

13 MATERIAL ASSETS AND OTHER ISSUES

13.1 INTRODUCTION

This chapter assesses the likely significant effects of the Proposed Development on material assets. The Proposed Development refers to all elements of the application for the construction of Tirawley Wind Farm (**Chapter 2: Development Description**). The assessment will consider the potential effects during the following phases of the Proposed Development:

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

As outlined in **Chapter 2: Project Description**, permission is being sought by the Developer for the construction of 18 no. wind turbines, a 1 no. permanent Met Mast, Battery Energy Storage System (BESS), an Onsite Substation and all ancillary works. Three possible Turbine Delivery Route's (TDRs) have been assessed with a particular focus on the final leg of the TDR between the Wind Farm Site and the northern part of Ballina town Co. Mayo. One preferred Grid Route Connection (GCR) option has been assessed as part of the Proposed Developments EIAR. The preferred GCR connects to the national grid via an underground cable connection from the Onsite Substation to the Tawnaghmore 110 kV Substation located in Killala Business Park. A second connection option considered in this EIAR is a 110 kV underground Interconnector cable between the Proposed Development (Tirawley Wind Farm) and a Proposed Hydrogen Plant known as the Killala Energy Hub, granted by Mayo County Council on the 27/05/2025 (Panning Reference No. 2360266). Both connections follow the same cable route from the Wind Farm Site to the townland of Tawnaghmore Lower, where the existing EirGrid 110 kV substation and the Proposed Killala Energy Hub are located.

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**. This chapter of the EIAR is supported by Figures provided in **Volume III** and by the following Appendix documents provided in Volume IV of this EIAR:

- **Appendix 13.1 Forestry Report**

13.2 STATEMENT OF AUTHORITY

Jennings O'Donovan & Partners Ltd. (JOD) have extensive experience in all aspects of wind farm development, from design and planning stages through to construction. JOD have been active as engineering consultants in the wind energy market in Ireland since 1998 and have completed numerous wind farm projects, varying from single wind turbine

installations to largescale, multi-turbine developments with a total of over 2,000 MW generation capacity.

This Chapter has been prepared by Mr. Darren Timlin of Jennings O'Donovan & Partners Limited. The Forestry Report (**Appendix 13.1**) was carried out by Joe Martin Murohy in Veon Limited.

Mr. Darren Timlin is a Graduate Environmental Scientist and holds a Bachelor (Hons.) Degree in Environmental Science from the Atlantic Technological University. Darren has 3 years' experience drafting EIAR's and Screening Reports, Appropriate Assessments for Wind Farms, Hydrogen Plants and Power Generation Plants. He forms part of the Environmental team responsible for preparing the EIAR Chapters. Darren has experience drafting EIAR's and Screening Reports, Appropriate Assessments for Wind Farms, Hydrogen Plants and Power Generation Plants. He has experience in the use of Arc GIS Pro and Auto CAD 2D.

Mr. Martin Murphy holds a BSc (Hons) in Land Management in Forestry from Waterford Institute of Technology and a MSc (Agr) from University College Dublin and is a member of the Society of Irish Foresters. Since joining Veon in 2023, Martin has gained valuable experience in forestry, including licencing and wind farm development projects. His experience is wide ranging and includes most aspects of forestry; from establishment to harvesting, including wind and solar and wind farm consultation, forest valuation, tree surveys, plantation purchasing, forest roading, woodland improvement and consultancy services. Joe is Project Supervisor Construction Stage (PSCS) approved.

Detailed biographies/CVs of those of those who contributed to the preparation of this EIAR have been included in **Appendix 1.1: Author Qualifications**.

13.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Following preliminary consultations with key consultees (**Section 1.11** of **Chapter 1: Introduction** and in **Appendix 1.3** of this EIAR) during the scoping process, desk-based assessments, site visits and field surveys were undertaken. In line with the EIA Directive 2011/92/EU as amended by EIA Directive 2014/52/EU and current EPA Guidelines, this chapter of the EIAR aims to focus the assessment solely on those elements likely to have a significant effect on the environment. Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are addressed in **Chapter 8: Soils and Geology**, **Chapter 9: Hydrology and Hydrogeology**, and **Chapter 10: Air and Climate**. Peat and spoil are

assessed in **Chapter 8: Soils and Geology**. Amenity resources and tourism are addressed in **Chapter 5: Population and Human Health**. The cultural assets of Archaeology and Cultural Heritage are addressed in **Chapter 14: Cultural Heritage** and traffic is addressed in **Chapter 17: Traffic and Transportation**. Utilities such as water, wastewater and waste services are addressed in this chapter and in **Chapter 2: Development Description**.

