4. POPULATION AND HUMAN HEALTH

4.1 Introduction

This section of the rEIAR identifies, describes and assesses the potential significant effects of the Subject Development on population and human health and has been completed in accordance with the EIA guidance and legislation set out in Chapter 1: Introduction. A detailed description of the Subject Development is provided in Chapter 3 of this rEIAR.

Impacts of a development that may impinge on human health, directly and indirectly, positively and negatively have been considered. The key issues examined in this chapter of the rEIAR include employment, settlement and land use patterns, population and demographic trends, tourism and amenity, and human health (health and safety). Vulnerability of Subject Development to risk of major accidents and /or disasters is dealt with separately, please see Chapter 13 for further details.

As the Subject Development does not include any changes to the turbine locations or turbine dimensions associated with the Permitted Development, there is no potential for shadow flicker associated with the Subject Development. Therefore, shadow flicker is not addressed further in this chapter.

4.1.1 Statement of Authority

This section of the rEIAR has been prepared by Thomas Blackwell with the support of Malena Thren and reviewed by Michael Watson.

Thomas is a Senior Environmental Consultant with MKO with over 17 years of progressive experience in environmental consulting. Thomas holds a BA (Hons) in Geography from Trinity College Dublin and a M.Sc. in Environmental Resource Management from University College Dublin. Prior to taking up his position with MKO in August 2019, Thomas worked as a Senior Environmental Scientist with HDR, Inc. in the United States and held previous posts with private consulting firms in both the USA and Ireland. Thomas is a registered Professional Wetland Scientist with the Society of Wetland Scientists with specialist knowledge in wetland assessment and delineation, mitigation planning and design, stream geomorphic assessment, and stream and wetland restoration design. Thomas' key areas of expertise include fluvial geomorphology and stream restoration design. Thomas has provided stream restoration design, and construction oversight for numerous private and publicly funded projects in multiple jurisdictions.

Malena Thren is a Graduate Environmental Scientist with MKO. Malena holds a first-class Honours in BSc (Hons) Environmental Science from NUI Galway (2023). Prior to taking up her position with MKO in September 2023, she worked with the university and local authorities on a variety of award-winning environmental campaigns as Students' Union Officer and Sustainability Leadership Intern. Her key strengths and expertise are in report writing, research and communication and she is experienced in data analysis and QGIS mapping. Since joining MKO, Malena has been involved in the preparation of Environmental Impact Assessment Screening and Scoping Reports, License Monitoring, Project Management, Construction Management Plans, Environmental Impact Assessment Reports, Research projects and Environmental Reports.

Michael Watson is a Director of Environment in MKO. Michael has over 20 years' experience in the environmental sector. Following the completion of his master's degree in environmental resource management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael's professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and industrial sectors nationally. Michaels key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Michael is a key member of the MKO senior management team and as head

of the Environment Team has responsibilities to mentor various grades of team members, foster a positive and promote continuous professional development for employees. Michael also has a Bachelor of Arts Degree in Geography and Economics from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and Professional Geologist (PGeo).

4.1.2 Relevant Guidelines

In addition to the guidelines set out in the EPA 2022 report and Directive 2011/92/EU as amended by Directive 2014/52/EU, the following guidelines, plans and reports have also influenced the preparation of this chapter:

- Department of Health – Health in Ireland: Key Trends 2022;
- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);
- 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 the Environment, Heritage and Local Government Draft Wind Energy Development Guidelines (2019);
- Environmental Impact Assessment of National Road Schemes- A practical Guide, National Roads Authority/ Transport Infrastructure Ireland, Revision 1, November 2008;
- Fáilte Ireland EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects, July 2023.
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022)
- Health Impact Assessment Resource and Tool Compilation, United States Environmental Protection Agency 2016;
- Health Impact Assessment Guidance, Institute of Public Health Ireland. 2009;
- Framework for Human Health Risk Assessment to Inform Decision Making developed by the United States Environmental Protection Agency (US EPA) 2014;
- Institute for Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportionate Assessment;
- Institute for Environmental Management and Assessment (2022) Determining Significance for Human Health in Environmental Impact Assessment;
- Central Statistics Office (CSO): Census of Ireland 2016; Census of Ireland 2022; Census of Agriculture 2020;
- Donegal County Council Development Plan 2018-2024 (as varied)
- The World Health Organisation (WHO) Environmental Noise Guidelines for the European Region (WHO, 2022 Update) https://www.who.int/
- Draft County Donegal Development Plan 2024-2030

4.1.3 Scoping

Chapter 2 Section 2.5 of this rEIAR describes the scoping and consultation exercise undertaken for the Subject Development.

Health Service Executive

A scoping response was received from the Health Service Executive (HSE) on the 22nd February 2024. The response stated that the Environmental Impact Assessment should examine all likely significant impacts and provide the following information for each:

- Description of the receiving environment;
- The nature and scale of the impact;
- An assessment of the significance of the impact;
- Proposed mitigation measures;
- Residual impacts.

Directive 2014/52/EU has an enhanced requirement to assess likely significant impacts on Population and Human Health. It is the experience of the Environmental Health Service (EHS) that impacts on human health are often inadequately assessed in EIAs in Ireland. It is recommended that the wider determinants of health and wellbeing are considered in a proportionate manner when considering the EIA. Guidance on wider determinants of health can be found at www.publichealth.ie

The Environmental Health Service (EHS) recommends that the following matters are included and assessed in the rEIAR:

- Public Consultation
- Population and Human Health
- Water (Hydrology and Hydrogeology)
- Land and Soils
- Air, Dust and Odour
- Climate Change and Opportunity for health Gain
- Noise and Vibration
- Waste Management
- Ancillary facilities
- Cumulative Impacts

Irish Water

Irish Water provided a response to a scoping request on the 19th of February 2024, outlining the measures for consideration in the scope of an Environmental Impact Assessment (EIA). This includes steps to avoid any adverse effects on Irish Water's Drinking Water Source(s) during both the construction and operational phases of the development, as well as an assessment of potential impacts on nearby public water supply infrastructure.

Fáilte Ireland

A scoping response was received from Fáilte Ireland on the 7th of February 2024 and provided the 'Fáilte Ireland's EIAR Guidelines for the consideration of Tourism and Tourism related Projects', to inform the preparation of an EIAR. The report provides guidance for those conducting EIA and compiling an EIAR or those assessing EIARs, where the project involves tourism or may have an impact upon tourism (see Section 4.3.9 for further detail). These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2 of the guidance document, including some of the key requirements for an EIAR under the current guidance:

- Project description;
- assessment of alternatives considered;
- baseline assessment;
- assessment of effects;
- cumulative impacts
- interaction of impacts;
- mitigation & monitoring; and
- residual impacts

4.2 Assessment Methodology

4.2.1 Population

A desk-based assessment using sources and guidelines referenced in 4.1.2 above was undertaken to examine relevant information pertaining to the population impact assessment. Information on population statistics, employment and social data for the relevant Electoral Divisions (Eds) were obtained from the Central Statistics Office (CSO) for census years 2016 and 2022.Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects was also considered in this assessment.

The Population Study Area for this assessment mainly focuses on the electoral divisions (ED) within which the Subject Development lies, but it also refers to County and national statistics.

4.2.2 Human Health

There were no emissions to environmental media which could have impacted receptor locations associated with the Subject Development, which could have led to environmental effects which in turn could have impacted on human health. The construction phase is now complete, Post construction, there is no potential for impact on health receptors such as water abstractions. No hydrocarbon spills occurred and the borrow pits, peat cells and other deviations have been confirmed as stable, from an environmental perspective and safe from a Health & Safety perspective. Therefore, the aspect of Human Health is not anticipated to be negatively affected given the nature of the Subject Development and since the construction of the Subject Development is now complete.

4.3 Baseline Environment- Population

4.3.1 Baseline Population

Information regarding population and general socio-economic data were sourced from the Central Statistics Office (CSO), the County Donegal County Development Plan 2018-2024 (as varied), Fáilte Ireland and the literature and guidelines as listed in section 4.1.2 above.

