind Farm**

During the operation of the proposed wind farm, accidental pollution impacting local water quality as a result of operational and maintenance activity is not anticipated. However, risk of accidental pollution is still associated with the following:

- Spillage or leakage of machinery on site through routine site maintenance activity during the operational phase;
- Spillages arising relating to the use of substation and hardstanding areas; and
- Risk of pollution from site traffic through the accidental release of oils, fuels, and other contaminants from vehicles.

The key receptors in terms of water quality effects and human health are maintenance personnel due to the potential for direct contact with polluting substances and water during the maintenance activities, as detailed in Chapter 8 - Hydrology and Hydrogeology. It is anticipated that any incidents related to accidental release, mobilisation, spillage or leakage of substances would be localised, contained, and managed in line with mitigation measures set out within Chapter 8 - Hydrology and Hydrogeology.

Overall, significant adverse effects on water quality associated with the operational phase of the proposed project is unlikely. Therefore, any likely effects related to water quality impacting on human health, resulting from a polluting incident, are considered indirect or direct depending on the incident, negative, temporary to short-term, and not significant.

**Proposed GCR**

There are no anticipated health effects associated with water quality from the GCR during the operational phase.

#### 4.4.3.2.4 Land and Soil

**Proposed Wind Farm**

Human health related impacts associated with soil contamination during the operational activities are primarily associated with the risks of spills or leaks from maintenance vehicles and machinery, which could result in localised contamination of soils.

The key receptors in terms of soil impacts on human health are the maintenance personnel due to the potential for direct contact with polluting substances and soil during maintenance activities. It is anticipated that any incidents related to accidental release, mobilisation, spillage or leakage of substances would likely be localised, contained, and managed in line with mitigation set out within Chapter 9 - Land, Soils and Geology.

Overall, human health risks associated with exposure to polluting substances and soil during maintenance activities are not anticipated, and significant adverse effects on human health due to soil quality effects associated with the proposed project are unlikely. Any likely effects on human health resulting from a polluting incident impacting soil quality, would be localised, direct, negative, short-term, and not significant.

**Proposed GCR**

There are no anticipated health effects associated with land and soils from the GCR during the operational phase.

#### 4.4.3.2.5 Traffic

**Proposed Wind Farm**

It is anticipated that the operational phase will generate very little traffic movements (e.g., four movements per day, consisting of two arriving and two departing). The operational traffic volumes were assessed against the TII TTA Guidelines thresholds and were found to be sub-threshold (refer to Chapter 16 (Traffic and Transport)). The operational traffic volumes will result in a low increase in traffic with imperceptible consequence on the road network over the 35 years of operation. In the absence of mitigation, the operational phase is not expected to have a significant effect on the surrounding road network.

Therefore, significant effects on human health related to operational phase traffic are considered unlikely. Furthermore, the maintenance of the visibility splays undertaken during the operational phase will have a positive effect on the safety aspect of the access to the wind farm site. The potential effects associated with the operational phase are therefore considered to be significant, positive, imperceptible, and long-term.

**Proposed GCR**

There are no anticipated health effects associated with Traffic from the GCR during the operational phase.

#### *4.4.3.2.6 Wind Turbine Health Effects*

##### *4.4.3.2.6.1 Noise and Infrasound*

**Proposed Wind Farm**

The referenced publications and studies outlined within this chapter indicate that there appears to be little scientific evidence of effects of "Wind Turbine Syndrome", and that wind farms are not a significant source of noise and infrasound, and that traffic and everyday human activity are likely to be more relevant.

The distances between the proposed wind farm infrastructure and the nearest property receptors are such that significant noise and vibration effects at these receptors are unlikely.

Furthermore, as mentioned above, based on the outcomes of the wind turbine noise assessment (Chapter 9 - Noise and Vibration), the predicted noise levels associated with operational wind turbines will be within best practice noise criteria. and low frequency noise and infrasound associated with wind turbines are expected to be below perceptibility thresholds and not likely to result in any significant effects at NSLs. There are no criteria proposed to assess low frequency noise or infrasound as part of the EIAR.

Therefore, it is predicted that wind turbine noise associated with the proposed project will be not significant. It is therefore concluded that human health effects cited as an outcome of wind turbine noise and infrasound (such as nausea, disturbance of sleep, and tinnitus (ringing in the ear)) generated during the operational phase of the proposed wind farm is unlikely. Any effect in terms of wind turbine noise associated with the operational phase works will be negative, slight and long-term.

**Proposed GCR**

There are no anticipated health effects associated with infrasound from the GCR during the operational phase.