In line with the revised EIA Directive and current EPA guidelines listed in **Chapter 1, Section 1.6** the structure of this Materials Assets chapter is as follows:

- Description of Baseline conditions at the Wind Farm Site
- Do Nothing Effect Assessment;
- Identification and assessment of effects to Materials Assets associated with the Proposed Development during the construction, operational and decommissioning phases of the Proposed Development
- Mitigation measures to avoid or reduce the effects identified
- Identification and assessment of residual effect of the Proposed Development considering mitigation measures, and
- Identification and assessment of cumulative effects if and where applicable.

The material assets considered in this Chapter include:

- Land Use - Agriculture
- Land Use - Forestry
- Telecommunications
- Air Navigation
- Quarries
- Utilities (gas, water, waste)

13.3.1 Evaluation of Potential Effects

Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential effects likely to affect identified material assets as a result of the Proposed Development.

The statutory criteria (EPA, 2002; EPA, 2003) for the assessment of effects require that likely effects are described with respect to their extent, magnitude, type (i.e. negative, positive or neutral) probability, duration, frequency, reversibility, and transboundary nature (if applicable). The descriptors used in this Environmental Impact Assessment Report

(EIAR) are those set out in EPA (2002) 'Glossary of Impacts' and shown in **Chapter 1: Introduction, Table 1.4.**

Effects may be categorised as follows:

- Direct: where the existing traffic and transport environment in proximity to the Proposed Development is altered, in whole or in part.
- Indirect: where the traffic and transport environment beyond the Proposed Development is altered by activities related to the construction or operation of the Proposed Development.
- No Effect: where the Proposed Development has neither negative nor positive effect upon the traffic and transport environment.

13.4 LAND USE - AGRICULTURE

13.4.1 Baseline Environment

The Wind Farm Site is located ~14.5 km northwest of Ballina Town, ~5.2 km northwest of the village of Killala and ~2.4 km east of Ballycastle village in north Co. Mayo. The Wind Farm Site is located ~10.5 km east of the county border between Mayo and Sligo. The Wind Farm Site has a total area of ~119.12 ha.

Topography across the Wind Farm Site is variable, ranging from ~20 to 155 metres above Ordnance Datum (mOD). The north and center of the Wind Farm Site are located on elevated ground. The greatest elevations are found in the north of the Wind Farm Site, which is situated on the southeastern slopes of Knockboha Hill, which stands at an elevation of ~186 mOD. There are also several other local high points further to the south which range in elevation from ~108 to 134 mOD. The southern section of the Wind Farm Site is located on lower ground with topography sloping gently to the southeast towards Cloonaghmore Estuary and Killala Bay. In terms of the Proposed Development infrastructure, a total of 10 no. turbines are located at elevations in excess of 100 mOD. These turbines are largely situated towards the north and centre of the Wind Farm Site. Further to the south, 8 no. turbines, the Battery Energy Storage System (BESS) and the proposed substation location are located on lower ground with elevations less than 100 mOD.

The Wind Farm Site is comprised of peat bog, coniferous forestry, transitional woodland scrub and agricultural pastures. Much of the lands are in private, third-party ownership, while a portion of the site is shared land (commonage). Land cover at the Wind Farm Site is mapped by Corine (2018) as inland wetland peat bogs, with some smaller areas of coniferous forestry, semi natural areas and agricultural pastures (www.epa.ie). No

significant land use changes have been recorded by historic Corine mapping (1990-2018). The Wind Farm Site is comprised of agricultural pastures with fields typically separated by hedgerows and stone walls. Local pockets of coniferous forestry and peat bogs are also located within the Wind Farm Site. The commercial forestry is mainly made up of Sitka Spruce and Japanese Larch and is further detailed in **Section 13.5**.

13.4.2 Assessment of Potential Effects

The total permeant land take of the Wind Farm Site, including the Site Access Tracks, Turbine Hardstands, Turbine Foundations, Permanent Operations Compound, Met Mast Hardstands, sub-station and public roads within the Wind Farm Site is approximately 9.93 ha. The Wind Farm Site has an area of 119.12 ha therefore the total land take is 8.34 % of the Wind Farm Site. The immediate surrounding agricultural grasslands will remain in agricultural use.

Temporary land take areas within the Wind Farm Site will be 18,502 m² (1.85 ha) not including the GCR. Therefore, the total temporary land take is 1.55 % of the Wind Farm Site.