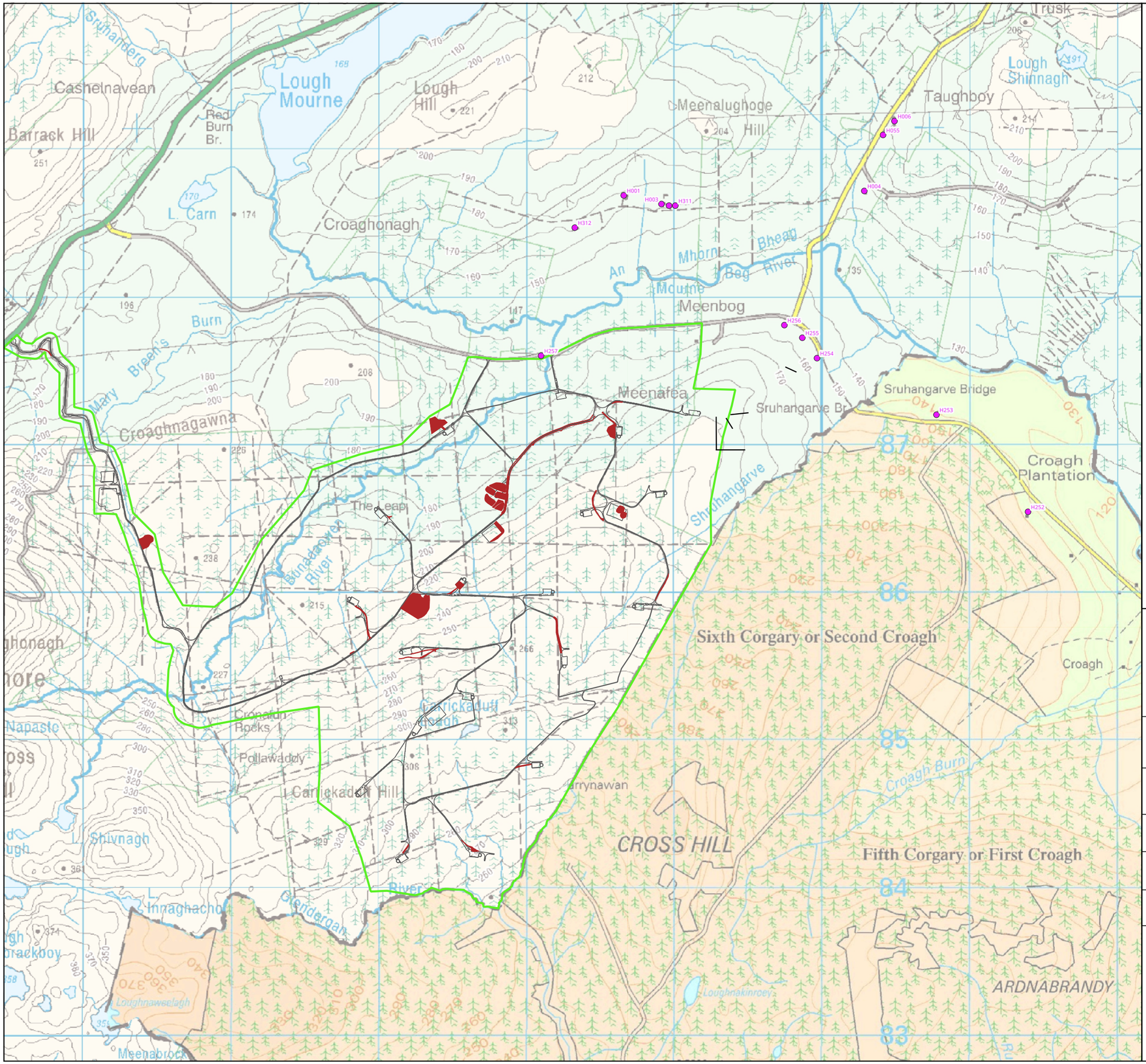
The study included an examination of the population and employment characteristics of the area. This information was sourced from the Census of Ireland 2022, the most recent census for which a complete dataset is available, also the Census of Ireland 2016, as the Subject Development was constructed from November 2019 to November 2020, the Census of Agriculture 2020 and from the CSO website (www.cso.ie). Census information is divided into State, Provincial, County, Major Town, District Electoral Division (DED) and small areas level.

4.3.1.1 Receiving Environment

The Site is located in County Donegal approximately 8km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12km northeast of Donegal Town. Please refer to Figure 1-1 of Chapter 1: Introduction, for the Site Location map. The N15 National Road runs South-West to North-East along the western boundary of the Site with the main wind farm area lying about 2km east of the road. The Site measures approximately 903 hectares within the townlands of Meenbog and Croaghonagh. The Site borders County Tyrone in Northern Ireland, specifically the administrative division of Omagh West and the townland of Termonamongan along the Southeast Site boundary The surrounding land use predominantly comprises peat bogs, commercial forestry and other seminatural areas with limited residential use along local roads. Existing access is off the N15 road in the west of the Site and the local road north of the Site.

Receptor locations in the area are typically residential detached houses that are sporadically spread throughout the study area that are potentially affected by the Subject Development with regards to Population and Human Health. 14 Receptor locations were identified in the original EIAR application and validated during a site visit in December 2023. Deviations 20 and 21 are the closest work areas to a receptor location which is identified as receptor H257. The distance between the work areas and the receptor is noted as 500m. Receptor H257 appeared vacant during the site visit in December 2023. Figure 4-1 below shows the Subject Development in context with the receptor locations as identified in the EIAR for the Permitted Development.

In order to assess the population in the vicinity of the Site, the 'Population Study Area' for the population section of this rEIAR was defined in terms of the Electoral Divisions (EDs), formerly known as District Electoral Divisions, which is the smallest legally defined administrative area for which population statistics are published. They were historically subdivisions of poor law unions and have been slightly amended by the Central Statistics Office (CSO) to render them suitable for statistical use. (CSO, 2022). The Site lies within one DED, Goland Donegal. The Subject Development lies fully within this ED. This ED will be referred to hereafter as the Population Study Area for this chapter. The Population Study Area has fallen slightly from a population of 372 in 2016 (CSO, 2016) to a population of 359 as of 2022 (CSO, 2022. The land area of the Population Study Area totals 4232.4 hectares. The Population Study Area is shown in Figure 4-2 below.



Map Legend

- rEIAR Study Area
- Subject Development Footprint
- Permitted Development Footprint
- Receptor Locations

Drawing Title

Receptor Locations

Project Title

Substitute Consent for Deviations at Meenbog Wind Farm, Co. Donegal

Drawn By	Checked By
MT	TB
Project No.	**Drawing No.**
220623	Figure 4-1
Scale	**Date**
1:25,000	2024-03-21

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4.3.2 Demographic Trends

The recently published Census of 2022 shows that the population of Donegal grew by 5% to 167,084 since the 2016 Census. Moreover, the number of people in the County rose by 7,932 between April 2016 and April 2022. Over the same period, Ireland's population grew by 8% from 4,761,865 to 5,149,139. Population statistics for the State, County Donegal and the Population Study Area have been obtained from the Central Statistics Office (CSO) and are presented in Table 4-1 below.

Table 4-1 Population 2016 – 2022 (Source: CSO)

Area	Population Change		Percentage Population Change
	2016	2022	2016– 2022
State	4,761,865	5,149,139	8.1%
County Donegal	159,192	167,084	5%
Population Study Area	372	359	-3.5%

The data presented in Table 4-1 shows that the population of the Population Study Area decreased by 3.5% between 2016 and 2022. This rate of population decline is exhibiting an opposite trend than that recorded at State and County level.