##### *4.4.3.2.6.2 Electromagnetic Interference*

**Proposed Wind Farm and GCR**

The proposed underground electrical cables will adhere to the international guidelines for ELF-EMF (Extremely Low Frequency Magnetic Field) which are described by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). This is a formal advisory agency to the WHO. The proposed wind farm and GCR will also adhere to the EU guidelines for human exposure to EMF (Electric Magnetic Field). As the ICNIRP guidelines will not be exceeded, even directly above the underground cables, there will be no associated operational effects on Human Health.

The on-site substation for the proposed wind farm will be located as indicated in Drawing No. 10955-2010 and Drawing No. 10955-2016. The distance from the nearest sensitive receptor to the on-site substation is approximately 445 m. The construction and electrical components of the substations and associated cabling will be to ESB and EirGrid specifications within the parameters assessed. No health agency has concluded that exposure to EMF from power lines and other electrical sources is a cause of any long-term adverse effects on human, plant or animal health.

Based on the above, this assessment concludes that significant effects on human health as a result of electromagnetic radiation from the proposed wind farm and GCR are unlikely. Therefore, this assessment concludes that any effect in terms electromagnetic radiation / EMF on human health will likely be neutral, not significant and long-term.

#### *4.4.3.2.6.3 Shadow flicker*

'Shadow flicker' is an effect that occurs when the rotating blades of a wind turbine cast a moving shadow over a building. The effect is experienced indoors where a moving shadow passes over a window in a nearby property and results in a rapid change or flicker in the incoming sunlight. Rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun's rays. This can result in a nuisance when the shadow is cast over the windows of a building, primarily concerned with residential properties. This intermittent shadow flicker can be a cause of annoyance at residences near wind turbines.

Shadow flicker is largely dictated by the relative position of the turbine(s) and the window, in combination with weather conditions (i.e., presence of direct sunlight, wind speed and wind direction) and the time of day and year (i.e., affecting the position of the sun). Shadow flicker will occur if the turbine rotors are located between an observer within a dwelling and the sun. The frequency of the flicker effect is related to the frequency of the rotating turbine blades. It can also be dependent on the number of individual turbine rotors that are casting shadows on a window.

Chapter 10 - Shadow Flicker discusses the shadow flicker phenomenon in detail and sets out the criteria which determine the occurrence of shadow flicker, which is summarised as:

- The presence of screening;
- The location and orientation of the property;
- The distance of the property from turbines;
- The presence of direct sunlight;
- The time of day and year;
- Wind speed;
- Direction of wind; and
- The presence of people.

The shadow flicker modelling undertaken (refer to Appendix 10-1) details the potential shadow effects on the identified shadow flicker receptors. The results are discussed in Chapter 10. The Applicant is committed to minimising any adverse effects from the proposed wind farm on the local community. The Applicant has committed to near zero shadow flicker occurrence.

The implementation of mitigation measures to screen shadow flicker effects from sensitive receptors and/or implement wind turbine control measures in accordance with a defined Turbine Shutdown scheme will ensure that any residual shadow flicker effects from the proposed project will be almost entirely eliminated at any shadow flicker receptors. This will be the case irrespective of which turbine dimensions are selected within the turbine range. As noted previously, the immediate shutdown of a turbine(s) is subject to the technical capabilities of turbine technology where controlled and safe slow-down of blade rotation is required, lasting between 1 and 2 minutes at most. This would have an imperceptible long-term effect.

The GCR has no contribution to Shadow Flicker.

#### *4.4.3.2.6.4 Health benefits*

Aside from the potential socio-economic benefits discussed within this chapter, there are significant environmental benefits associated with the operation of the proposed project. The current and historical practice of fossil fuel combustion with the associated release of a range of pollutants including particulate matter, oxides of nitrogen, sulphur dioxide, carbon dioxide and many others is well documented. The release of these pollutants from the power generation sector is also a major contributor to global warming and the resulting changing effects on our climate.

The phasing out of electricity generation from burning fuels in Ireland is a key step in achieving Ireland's 2030 decarbonisation ambition as set out in the Ireland's Climate Action Plan 2025 (CAP25) and the placement of fossil fuels in electricity generation by clean renewable wind energy will have significant benefits for air quality and slowing down global warming.

The proposed project will play a significant role in contributing to the country's national renewable electricity production and binding carbon emissions reduction targets by 2030, while also supporting a growing economy and population. During operation, the proposed wind farm will eliminate the need to generate the equivalent amount of electricity from fossil fuels, and it will therefore help to reduce total national greenhouse gas emissions. As a result, it will reduce our dependence on external energy sources, help improve our energy security of supply and make a major contribution to Ireland's CAP25, which has set a binding target of 9 GW of onshore wind capacity by 2030.