The overall length of preferred GCR is 13.55 km of which 12.43 km is located along the public road corridor and 1.12 km is located within the Killala Business Park grounds. The GCR will involve works on a total area of c. 8,130 m² of which c. 7,458 m² is located on public roads, to be reinstated following the laying of the ducts and so is classed as temporary land take.

Minor temporary works (removal of street furniture, traffic Island works or hedgerow trimming) will be required along the TDR (outside the Redline Boundary) to accommodate the delivery of the turbine components and HGV vehicles as far as the Site Entrance.

Other works along the TDR will be temporary and confined within the Redline Boundary. The TDR and Construction Haul Routes (CHR) will utilise site entrances 1-15. Works will include the removal of existing vegetation for visibility splays and widening to facilitate the use of each entrance for the delivery of construction materials and turbines to the Wind Farm Site. Additionally, approximately 2.82 km of existing public roads along the TDR require widening. No excavation or enabling works are envisaged in private lands outside of the Redline Boundary. Full reinstatement will occur where such excavation or enabling works are undertaken.

The proposed Site Access Tracks and upgrade to existing roads will improve access for surrounding agricultural use.

The construction, operational and decommissioning phase of the Proposed Development will result in a change of approximately 15.68 hectares of agricultural land use in area, to facilitate new Site Access Tracks, Onsite Substation, BESS, civil works and Turbine Hardstands.

There will be 7 no. turbines located on or partly on agricultural lands. This will result in the change of use from agricultural use to windfarm use. This will have a long-term, slight, negative effect on agricultural land use due to the removal of grazing lands for the duration of the Proposed Development during construction and operation phases.

The approach proposed for decommissioning is one of minimal intervention:

- Decommissioning works will be limited to action necessary to remove the windfarm structures, i.e., removal of turbines and monitoring masts, BESS and extraction of cables but leaving ducting in-situ
- Site Access Tracks and associated drainage systems will remain in place to serve ongoing forestry and agriculture activity
- Hardstanding areas will be allowed to revegetate naturally
- Turbine plinths will be removed, and the hardcore covering Turbine Foundations will be allowed to revegetate naturally
- Soil disturbance will be avoided as much as possible.

Therefore, the effects of the decommissioning phase on agriculture will be less than those during the construction phase but not significant i.e., long-term, not significant, negative effect.

13.4.3 The 'Do-Nothing' Effect

If the Proposed Development does not proceed, lands within the Redline Boundary of the Wind Farm Site will continue to be used for agricultural purposes. In this case, the likely evolution of the baseline environment may progress towards less optimal farming practices due to a reduction in soil fertility. Research from Teagasc¹ has shown that most

¹ Teagasc, 2023, Soil, Forests and Biochar, Available at: <https://www.teagasc.ie/news--events/daily/forestry/soil-forests-and-biochar.php> [Accessed 17/09/2025]

soils in Ireland have been degraded (both chemically and physically) and have reduced levels for pH, Phosphate and Phosphorous which may lead to a drop in farming practices over time. This may have a slight negative long-term effect.

13.4.4 Mitigation Measures

A process of “Mitigation by Avoidance” to avoid or minimise effects on agricultural land use has been incorporated into the design stage. The construction and operational footprint of the Project has been kept to the minimum necessary to avoid effects on existing land uses and existing roads and tracks serving agricultural use have been used where possible.

13.4.5 Residual Effects

Implementation of mitigation measures, outlined at the design stage will provide that residual effects on agricultural use will be slight, negative and temporary i.e. not significant, for the duration of the construction and negligible for the operational lifespan of the Proposed Development.

For decommissioning phase, the residual effect will be slight negative and temporary for the duration of the phase.

All existing access points (i.e., to domestic premises, business, farms) are accessible during temporary road closures and diversions. This is to maintain local access and avoid effects on other various land uses. **Chapter 17: Traffic and Transportation** refers to all proposed works and deliveries along the TDR to avoid undue effect to adjacent land uses. This is also considered for the decommissioning phase for which traffic will be required along the CHR. During the operational phase of the Proposed Development the TDR will no longer be needed except in such cases where a blade or other component may be required to be replaced. The turbine delivery and maintenance requirements process is further detailed in **Chapter 2: Development Description**. For the decommissioning phase, the TDR will no longer be needed. This is further detailed in **Chapter 2: Development Description**.

Thus, the residual effect on surrounding agricultural land uses is slight during construction and decommissioning and negligible during the operational phase.

13.4.6 Cumulative Effects

Due to the localised nature of the proposed construction, decommissioning works, there is no potential for significant cumulative effects in-combination with other local developments on the agricultural land use as all effects are directly within the Wind Farm Site.