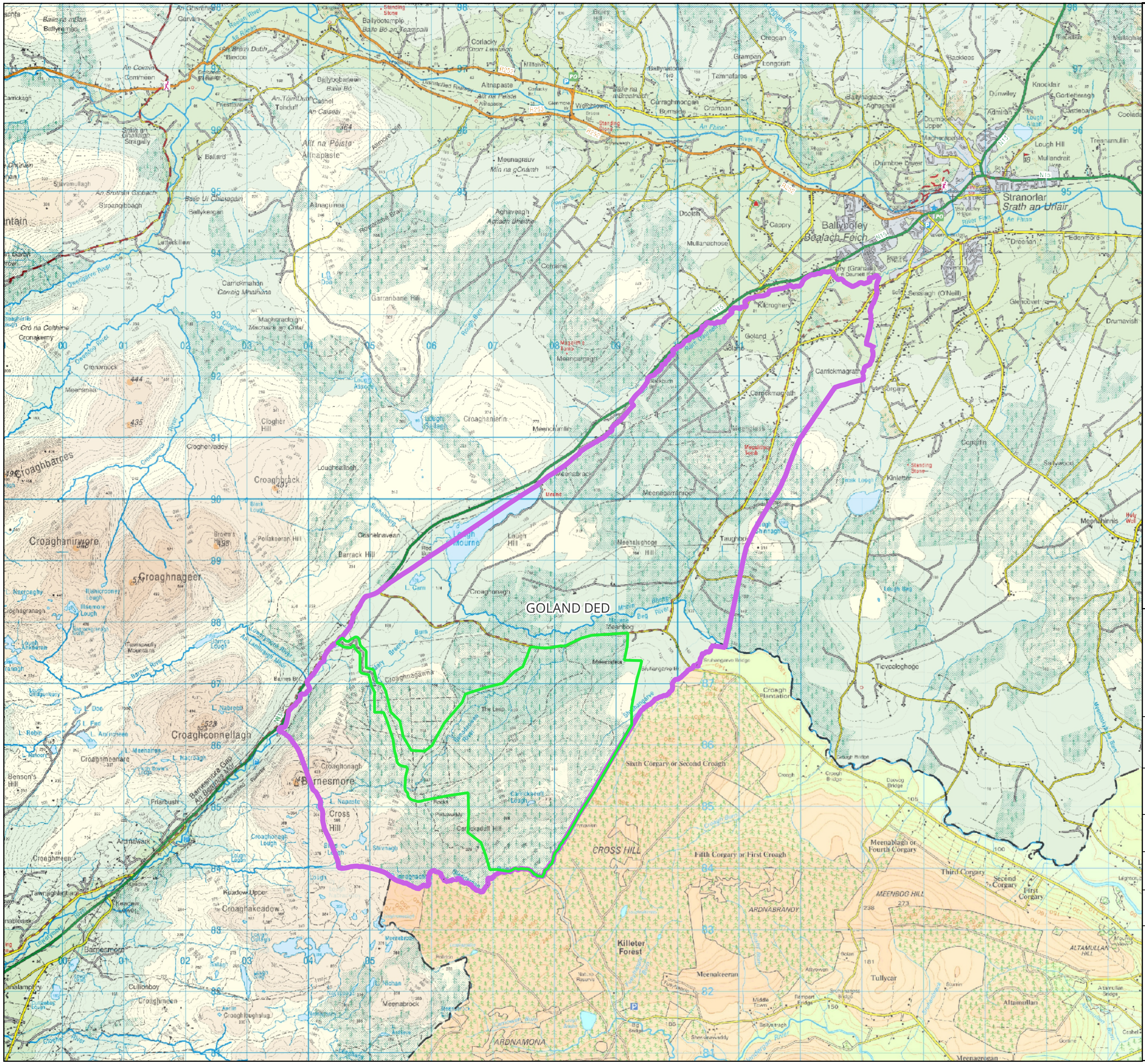
4.3.3 Population Density

The population densities recorded within the State, County Donegal and the Population Study Area during the 2016 and 2022 Census are shown in Table 4-2.

Table 4-2 Population Density in 2016-2022 (Source: CSO)

Area	Population Density (Persons per square kilometre)	
	2016	2022
State	67.8	73.3
County Donegal	32.8	34.4
Population Study Area	8.8	8.5

The population density of the Population Study Area recorded during the 2022 Census is 8.5 persons per km^2 which is considerably lower than the national population densities of 73.3 persons per km^2 and also considerably lower than the population density of County Donegal, recorded at 34.4 persons per $km,^2$ respectively.



Map Legend

- rEIAR Study Area
- Population Study Area

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Drawing Title	
Population Study Area	
Project Title	
Substitute Consent for Deviations at Meenbog Wind Farm, Co. Donegal	
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MT	TB
Project No.	**Drawing No.**
220623	Figure 4-2
Scale	**Date**
1:60,000	2024-03-06

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4.3.4 Household Statistics

The number of households and average household size recorded within the State, County Donegal and the Population Study Area during the 2016 and 2022 Censuses are shown in Table 4-3.

Table 4-3 Number of Household and Average Household Size 2016 – 2022 (Source: CSO)

Area	2016		2022	
	No. of Households	Avg. Size (persons)	No. of Households	Avg. Size (persons)
State	1,697,665	2.8	1,841,152	2.7
County Donegal	58,505	2.7	61,780	2.7
Population Study Area	122	3	123	2.9

The number in table 4-3 show that while the number of households within the State, County and the EDs increased, the average number of people per household remained the same due to the proportionate increase in population during this period. Average household size recorded within the Population Study Area during the 2016 and 2022 Censuses are slightly higher than those observed at State and County level during the same time period. Average household sizes in the Population Study Area have slightly decreased during the 2016 to 2022 period.

4.3.5 Age Structure

Table 4-4 presents the population percentages of the State, County Donegal and Population Study Area within different age groups as defined by the Central Statistics Office during the 2022 Census. This data is also displayed in Figure 4-3.

Table 4-4 Population per Age Category in 2022 (Source: CSO)

Area	Age Category				
	0 - 14	15 – 24	25 - 44	45 - 64	65 +
State	19.7%	12.5%	27.6%	25.1%	15.1%
County Donegal	20.4%	11.8%	23.7%	26.3%	17.7%
Population Study Area	18.4%	16.4%	14.5%	36.5%	14.2%

County Donegal's population in April 2022 was comprised of 167,084 people. The average age of Donegal's population in April 2022 was 40.1 years, compared with 38.5 years in April 2016. Nationally, the average age of the population was 38.8, up from 37.4 in April 2016. The number of people aged 65 and over continues to grow. This age group increased by 19% to 29,623 in Donegal, and by 22% to 776,315 at a national level since 2016. The proportion of the ED Population Study Area population within each age category is similar to those recorded at national and County level for most categories. There is considerably less residents of the Population Study Area aged 25-44 than on County and national level, and considerably more people aged 45-64. For the Population Study Area, the highest population percentage occurs within the 45-64 age category.

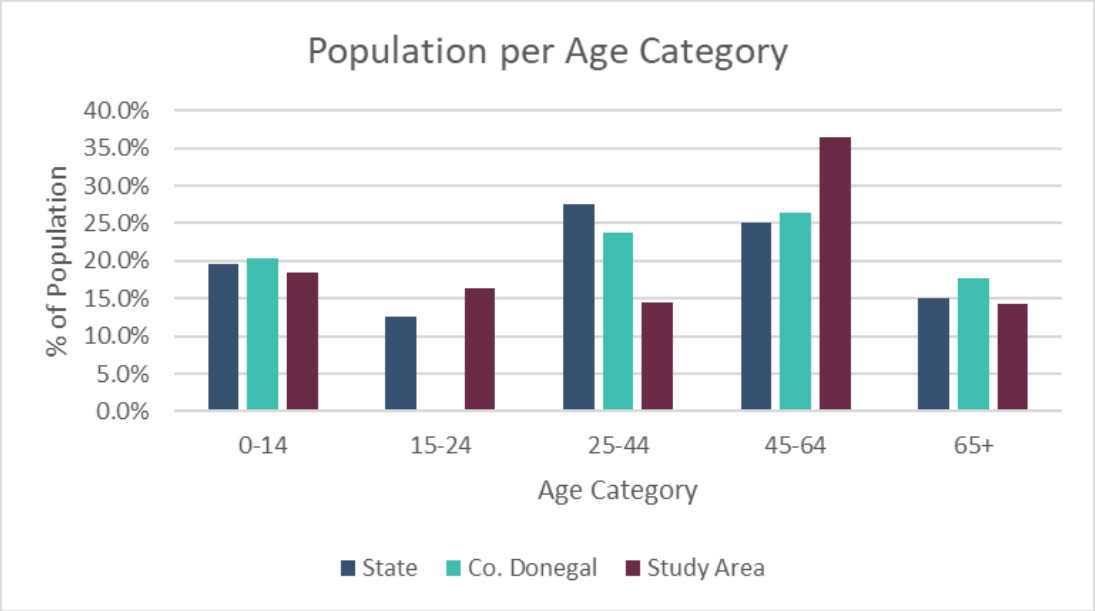

Figure 4-3 Population per Age Category in 2022 (Source: CSO)

4.3.6 Employment and Economic Activity

4.3.6.1 Economic Status

The labour force consists of those who can work, i.e., those who are aged 15+, out of full-time education and not performing duties that prevent them from working. There were 67,977 people (aged 15 and over) at work in Donegal, an increase of 9,624 people (+16.4%) between 2016 and 2022. Nationally, there were 313,656 additional people (+16%) at work. This number is further broken down into the percentages that were at work, seeking first time employment or unemployed. It also shows the percentage of the total population aged 15+ who were *not* in the labour force, i.e., those who were students, retired, unable to work or performing home duties. The data regarding economic status is presented in table 4-5 below.