The contribution of the proposed project to a decrease in reliance on fossil fuel combustion will have a moderate positive long-term effect on the health and well-being of the general population.

### 4.4.4 Decommissioning Phase

The wind turbines are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced by new turbines, subject to planning permission being obtained, or the site will be decommissioned fully, with the exception of the electricity substation, site roads, drainage infrastructure and grid connection.

Upon decommissioning of the proposed wind farm, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated, cut up to allow them fit on a standard articulated lorry and removed off-site for recycling.

Turbine foundations will remain in place underground and along with hardstands will be allowed to revegetate naturally. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete and stone from the ground could result in potentially needless environment nuisances such as noise, dust and/or vibration. There would be no real environmental benefit from removing the foundations, as the concrete is underground, stable and inert if untouched. The site roadways will be in use for additional purposes to the operation of the wind farm (e.g. for forest/agricultural access) by the time the decommissioning of the project is to commence, and therefore it is more appropriate to leave the site roads in situ for future use.

The on-site substation and 110 kV grid connection will not be removed at the end of the useful life of the wind farm project as they will form part of the national electricity network. Should decommissioning be required, the activities required to facilitate wind turbine decommissioning and removal from site will be similar to those outlined for the construction phase, albeit in reverse and to a lesser extent and duration than during the construction stage. Therefore, for the purpose of this assessment, it is anticipated that the impacts on population and human health receptors associated with decommissioning phase will be no greater than those identified for the construction phase.

## 4.5 Mitigation Measures

### 4.5.1 Embedded Mitigation

The design of the proposed project has included a minimum setback distance of four times the tip height from a proposed turbine to the curtilage of any residential property. A minimum set back of 740 m has been included in the design which is in exceedance of the minimum setback requirements stated in the 2006 and Draft Revised 2019 WEDGs.

Extensive consideration has been given to the layout of the wind farm site and the positions of the turbines in ensuring adequate set-back distances from sensitive receptors and adjustment for noise, avoidance of environmental constraints, consideration of shadow flicker and visual impacts.

### 4.5.2 Construction Phase

No specific mitigation in relation to the construction phase and the population and human health assessment is proposed other than what has already been set out within the chapters of this EIAR. All activities carried out during the operational phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

Where required, specific mitigation measures for the aforementioned environmental factors, which may interact with human health and the environment are discussed in their respective chapters of this EIAR as outlined in Section 4.1. A cross reference of environmental factors is also presented in Chapter 19 (Interaction of the Foregoing).

Health and safety plans will be developed prior to any construction taking place. A Health and Safety Plan covering all aspects of the construction process will outline Health and Safety requirements in detail. At the procurement stage, the Health and Safety Plan will be prepared on a preliminary basis and developed further at construction stage, with all hazards and risks identified and assessed.

The potential for health and safety and environmental related risks / effects will be greatly minimised through compliance with appropriate health and safety guidelines and the CEMP throughout the construction phase.

**TDR & GCR**

There will be no additional (to the above) mitigation required specifically for the TDR and GCR.

### 4.5.3 Operational Phase

No specific mitigation in relation to the operational phase and the population and human health assessment is proposed.

Where required, specific mitigation measures for the aforementioned environmental factors, which may interact with human health and the environment are discussed in their respective chapters of this EIAR as outlined in Section 4.1. A cross reference of environmental factors is also presented in Chapter 19 (Interaction of the Foregoing).

Other than what has already been set out within the chapters of this EIAR. All activities carried out during the operational phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

Fáilte Ireland has been consulted to identify any potential concerns for adverse tourism impacts, with the response outlined in Table 4-1. Fáilte Irelands response provided guidelines on the Treatment of Tourism in an EIA for projects that involve tourism or may have an impact on tourism. The guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines.

The Community Benefit Fund will provide an opportunity for the local community to invest in local facilities and infrastructure and support local clubs/societies and near neighbours.

### 4.5.4 Decommissioning Phase

As stated previously the wind turbines are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the site will be decommissioned fully, with the exception of the electricity substation and site roads and drainage.

Should decommissioning be required, the activities required to facilitate wind turbine decommissioning and removal from site will be similar to those outlined for the construction phase, albeit in reverse and to a lesser extent and duration than during the construction stage.

All activities carried out by the appointed Contractor during the decommissioning phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.