Other projects outside the Wind Farm Site do not have the potential to reduce or increase the magnitude of effects of the Proposed Development on agricultural land use within the Wind Farm Site. Therefore, this will not contribute to any significant cumulative effects during the construction, decommissioning or operational phases.

Land management practices in the wider area which are considered to have potential for cumulative effects with the Proposed Development are primarily agriculture and forestry. All existing and approved projects in **Appendix 1.2** and **Appendix 1.5** were considered. Minor domestic and agricultural development will not introduce potential for cumulative effects during the construction, operational or decommissioning phases as the effects will be localised and not significant.

A proposed Hydrogen Plant known as the Killala Energy Hub was granted by Mayo County Council on the 27/05/2025 (Planning Reference No. 2360266). Both the proposed Tirawley Wind Farm and Killala Energy Hub Developments are in the control of the Developer. The Killala Energy Hub is located approximately 6.91 km southeast from the Wind Farm Site in the Killala Business Park. If developed the Killala Energy Hub will be constructed largely on an existing industrial land use. Therefore, this will not contribute to any significant cumulative effects during the construction, decommissioning or operational phases.

Major developments and proposed developments (bigger than one of houses) located within 10 km of the Wind Farm Site (**Appendix 1.5**) have been considered for their potential cumulative impact on agricultural land use in the wider area of the Proposed Development. No significant effects on agriculture have been identified.

The nearest wind farm is located 5.2 km to the south-east of the Proposed Development (Killala Wind Farm). Surrounding agricultural activities can and will continue during the construction, operational and decommissioning phases of the Proposed Development when fencing around the Wind Farm Site has been fully established.

13.4.7 Statement of Significance

No significant effects are predicted on agricultural land use within or outside of the Wind Farm Site.

13.5 LAND USE - FORESTRY

13.5.1 Baseline Environment and Description of Development

Permission is being sought by the Developer for the construction of 18 no. Wind Turbines, 1 No. meteorological masts, an onsite electrical substation, BESS, a permanent operation building and all ancillary works, works along the TDR and the construction of an underground GCR to the Tawnaghmore 110 kV substation, Killala Business Park, Co. Mayo. A full description of the Proposed Development can be found in **Chapter 2: Development Description**, and a full forestry report is available in **Appendix 13.1: Forestry Report**.

The proposed site area contains approximately 212 hectares of forestry, all of which is under private ownership and is being managed on a commercial basis. The proposed windfarm infrastructure layout affects forestry at 11 of the 18 planned turbine locations. Additionally, the Met Mast location and parts of the proposed Site Access Tracks overlap with forested areas. To facilitate the construction of the proposed wind farm at Tirawley, approximately 40.24 ha of existing forestry is due for infrastructure felling. A summary of the forestry affected is provided in **Table 13.1** (from **Appendix 13.1 Forestry Report**).

Table 13.1: Summary of Removal of Forestry to facilitate the Proposed Development

Infrastructure	Area of forestry lost (ha)	Species present
AT01	-	-
AT02 (incl. Site Access Tracks)	2.91	SS, JL, BI
AT03 (incl. Site Access Tracks)	5.15	SS, JL
AT04 (incl. Site Access Tracks)	4.21	SS, JL
AT05	-	-
AT06	1.58	SS, JL
AT07 (incl. Site Access Tracks)	4.35	SS, JL
AT08 (incl. Site Access Tracks)	4.03	SS, JL
AT09	-	-
AT10 Access Track Only	0.28	SS, JL, BI
AT11 (incl. Site Access Tracks)	3.44	SS, JL, Ash, ALD
AT12 (incl. Site Access Tracks)	2.93	SS, JL, ADB
AT13	1.79	SS, JL
AT14 (incl. Site Access Tracks)	3.08	SS, JL
AT15	-	-

Infrastructure	Area of forestry lost (ha)	Species present
AT16	-	-
AT17 (incl. Site Access Tracks)	3.46	SS, LP
AT18	-	-
Met Mast (incl. Site Access Tracks)	2.78	SS, JL, BI
Public road widening	0.25	Ash, ALD, SS, JL
Total	40.24	

Detailed consideration of the approach to afforestation requirements associated with the Proposed Development is attached in **Appendix 13.1: Forestry Report**. It should be noted that the clear felling of trees in the State requires a felling licence. The associated afforestation of alternative lands equivalent in area to those lands being permanently clear felled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. In light of the foregoing and for the purposes of this Proposed Development, the Developer commits that the location of any replanting (alternative afforestation) associated with the Proposed Development will be greater than 10 km from the Wind Farm Site and also outside any potential hydrological pathways of connectivity i.e., outside the catchment within which the Proposed Development is located. This is further detailed in **Section 2.4.2 of Chapter 2: Development Description**.