Table 4-5 Economic Status of the Total Population Aged 15+ in 2022 (Source: CSO)

Status		Republic of Ireland	County Donegal	Population Study Area
% of population aged 15+ who are in the labour force		**61.2%**	**57.2%**	**53.9%**
% of which are:	At work	91.7%	89.4%	94.3%
	First time job seeker	1.4%	1.6%	1.3%
	Unemployed	7.0%	9.1%	4.4%
% of population aged 15+ who are not in the labour force		**38.8%**	**42.8%**	**46.1%**
% of which are:	Student	28.6%	24.0%	31.9%
	Home duties	17.0%	16.6%	14.8%
	Retired	41.0%	45.6%	36.3%
	Unable to work	11.8%	12.6%	15.6%
	Other	1.7%	1.2%	1.5%

Overall, the principal economic status of those within the labour force living in the Population Study Area is lower than that recorded at State and County level, with between 0 to 5% average difference apparent. However, the percentage of the population 'At work' is higher in the Population Study Area than on State

or County level. Of those who were not in the labour force during the 2022 Census, the highest percentage of the population in the Population Study Area was in the 'Retired' category, which is the same as numbers recorded at national and County level that show 'retired' as the highest category. Furthermore, the percentage of the population in the 'Student' category was higher than on State and County level.

4.3.6.2 Employment by Socio-Economic Group

Socio-economic grouping divides the population into categories depending on the level of skill or educational attainment required. The 'Higher Professional' category includes scientists, engineers, solicitors, town planners and psychologists. The 'Lower Professional' category includes teachers, lab technicians, nurses, journalists, actors and driving instructors. Skilled occupations are divided into manual skilled, such as bricklayers and building contractors; semi-skilled, e.g. roofers and gardeners; and unskilled, which includes construction labourers, refuse collectors and window cleaners. Figure 4-4 shows the percentages of those employed in each socio-economic group in the State, County Donegal and the Population Study Area during 2022.

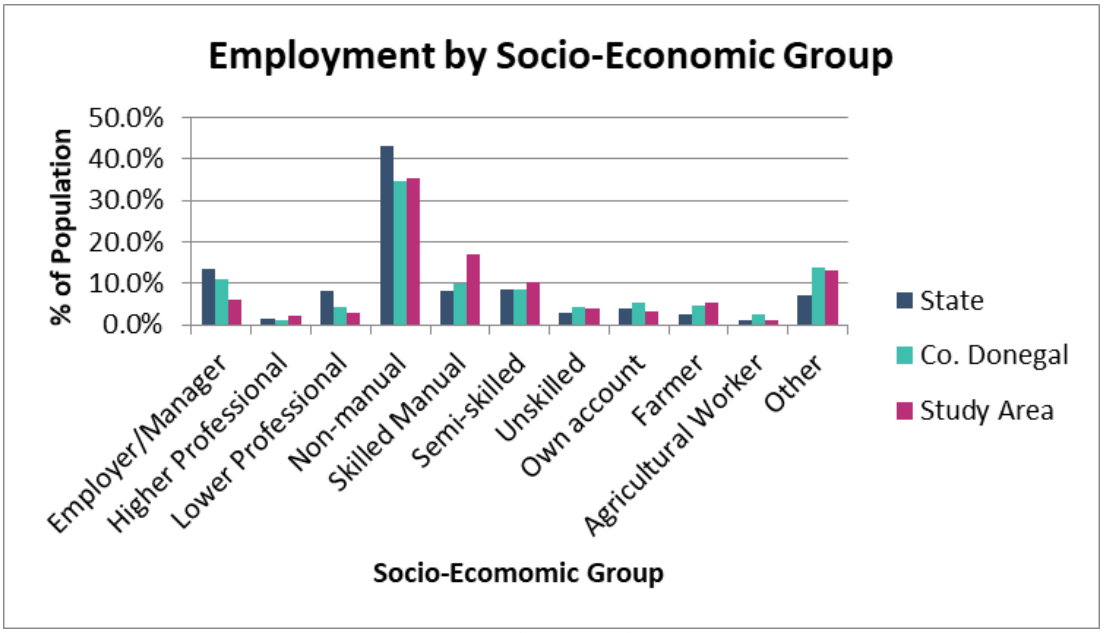

Figure 4-4 Employment by Socio-Economic Group in 2022 (Source CSO)

The highest levels of employment within the Population Study Area were recorded in the Non Manual category. Across most socioeconomic groups, the levels of employment were similar across State, County and Population Study Area level. However, the levels of employment within the 'Skilled Manual' or 'semi-skilled' socioeconomic group and 'Farmer' were all higher than those on State and County level. On the opposite end, 'Employer/Manager' was considerably lower than on State and County level.

4.3.7 Land Use Patterns and Activities

The primary surrounding land use within the Population Study Area is that of forestry and agriculture. The total area of farmland within the Population Study Area measures approximately 1,150.1 hectares, comprising 27.2% of the Population Study Area, according to the CSO Census of Agriculture 2020. There are 37 farms located within the the Population Study Area, with an average farm size of 31.1 hectares. This is in line with the average 27.4-hectare farm size for County Donegal. Farmland in the Population Study Area comprises exclusively of grassland, at 1,132.8 hectares. Commercial forestry is considerably higher in the Population Study Area than for County Donegal. According to *Ireland's National Forest Inventory 2022 Main Findings* (Department of Agriculture, Food and the Marine, 2023), County Donegal has a forest cover of 11.8% which is considerably lower than that of approximately 59.6% measured in the Population Study Area. Table 4-6 gives an overview of land use in the Population Study Area.

Table 4-6 Land Use Patterns in the Population Study Area (Source: CSO, OSI maps)

Characteristic	Value
Size of Population Study Area	4,232.4 hectares
Total Area Farmed within Population Study Area	1,150.1 hectares
Farmland as % of Population Study Area	27.2%
Forestry as % of Population Study Area	Approximately 59.6%
Breakdown of Livestock	**Number**
Cattle	330
Sheep	3,246

4.3.8 Services

The Site is located in County Donegal approximately 8km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12km northeast of Donegal Town. Both centres provide retail, recreational, educational, and religious services.

4.3.8.1 Education

The nearest primary school is St. Francis National School and is approx. 8.5km southwest of the Site. Beyond that are Dooish national School and Scoil Seiseadh Ui Neill approx. 11km north of the Site close to the twin towns of Ballybofey and Stranolar. The nearest secondary schools are located in the twin towns of Ballybofey and Stranolar approximately 13km north of the Site, namely St. Columba's College and Finn Valley College. There is also a number of secondary schools in Donegal town, approximately 15km southwest of the Site. Multiple third level location centres are located in the vicinity of the Site. The Atlantic Technological University (Donegal Letterkenny Campus) approximately 30km south of the Site and the Atlantic Technological University (Donegal Killybegs Campus) approximately 35km southwest of the Site. Furthermore, Donegal Medical Academy is located approximately 30km south of the Site and the Southwest college (Omagh Campus) is located approximately 42km east of the Site in Northern Ireland.

4.3.8.2 Access and Public Transport

The Site is currently accessible via the N15 to the west of the Site and a Local road to the north of the Site.