Therefore, it is anticipated that the effects on population and human health receptors associated with the decommissioning phase will be no greater than those identified for the construction phase.

No specific mitigation is proposed for the decommissioning phase in respect of effects on population and human health.

## 4.6 Residual Effects

### 4.6.1 Construction Phase

The proposed wind farm will have a slight, positive residual effect on the local population through an influx of construction workers in the short-term. This influx is likely to cause a slight increase in local population over a short period of time resulting in a boost to the local economy

through use of accommodation and spend in local shops and restaurants. Local suppliers will also receive additional business from the proposed project. This will have a moderate, short term, positive effect on the local economic activity.

It is considered likely that there will be a brief to temporary, imperceptible, negative residual effect on traffic, tourism and recreation amenity as a result of traffic delays associated with construction works and vehicle movements, and the associated traffic management measures, during the construction phase following the communication of guidance and information to the public on alternative available transport routes / diversions where required.

A short-term, negative and not significant residual effect is likely as a result of construction phase traffic (primarily associated with noise and dust) on residential amenity and sensitive receptors.

Short-term, slight residual effects are predicted on residential amenity and property values and neutral imperceptible effects on the local population and land use.

There will be no additional (to the above) residual effects specifically from the proposed GCR and TDR accommodation areas for the construction phase for population and human health.

### 4.6.2 Operational Phase

The proposed project will provide clean energy from a renewable resource and help to achieve targets in national energy and climate change policies. This is a direct positive long-term residual effect for the country which will benefit the local population and communities.

The establishment of a Community Benefit Fund is considered to be a long-term positive effect on the local community in general. This in turn would have a positive effect on the individuals living in this community and have a positive effect on their individual psychological health through the development of community led projects and maximising the level of local involvement in terms of influencing how the funds are spent.

Overall, it is considered likely that there will be a long-term, slight, positive impact on the local population and human health as a result of the proposed project.

Based on the cumulative impact assessments carried out for shadow flicker, noise, traffic and visual impact, it is considered that there will not be any significant effects on the local population or human health during the operational phase of the proposed project following the implementation of the mitigation measures as set out in the relevant chapters.

Based on the literature reviewed, there is currently no reliable evidence to link wind turbines to adverse health impacts. Every community will have vulnerable individuals; however, the health status of the community can only be established to certain level (i.e., small area statistics). Individual health status or potential vulnerability of individual receptors cannot be known or assessed. Emission limits and management, such as for noise or dust, allow for the protection of the most vulnerable, and so long as the limits are met, vulnerable individuals and the wider community are protected. Emissions arising from the operational phase of the proposed project (i.e., air, dust, noise and vibration) are predicted to fall below the limits and/or thresholds set, therefore it is anticipated that significant adverse effects on health, even amongst the vulnerable, are unlikely.

Following the implementation of the mitigation measures set out in the relevant chapters of the EIAR, the operation of the proposed project is unlikely to have significant negative residual effects on the human health.

Overall, it is considered likely that there will be a long-term, slight, positive residual effect on the local population and human health as a result of the proposed project.

There will be no additional (to the above) residual effects specifically from the TDR and GCR for the operational phase for population and human health.

### 4.6.3 Decommissioning Phase

As mentioned, the wind turbines proposed as part of the proposed project are expected to have a lifespan of 35-years. Following the end of their lifespan, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the site may be decommissioned fully, with the exception of the electricity substation. The activities required to facilitate wind turbine decommissioning and removal from site will be similar to those outlined for the construction phase, albeit in reverses and to a lesser extent and duration than during the construction stage.

It is considered that there will be a short-term, imperceptible, negative effect associated with the works required to decommission the wind turbines at the end of their operational lifetime.

## 4.7 Cumulative Effects

In the assessment of cumulative effects, any other existing, permitted or proposed projects in the surrounding area have been considered where they have the potential to generate in-combination or cumulative impacts with the proposed project (see Appendix 1-6 - Relevant Plans & Projects Considered for Cumulative Assessment).

The potential for likely significant cumulative effects on the local population and human health, in particular from noise, shadow flicker, traffic and visual impacts are discussed in the relevant chapters.

There is potential for operational phase cumulative effects due to noise, shadow flicker and visual impacts associated with other operational wind farms including the neighbouring Faughary wind farm and the Carrickeeny and Tullynamoyle wind farms, which are located 600 m, 8 km and 10 km from the site respectively. These are discussed in the relevant chapters.

### 4.7.1 Population

Considering other planned renewable energy and electrical upgrade projects in the area, the proposed project is anticipated to have both a short and long term positive cumulative effect on population.