There are three local bus services provided by Local Link – Donegal Sligo Leitrim through private bus operators. Bus routes 264 Ballyshannon to Letterkenny and 988 Cloghan to Letterkenny pass the Site entrance off the N15 Monday to Friday and the Bus Eireann route 480 from Sligo to Derry passes the Site entrance off the N15 daily.

There is no bus stop in the vicinity of the Site. The nearest train station to the Site is the Derry train station 50kmkm northeast of the Site in Northern Ireland providing connection to Belfast, and Sligo train station approximately 60km South of the Site providing connection with Dublin Heuston.

4.3.8.3 Amenities and Community Facilities

There are no amenity or community facilities located within or adjacent to the Site, and there are limited amenities in the surrounding area. Located 3.8km away from the Site is the Biddy O'Barnes gastropub and car park. Amenities and community facilities, including other sports clubs, youth clubs, recreational areas and water sport activities are located in the twin towns of Ballybofey and Strabane and Donegal town.

4.3.9 Tourism and Amenity

4.3.9.1 Tourism Numbers and Revenue

Tourism is one of the major contributors to the national economy and is a significant source of full time and seasonal employment. The most recent publication by Failte Ireland pertaining to international tourism volumes for Ireland was published in 2021 for the year 2019. *Key Tourism Facts 2019* states that during 2019, overseas tourists to Ireland grew by 0.7% to 9.7 million. In 2019, out-of-state (Overseas and Northern Ireland) tourist expenditure amounted to €5.6 billion. With a further €1.8 billion spent by overseas visitors on fares to Irish carriers, foreign exchange earnings were €7.4 billion. Domestic tourism expenditure is presented in Failte Ireland's *Key Tourism Facts 2022,* published in October 2023, and amounted to €2.9 billion, which represents a 38% rise in domestic tourism income since 2019. Estimates put income from oversea tourism in 2023 at €5.3billion (Irish Tourism Industry Confederation, 2023), making tourism in 2023 a €8.2billion industry. The Central Statistics Office's official count of direct employment in 'Accommodation and food service activities', a category which includes hotels, restaurants, bars, canteens and catering, was 177,700 in Q3 2019, just before construction began on the Subject Development in November 2019 which represents 9.5% of total employment in the State.

The Republic of Ireland is divided into seven tourism regions. Table 4-7 shows the total revenue and breakdown of overseas tourist numbers to each region in Ireland in 2019 ('*Key Tourism Facts 2019*, Fáilte Ireland, March 2021).

Table 4-7 Overseas Tourists Revenue and Numbers 2019 (source Fáilte Ireland)

Region	Total Revenue (€m)	Total Number of Non-Domestic Tourists (000s)
Dublin	€2,305m	6,927
Mid-East/Midlands	€ 400m	1,124
South-East	€282m	995
South-West	€995m	2,373
Mid-West	€480m	1,455
West	€701m	2,056
Border	€411m	1,365
Total	**€5,574 m**	**16,295**

The Border Region, in which the Site is located, comprises of Donegal, Sligo, Leitrim, Cavan, Monaghan and Louth. This Region benefited from approximately 9% of the total number of overseas tourists to the country and approximately 9% of the total tourism income generated in Ireland in 2019.[1]

Table 4-8 presents the County-by-County breakdown of overseas tourist numbers and revenue to the West Region during 2017 ('*2017 Topline Tourism Performance by Region,* Fáilte Ireland, August 2018)[2]. There

1 Failte Ireland Key Tourism Facts 2019, March 2021. Available at: https://www.failteireland.ie/FailteIreland/media/WebSiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/KeyTourismFacts_2019.pdf?ext=.pdf

2 2017 Topline Tourism Performance By Region, Fáilte Ireland, August 2018. Available at: https://www.failteireland.ie/FailteIreland/media/WebSiteStructure/Documents/3_Research_Insights/2_Regional_SurveysReports/2017-topline-regional-tourism-performance.pdf?ext=.pdf

is no published County by County tourism breakdown for 2018 to 2022 to date. As can be observed, Donegal had a tourism revenue of €178 million.

Table 4-8 Overseas Tourism to Border Region during 2017 (Source: Fáilte Ireland)

County	Revenue Generated by Overseas and domestic Tourists (€m)	No. of Overseas Tourists (000s)
Cavan	80	107
Donegal	178	255
Leitrim	50	41
Louth	85	172
Monaghan	55	60
Sligo	96	173

4.3.9.2 Tourism Barometer: Strategic Research and Insight September 2023

Failte Ireland conducted a research survey in September 2023 aimed at the hotel and food service industry which compared visitor volumes in 2023 to date with 2022 figures in order to gauge the health of the industry, to predict expected volumes for the rest of the year and to shed light on the positives and areas of concern the industry is currently facing. The results are as follows:

- Better year so far in terms of visitor levels
- About half (52%) of businesses have had more visitors to date this year compared to 2022; 27% have had fewer.
- The highest proportions reporting to be up on last year are found among Dublin businesses (65%), inbound tour operators & DMCs (77%), attractions (66%) and hotels (68%)
- The return of overseas visitors is behind the good performance, especially the North American market, whereby 59% of operators report being up year to date, compared to only 22% reporting the market to be down.
- Increased visitor levels are not necessarily resulting in improved profitability.
- 61% of activity providers have had fewer visitors this year, compared to 31% reporting being up.
- Hotels remain the best performing accommodation sector where 68% of hotels have had more visitors to date this year vs 12% down.
- The food & drink sector is down, as are activity providers, where 61% report being down vs 31% being up.
- Rising costs (to businesses or consumers) dominate concerns again.
- Operating costs to the business (energy or otherwise) form the top two concerns in nearly every sector and in all regions.
- In spite of cost pressures, 37% cite 'investment in the business' and 37% cite 'own marketing' as a reason to be positive.

In spite of growing costs, the industry is slowly recovering with a majority of businesses predicting that the remainder of 2023 will see an increase in domestic and overseas visitors in comparison to 2022 visitor numbers.

4.3.9.3 Tourism Attractions

There are no tourist attractions within the Site. However, the Northwest Cycle Trail runs from the North of the Site along the N15 west of the Site.

4.3.9.3.1 Tourism Attractions within the surrounding landscape

The nearest identified tourist attraction is the Northwest Cycle trail, running for approximately 7km within a km of the Site boundary. It has a total length of 325km running from Enniskillen through Sligo, Donegal, Lifford, Strabane to Omagh.

County Donegal has a wide range of nationally significant tourism assets which include the following:

- The Glenveagh National Park- a walking, cycling, sightseeing, fishing destination and other outdoor activities, that surrounds Glenveagh Castle, built in the 19th century.
- The River Corrib and Lough Corrib – important recreational amenity and fisheries areas.
- Hiking or walking opportunities such as the Slieve League (Sliabh Liag) mountain range, Errigal mountain, and Ards Forest Park, all of which are important centres for walking, cycling, horse-back riding and adventure related activities.
- The Coastline along the Wild Atlantic Way– Scenic coastline and peninsulas and marine related activities including some fine blue flag beaches.
- The Gaeltacht areas which are of significant cultural heritage value and frequently visited by tourists.
- Fanad Head Lighthouse – built in 1817, the lighthouse can be accessed and offers scenic views of north Donegal
- Torrin and Arranmore Islands and other picturesque islands along the County's coast.
- The Towns and Villages of County Donegal where there is significant potential for heritage led tourism.

Archaeological sites and monuments are part of Irish national heritage and are recognised tourist attractions across the country. National Monuments within 20km of the Site are listed below. No recorded archaeological monuments are located within the Site of the Subject Development. Please see Chapter 10 Cultural Heritage for further details.

- Todd's Den Wedge Tomb is located in Churchtown, Northern Ireland, approximately 18km east of the Site is a megalithic tomb on private lands.
- Druids Altar Portal Tomb is located approximately 17.5km east of the Site also in Churchtown and is comprised of a single chambered tomb with two portal stones, which is incorporated into a private field wall.
- A standing stone is located in Berrysfort, Northern Ireland, approximately 18km east of the Site and is a pillar shaped stone, approximately 2.3m in height.
- Donegal Castle is a castle from the 15th century approximately 15km South of the Site in Donegal town. It fell into ruin in the twentieth century and was restored in the 1990s.