#### *4.7.1.1 Land Use*

Considering the other projects in the area, it is not anticipated that the proposed project will have a significant cumulative effect on land use.

#### *4.7.1.2 Population Trends*

Considering the other projects in the area, it is not anticipated that the proposed project will have a significant cumulative effect on population trends. There is a potential positive

cumulative effect in terms of population trends in the event of increased investment in the area from the Community Benefit Fund.

#### *4.7.1.3 Property Receptors/Residential Amenity*

In terms of property receptors and residential amenity, it is not anticipated that there will be significant cumulative effects on residential amenity due to the distance and type of projects planned in the local area.

#### *4.7.1.4 Property Value*

It is not anticipated that there will be significant cumulative effects for property values due to the nature of the site and the distance and type of projects planned in the local area. Any cumulative effect on property value in the area would likely be direct, negative, slight, and short to medium-term.

#### *4.7.1.5 Employment/Economy*

Considering the other projects reviewed in the area, which would all individually contribute to the local employment and economy to varying degrees, the proposed project is anticipated to have both a short and long term, slight positive cumulative effect under the topic of employment/economy.

#### *4.7.1.6 Tourism*

All wind energy projects must now include a Community Benefit Fund, and although the details of how this fund is spent would have to be decided by a committee of representatives from industry and the local community. The proposed Lissinagroagh Wind Farm Community Benefit Fund, outlined in Section 2.10 of this EIAR, has been developed in accordance with the terms and conditions of the Government's Renewable Energy Support Scheme (RESS). There is a potential positive cumulative effect for tourism in the event of increased investment in the area from the community benefit fund.

### 4.7.2 Human Health

There is the potential for both positive and negative cumulative effects under the topic of human health.

Negative cumulative effects primarily relate to traffic (road safety and dust) and the presence of additional work machinery being active in the area if the construction phase of the proposed project and other planned renewable energy/grid upgrade projects coincide.

In terms of traffic, the potential for cumulative effects will occur primarily during the construction phase where construction traffic associated with the proposed project could overlap with construction or operations of other projects, which are currently permitted but not yet constructed, as identified in Section 16.11 of Chapter 16 - Traffic and Transportation.

Positive cumulative effects relate to long term improvements in air quality from decarbonising the national grid and contributions to climate targets.

Other developments proposed in the study area consist of smaller scale projects related to upgrades to electrical or water services, roadworks and retention of existing infrastructure.

### 4.7.3 Summary

The developments/projects/activities identified during the population and human health cumulative assessment (i.e., within 2 km) are not anticipated to have a significant cumulative effect on the above population and human health topics due to their type, scale and/or location with respect to the proposed project.

Overall, significant cumulative effects from the proposed project on population and human health when considered alongside the other developments/projects/activities in the area are not anticipated.

## 4.8 Transboundary Effects

The potential for transboundary effects has been examined having regard to the proximity of the proposed wind farm to Northern Ireland. A review of relevant planning applications and permitted developments within the Northern Ireland jurisdiction at the time of assessment has not identified any developments of sufficient scale or proximity that would result in significant transboundary or cumulative effects when considered in combination with the proposed project.

The proposed project itself will not result in significant effects in Northern Ireland on the population and the human health of its residents. Accordingly, no likely significant transboundary effects are anticipated in respect of this topic.

## 4.9 Conclusion

Emission limits, such as for noise or dust, are set to protect the most vulnerable in a community rather than the most robust. Compliance with the limits set out in best practice guidelines (described in the relevant chapters on noise and vibration, air quality, shadow flicker) will ensure that individuals and communities are protected.

Design stage considerations, such as turbine locations, and the mitigation measures outlined in Section 4.5 and in specific technical chapters will be put in place to ensure that the emissions and effects from the proposed project are in compliance with the relevant standards to ensure that there will be no significant adverse effects on health, even amongst the most vulnerable.

Following consideration of the residual effects as set out in Section 4.6, it is considered that that proposed project will not result in a significant negative impact on population and human health in the local and regional area.

## 4.10 REFERENCES

Department of Housing, Planning and Local Government (DoHPLG), *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (2018)

Environmental Protection Agency (EPA), *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (2022)

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Institute of Public Health Ireland, *Health Impact Assessment Guidance: Manual & Technical Guidance* (2021

Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects (July 2023).

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World Health Organisation (WHO), *Environmental Noise Guidelines for the European Region* (2018)

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WHO, *Global Air Quality Guidelines* (2021)