4.3.10 Property Values

The Subject Development is not visible from outside the Site and has not significantly altered the land use of the Site, i.e. commercial forestry, agriculture, and the partially constructed Meenbog Windfarm. It is therefore a reasonable assumption that the Subject Development has not and will not impact on the property values in the area.

4.3.11 Residential Amenity

Residential amenity relates to the human experience of one'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 setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced in the residence.

The Subject Development is located within a rural setting in East Donegal approximately 8km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12km northeast of Donegal Town. The N15 National Road runs northeast-southwest along the western boundary of the Site. Land use currently

comprises a mix of pastoral agriculture and commercial forestry, within the Site boundary. The surrounding land use predominantly comprises pastoral agriculture and forestry, with limited commercial and residential use along local roads and within towns to the north and south. Access is via existing entrances that were upgraded under the construction of the Meenbog Windfarm.

The distance between the work areas and the closest receptor is noted as 500m. Receptor H257 appeared vacant during the site visit in December 2023. The closest non-vacant receptor property was noted at approximately 550m. The construction phase, which could have had an effect on residential amenity is now complete with no significant effects recorded. Post construction there is no potential for effects on residential amenity.

When considering the amenity of residents in the context of the Subject Development, there are two main potential impacts of relevance: 1) Noise and Vibration, and 2) Visual Amenity. Noise is quantifiable aspects of residential amenity while visual amenity is more subjective. A detailed Noise impact assessment has been completed as part of this rEIAR (Chapter 9 addresses noise and vibration). A comprehensive landscape and visual impact assessment has also been carried out, as presented in Chapter 11 of this rEIAR. Impacts on the local population during the construction, operational and decommissioning phases of the Subject Development are assessed in relation to each of these key topics and other environmental factors such as noise, traffic, and dust; see Impacts in Section 4.5 below and general disturbance (see Section 4.2.2 above). The impact on residential amenity is then derived from an overall judgement of the combination of impacts due to changes to land-use and visual amenity, noise, traffic, dust and general disturbance.

4.4 Baseline Environment- Health

4.4.1 Introduction

As set out in the Department of Housing, Planning, Community and Local Government 'Key Issues Consultation Paper on the Transposition of the EIA Directive 2017' and the guidance listed in Chapter 1: Introduction, the consideration of the effects on populations and on human health should focus on health issues and environmental hazards arising from the other environmental factors, for example water contamination, air pollution, noise, accidents, disasters.

4.4.2 Baseline

Table 4-9 below details the general health of persons by percentage for the State, County Donegal and the Population Study Area for the most recent census taken in Ireland, 2016 and 2022, which have data publicly available. In general, the percentage health breakdown for the State, County and Study Area populations are very similar. The Population Study Area, State and County all reported in the range of 80-90% for a combined 'very good' and 'good' health. People living in the Population Study Area reported a decline in very good health and an increase in good health between 2016 and 2022. In 2022, 82.8% of people in Donegal stated that their health was good or very good compared with 85.6% in 2016. This is a similar trend to the national figures, which also showed a 4% decrease in the good/very good categories, from 87% to 83%.

Table 4-9 Percentage General Health Breakdown for the State, County Donegal and Population Study Area as reported in the 2016 and 2022 Census. Source www. CSO.ie

	Very Good		Good		Fair		Bad		Very Bad		Not Stated	
	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022
State	59.4 %	53.2 %	27.6 %	29.7 %	8%	8.6%	1.3 %	1.4 %	0.3 %	0.3 %	3.3 %	6.7 %
Donegal	56.7 %	51.7 %	28.9 %	31%	9.8 %	10.6 %	1.5 %	1.6	0.3 %	0.4 %	2.8 %	4.6 %
Population Study Area	60.2 %	52.9 %	26.9 %	32%	8.9 %	9.7	2.4 %	1.7 %	0.3 %	0.6 %	1.3 %	3.1 %

4.4.2.1 Air Quality

4.4.2.1.1 Dust, NO_2, PM_{10} and PM_{25} and CO_2 Emissions

Chapter 8 Air and Climate assess the potential for impact to human health from dust, CO_2 and other noxious emissions generated by additional vehicles and plant machinery as well as the release of CO_2 through excavations. The development is not one to generate odour that could be a nuisance to receptor locations. The assessments consider the construction, operation and decommissioning phases. The assessments conclude that the residual effects from the construction, operational and decommissioning phases of the Subject Development are not significant. Please see Chapter 8 for further details.

4.4.2.2 Water quality

There are no underground water or sewerage networks within the Site.

Regarding groundwater resources, the Geographical Survey Ireland do not map the presence of any National Federation registered Group Water Schemes (GWS) or Public Water Schemes (PWS) or an associated Source Protection Area (SPA) within the Site or in the surrounding lands. A search of private well locations (accuracy of 1 – 50m only) was undertaken using the GSI well database (www.gsi.ie). The GSI database does not record any wells in the vicinity of the Site. The closest mapped groundwater wells are located ~2km northeast of the t Site and are reported as having a poor yield class.,

Regarding Surface Water Quality, there are no mapped Drinking Water Protected Areas (DWPA) within or immediately downstream of the Site. The closest DWPA is Lough Mourne located upstream of the Site. However, Donegal Council abstract water from the Bunadaowen River within the site and pump it to Lough Mourne Reservoir, ~1.7km to the north. In the Donegal Bay North Catchment, the Eske_020 SWB upstream of Donegal Town and downstream of Lough Eske is listed as a DWPA. This is described in detail in Chapter 7 Hydrology and Hydrogeology

4.4.2.3 Noise and Vibration

Chapter 9 Noise and Vibration assesses the potential for noise and vibration impacts during the construction, operation and decommissioning phases of the Subject Development. The assessment includes mitigation and monitoring measures that were complied with for the construction, and also addresses the operational and decommissioning phases.

4.4.2.4 Traffic and Transport

Chapter 12 Material Assets assesses the potential for traffic and transport impacts during the construction phase and also addresses the operational and decommissioning phases. The Subject Development did not result in any additional traffic volume beyond those assessed in the EIAR for the Permitted Development.

4.4.2.5 Vulnerability of the Subject Development to/from Major Accidents and Natural Disasters

A wind farm is not a recognised source of pollution. Should a major accident or natural disaster occur the potential sources of pollution onsite during all phases of development are limited. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects on health, such as bulk storage of hydrocarbons or chemicals, storage of wastes etc. are limited.

There is limited potential for significant natural disasters to occur at the Site. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited to peat slippage, flooding and fire. The risk of flooding is addressed in Chapter 7: Hydrology and Hydrogeology. It is considered that the risk of significant fire occurring, affecting the Subject Development and causing it to have significant environmental effects is limited and therefore a significant effect on human health is similarly limited and the potential effect is considered imperceptible. As described earlier, there are no significant sources of pollution associated with the Subject Development with the potential to cause environmental or health effects.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Site is not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e. SEVESO sites and so there are no potential effects from this source.

Incidences of peat instability occurred on the site during the construction of the Meenbog Wind Farm. No peatslides were caused by the Subject Development Site inspections following the November 2020 peat slide concluded that all infrastructure, including the Subject Development, is stable (please see Chapter 6 for details).Therefore, it is considered that the risk of a peatslide occurring in the future, affecting or caused by the Subject Development and causing associated significant environmental effects is limited and therefore a significant effect on human health is similarly limited and the potential effect is considered imperceptible. Further details on the risk of instability and potential failures, particularly landslides, are discussed in Chapter 6 on Land, Soils, and Geology.

An assessment of the Subject Development's vulnerability to and from major accidents and/or natural disasters can be found in Chapter 13 Major Accidents and Natural Disasters of this rEIAR.

4.4.2.6 Health Baseline Summary

Chapter 6: Land, Soils and Geology, Chapter 7: Hydrology, Chapter 8: Air and Climate, Chapter 9: Noise and Vibration, Chapter 10 Archaeological and cultural heritage, Chapter 11 Landscape and Visual and Chapter 12: Material Assets provide an assessment of the effects the Subject Development may have had on these areas of consideration. Chapter 13 assesses the Subject Development's vulnerability to and from major accidents and/ or natural disasters. There was the potential for negative effects on human health during the Subject Development construction related to potential emissions to air of dust, potential emissions to land and water of hydrocarbons, release of potentially silt-laden runoff into watercourses and noise emissions. The assessments in the chapters listed above show that the residual effects did not lead to significant effects on any environmental media with the potential to lead to health effects for humans.

On the basis of the foregoing, the potential for negative health effects associated with the Subject Development during all phases is considered to be not significant.

4.5 Likely Significant Effects and Associated Mitigation Measures

The below assessment evaluates the impact (where there is the potential for an impact to occur) on population, employment levels, land-use, tourism, residential amenity and human health during the construction, operation and decommissioning phases of the Subject Development.

4.5.1 'Do-Nothing' Scenario

The "Do Nothing" alternative in the context of this Substitute Consent Application is to have built the Permitted Development strictly in accordance with the plans and particulars lodged with the planning application which would be an overly restrictive and impractical approach to the construction of a project of this nature and scale.

Under the Do Nothing alternative the opportunity to optimise construction of the windfarm in response to on-site conditions would have been lost and the design team would not have had the opportunity to react appropriately to real life conditions encountered during construction.

There would have been a greater potential for effects on health and safety due to the use of the unsafe Horseshoe bend at the site entrance.

4.5.2 Construction Phase

4.5.2.1 Population

4.5.2.1.1 *Population Levels*

Those who worked on the construction phase of the Subject Development were employed to construct the Permitted Development and travelled daily to the Site from the wider area. The construction phase had no impact on the population of the area in terms of changes to population trends or density, household size or age structure.

4.5.2.1.2 *Employment and Investment*

Pre-Mitigation Impacts

As part of the Meenbog Windfarm, the design and construction of the Subject Development provided employment for technical consultants and contractors. The construction of the Meenbog Windfarm employed approximately 80 workers over a twelve-month period.

The construction of the Meenbog Windfarm had a short-term moderate positive effect on employment and investment.

4.5.2.1.3 *Land Use Patterns & Activities*

Pre-Mitigation Impacts

Land use preconstruction in the Site comprised of ongoing agricultural and forestry practices. Current land use in the wider landscape comprises of forestry, agricultural practices and residential/ commercial activities.

The construction of the Subject Development did not have an impact on agricultural, residential and commercial land use in the area. The existing land-uses of agriculture and forestry have continued on the

Site t. Construction of the Subject Development resulted in a temporary imperceptible neutral effect on forestry practices within the Site during the construction phase.

Residual Impact

Due to the small footprint of the Subject Development, on a Site scale and even more so on a local scale, the residual effect is considered to have been permanent, imperceptible and negative on land use and direct, imperceptible temporary negative impact on forestry activities.

Significance of Effects

The effect on land use/activities due to the construction phase the Subject Development were not significant.

4.5.2.1.4 *Tourism*

Given that there are currently no tourism attractions specifically pertaining to the Site there were no direct impacts on tourism associated with the construction phase of the Subject Development.

With regard to tourist attractions and amenity use surrounding the Site, described in Section 4.3.9, traffic management safety measures were put in place during the construction phase, where required. The Subject Development did not result in any additional traffic volume beyond those assessed in the EIAR for the Permitted Development. The Subject Development had no effect on tourism in the surrounding area.

4.5.2.1.5 *Residential Amenity*

The potential for impacts on residential amenity is discussed in Section 4.3.11 above. There was the potential for impacts on residential amenity during the construction phase of the Subject Development from air, traffic, noise and vibration emissions due to additional traffic and plant machinery. The construction phase is now complete and as such, there is no pathway for effect between environmental media such as water abstraction and the Subject Development. Any visual effects were localised to the site. There was no effect from visual amenity on residential amenity. The Subject Development did not generate any additional traffic and therefore there was no traffic effect on residential amenity. air emissions were localised to the construction works and imperceptible at most, with noise and vibration, as detailed in Chapter 9 of this rEIAR not significant to impact on residential amenity. Given the small scale of the works involved in the Subject Development and the remote character of the construction works and site, there was no impact on residential amenity.

4.5.2.2 Health

The following impact assessment is produced in accordance with the IEMA Health impact assessment sensitivity, magnitude and EIA significance tables reproduced as Tables 4-1 to 4-4 above in section 4.3.

4.5.2.2.1 *Health and Safety*

Pre-Mitigation Impacts

Construction of the Subject Development necessitated the presence of a construction site and travel on the local public road network to and from the Site. Construction sites and the machinery used on them pose a potential health and safety hazard to construction workers if site rules are not properly implemented. This could have had in a worst-case scenario, potential significant permanent negative impact on health and safety. During construction of the Subject Development, there were 2nr. HAS site inspections, the first on the 11 June 2020 and the second on the 18 November 2020. There were no reportable accidents during the construction phase. Therefore, the construction phase of the Subject Development had no impact on

health and safety. For the sake of clarity, mitigation measures relating to Health and Safety are outlined below.

Mitigation and Monitoring Measures

The Subject Development was constructed, and will be operated and decommissioned as part of the Permitted Development in accordance with all relevant Health and Safety Legislation, including:

- Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005);
- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016);
- Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006
- Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).

These regulations and guidelines were followed on Site and no reportable accidents occurred during the construction phase of the Subject Development.

Residual Impact

There was no residual impact on health and safety as there were no reportable accidents during the construction phase of the Meenbog Windfarm.

Significance of Effects

There was no significant effect on health and safety.

4.5.2.2.2 *Air Quality: Dust, NO_2, PM_{10} and PM_{25} and Co2 Emissions*

Pre-Mitigation Impacts

Potential dust and exhaust emission sources during the construction phase of the Subject Development included upgrading of existing access tracks and construction of new access roads, borrow pits, peat storage cells and temporary construction compounds.

Potential dust and exhaust emissions sources during the construction phase of the Subject Development included construction works and vehicle and plant movements. An increase in dust emissions had the potential to cause a nuisance to receptor in the immediate vicinity of the site. The closest receptor was at 500m to the Subject Development construction works. Furthermore, the entry and exit of staff vehicles and heavy machinery had the potential to result in the transfer of mud to the public road, particularly when the weather was wet. This in turn had the potential to cause nuisance to residents and other road users by generating dust as it dried. However, these impacts would not be significant and would be relatively short-term in duration. Additional potential dust and exhaust emissions sources during construction phase of the project included Light Goods Vehicles ferrying staff and light machinery used for the construction Subject Development within the site. An increase in dust emissions had the potential to cause nuisance on sensitive receptors in the immediate vicinity of the site. The potential dust impacts that may occur during the restoration phase are further described in Chapter 8: Air and Climate of this rEIAR.

Mitigation Measures

The following mitigation measures were implemented during the construction of the Subject Development. Please refer to Chapter 15 Schedule of Mitigation and Monitoring Measures for a full list of measures.

Aggregate material for the construction of roads and turbine bases was sourced onsite; therefore there was no need to transport this material to the site. Truck wheels where washed where necessary to remove mud and dirt before leaving the site. All plant and materials vehicles were stored in the dedicated compound

area. Areas of excavation were kept to a minimum, and stockpiling was minimised by coordinating excavation, spreading and compaction.

Construction traffic was restricted to defined routes and a speed limit was implemented. In periods of extended dry weather, dust suppression was implemented where necessary along haul roads and around the borrow pit areas to ensure dust did not cause a nuisance. Where necessary, water was taken from the site's drainage system, and was pumped into a bowser or water spreader to dampen down haul roads and the temporary site compound to prevent the generation of dust. Silty or oily water was not used for dust suppression, because this would have transferred the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements were carefully monitored, as the application of too much water may have led to increased runoff.

Residual Impacts

With the implementation of the above measures for the construction phase, residual impacts on air quality from exhaust emissions and dust associated with construction activities and machinery are considered to have been local, short-term, imperceptible and negative.

Significance of Effects

There were no significant effects on air quality from dust or exhaust emissions during the construction phase of the Subject Development.

4.5.2.2.3 *Water Quality*

Pre-Mitigation Impacts

There are no underground water or sewerage networks within the Site. As discussed in Section 4.4.2, there are no groundwater, GWS, PWs or SPAs within the Subject Development Site and the GSI does not record any wells in the vicinity of the Site.

Regarding Surface Water Quality, there are also no mapped DWPA (DWPA) within or immediately downstream of the Site. The closest DWPA is Lough Mourne located upstream of the Site, and Donegal County Council abstracts water from the Bunadaowen River within the Site and pump it to Lough Mourne Reservoir, ~1.7km to the north. In a worst-case scenario, there was potential for a short term moderate negative impact on local water supplies from sediment entrainment or potential hydrocarbon leakage from construction machinery or plant. However, with the construction phase complete, no incidents were reported that would have impacted on local water supplies and no further effects arer anticipated post xconstruction as the Subject Development is stable and safe from a Health and Safety perspective.

Mitigation and Monitoring Measures

A bespoke drainage design which included interceptor drains, check dams, swales and ponds, was implemented at the Site.

Chapter 7 details all best practise and mitigation measures that were utilised to minimise the potential for entrainment of suspended sediment or potential hydrocarbon leak. Please see chapter 7 for details and Chapter 15 for a full list of Mitigation and Monitoring measures employed for the Subject Development.

Residual Impact

With the implementation of the drainage design and all mitigation measures listed in chapter 7 Hydrology and Hydrogeology (separation distances, and prevailing geology, topography and groundwater flow directions), and the construction phase now complete., there were no significant effects on water quality.

Significance of Effects

There were no significant effects on water quality during the construction phase of the Subject Development

4.5.2.2.4 *Noise and Vibration*

Pre-Mitigation Impacts

There was at worst, a not significant to slight increase in noise levels in the immediate vicinity of the Site during the construction phase of the Subject Development, as a result of heavy machinery and construction work which had the potential to cause a nuisance to receptor locations located closest the Site This effect was not significant. Construction noise at any given receptor l were variable throughout the construction project, depending on the activities underway and the distance from the main construction activities to the receiving properties. The potential noise impacts that occurred during the construction phase of the Subject Development are further described in Chapter 9: Noise and Vibration.

The Noise and Vibration assessment concludes that during construction, the Subject Development gave rise to noise emissions which were at worst, as negative, not significant to slight and temporary. It follows that the Subject Development did not give rise to adverse effects on the local population or on human health. A series of mitigation measures to reduce any impact is provided below.

Mitigation and Monitoring Measures

Best practice measures for noise control as set out in the CEMP (Appendix 3-2) were adhered to on Site during the construction phase of the Subject Development. Please refer to Chapter 15 Schedule of Mitigation and Monitoring Measures for a full list of measures.

- Sensitive location of equipment, taking account of local topography and natural screening.
- Working methods: construction noise was controlled by prescribing that standard construction work was restricted to the specified working hours. Any construction work carried out outside of these hours was restricted to activities that did not generate noise of a level that may cause a nuisance. The phasing of works was also been designed with regard to avoidance of noise impacts.
- Plant was selected taking account of the characteristics of noise emissions from each item. All plant and machinery used on the site complied with relevant E.U. and Irish legislation in relation to noise emissions.
- The timing of on- and off-site movements of plant near occupied properties was controlled.
- Operation of plant: all construction operations complied with guidelines set out in British Standard documents 'BS 5338: Code of Practice for Noise Control on Construction and Demolition Sites' and 'BS5228-1:2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites'.
- The correct fitting and proper maintenance of silencers and/or enclosures, the avoidance of excessive and unnecessary revving of vehicle engines, and the parking of equipment in locations that avoid possible impacts on noisesensitive locations was employed.
- Training and supervision of operatives in proper techniques to reduce site noise, and self-monitoring of noise levels, where appropriate.

Residual Impact

With the implementation of the above mitigation measures, there was a short-term, imperceptible negative effect on health due to a negative, not significant to slight and temporary effect on noise levels during the construction phase of the Subject Development.

Significance of Effects

For the reasons outlined above, the effects on human health due to noise emissions from the Subject Development during construction were not significant.

4.5.2.2.5 *Traffic and Transport*

The construction of the Subject Development did not result in any additional construction traffic beyond that which was associated with the construction of the Permitted Development. Therefore, the Subject Development had no effect on traffic and transport or road users.

4.5.2.2.6 *Major Accidents and Natural Disasters*

As discussed in Section 4.4.2.5 the greatest potential for environmental effects associated with major accidents and natural disasters during the construction phase of the Subject Development related to the risk of peat instability. There was potential for major accidents or natural disasters to occur to have a significant effect on human health and safety. No major accident or natural disaster was caused by the Subject Development.

There were no major accidents or natural disasters associated with the construction of the Subject Development and therefore there was no effect on Population or Human Health during the construction phase. No natural disasters or major accidents occurred because of the Subject Development and no injuries to staff or members of the public was recorded on Site.

4.5.3 Operational Phase

There will be no additional effects on Population levels, employment and investment, property values, tourism, residential amenity or noise and vibration in the post construction phase of the Subject Development. If granted substitute consent, the Subject Development will become an integrated part of the Meenbog Windfarm. Overall, the Subject Development will not have any material effects on Population and Human Health during the operational phase.

4.5.4 Decommissioning Phase

Wind turbines as part of the Permitted Development are expected to have an operational lifetime of 30 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Site may be decommissioned. In the event that the Meenbog Windfarm is decommissioned, the Subject Development would be subject to any decommissioning plan for the Meenbog Windfarm and will not alter the decommissioning phase as assessed in the EIAR for the Permitted Development. The majority of the Subject Development will likely be left in situ. Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurred during the construction phase, however to a lesser extent and lesser duration.

4.5.5 Cumulative and in-combination Effects

For the assessment of cumulative impacts, the Permitted Development, November 2020 Peatslide and consequent remediation works, and any other relevant existing, permitted or proposed developments (wind energy or otherwise) have been considered where they had the potential to generate an in-combination or cumulative impact with the Subject Development. Further information on the developments, plans and projects considered as part of the cumulative assessment are given in Section 2.7 of this rEIAR.

The potential cumulative impact of the Subject Development and other relevant plans and projects has been carried out with the purpose of identifying what influence the Subject Development has had or will have on the surrounding environment when considered cumulatively and in combination with relevant plans and projects.

Further information on projects and plans considered as part of the cumulative assessment are given in Chapter 2: Background to the Subject Development. The impacts with the potential to have cumulative effects on Population and Human Health are discussed below.

4.5.5.1 Employment and Economic Activity

While there was no effect on employment and economic activity directly related to the construction of the Subject Development, the construction of the Meenbog Windfarm has contributed, and will continue to contribute to short term employment during the construction stage. Once completed the Meenbog Windfarm will provide the potential for long-term employment resulting from maintenance operations.

4.5.5.2 Tourism

The Subject Development has had, and will have, no effect on Tourism. Therefore, there is no potential for cumulative impacts on tourism when considered in combination with the Permitted Development, the 2020 peat slide or other plans and projects.

4.5.5.3 Health and Safety

There were no reportable accidents during the construction phase of the Subject Development or the Permitted Development, therefore there were no cumulative effects on Health and Safety during the construction phase. The November 2020 peat slide had the potential to result in negative health and safety outcomes, however there were no injuries or accidents reported associated with this event and therefore there was no cumulative effect on health and safety.

Neither the Subject Development nor the Permitted Development will have any impacts in terms of health and safety during the operational phase.

4.5.5.4 Residential Amenity

The Subject Development was constructed at the same time and the Permitted Development. This had the potential to result in short term, imperceptible, negative effects on residential amenity, in relation to noise and vibration and dust. Mitigation measures as outlined under noise and vibration, dust, traffic, and visual amenity in this rEIAR were implemented in order to reduce insofar as possible impacts on residential amenity at properties located in the vicinity of the Subject Development works. In addition, all mitigation measures outlined in the CEMP for the Permitted Development were also implemented.

The Subject Development had no effect on residential amenity during construction works. During the operational phase there will be no residual impact on residential amenity resulting from the Subject Development. Therefore, there is no potential for cumulative effects on residential amenity.