On this basis, it is reasonable to conclude that there will be no more than imperceptible, indirect or in-combination effects associated with the replanting. In addition, the Developer commits to not commencing the Proposed Development until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

13.5.2 Assessment of Potential Effects

The lands affected by the Proposed Development are currently in use for commercial forestry, agriculture and boglands.

Arc GIS Pro was used to calculate areas of forestry within the surrounds of the Wind Farm Site. Within 2 km of the Wind Farm Site, there is approximately 891 ha of forestry. The

majority of the forestry within the surrounds of the Proposed Development was classed as 'Coniferous Forest' according to CORINE Land Cover (Copernicus)².

The removal of 40.24 hectares (4.5 %) of 891 hectares of forestry lands within 2 km of the Wind Farm Site will have a slight negative effect on the existing forestry land use during the construction, operation and decommissioning of the Proposed Development, both due to the direct loss of this land-use and the potential opportunity loss in not harvesting wood at full maturation.

13.5.3 The 'Do-Nothing' Effect

If the Proposed Development does not proceed, lands in the vicinity of the Wind Farm Site will continue to be used for forestry and agricultural purposes. In this case, the likely evolution of the baseline environment may progress towards a reduction in soil fertility. As outline in **Section 13.4.3**, research from Teagasc has shown that most soils in Ireland have been degraded and have reduced levels for pH, Phosphate and Phosphorous which may lead to less productive forestry. This may have a slight negative long-term effect. If soils remedial action is undertaken, the long-term effect may change.

13.5.4 Mitigation Measures Residual Effects

Existing forestry tracks have been incorporated into the design to minimise the construction of new Site Access Tracks and minimise the removal of forested areas. New Site Access Tracks have been sensitively designed to minimise effect on forestry. Electricity cables will be installed underground in or alongside Site Access Tracks to avoid and minimise negative effect. The construction and decommissioning works will be planned and managed by a Construction and Environmental Management Plan (CEMP) (**Appendix 2.1**). This provides details on day to day works and methodologies. As part of these works, the public and other stakeholders will be provided with updates on construction activities which will affect access to surrounding lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the construction period.

² Environmental Protection Agency Maps <https://gis.epa.ie/EPAMaps/> [Accessed Online 17/09/2025]

13.5.5 Residual Effects

The effect on land take during construction is likely to have a permanent moderate, effect on the forestry, in that it alters the character of the environment, albeit in a manner consistent with existing and emerging wind farm trends in the surrounding area.

During the operational phase, the effect on forestry land take is likely to have a moderate negative permanent effect on the environment of the area (in that it alters the character of the environment).

13.5.6 Cumulative Effects

Due to the localised nature of the proposed construction works which will be kept within the Redline Boundary, there is no potential for significant cumulative effects in-combination with other local developments on commercial forestry as all effects are directly within the Proposed Development site.

The surrounding commercial forested area of the Proposed Development will continue its ongoing commercial maintenance, felling and replanting schedule throughout the operational life of the Proposed Development.

As forestry activity is expected to continue on surrounding lands throughout the lifespan of this Proposed Development, no potential significant cumulative effects are considered likely.

13.5.7 Statement of Significance

No significant effects are predicted on commercial forestry outside of the Wind Farm Site.

13.6 TELECOMMUNICATIONS

Microwave is a line-of-sight wireless communication technology that uses high frequency beams of radio waves to provide high speed wireless connections. Microwave links need an unobstructed line of sight from end to end because blocked links will perform inadequately. It is therefore necessary to ensure tall wind turbines will not interrupt links. Effects can include reflection, diffraction, blocking and radio frequency interference.

During operation, wind turbines have the potential to interfere with electromagnetic signals passing above the ground due to the nature and size of the Wind Farm. For this reason, the potential effect of wind turbines on electromagnetic signals during the operational phase is assessed.

Ireland saw the roll out of Digital Terrestrial Television, locally known as Saorview TV, in October 2010, incorporating the switchover from analogue to digital television. According to Ofcom (a regulatory UK body) (2009), *digital television signals are much better at coping with signal reflections, and digital television pictures do not suffer from ghosting*³. Ghosting is the replica of a transmitted image which is offset in position and is superimposed on top of the main image.

Since digital switchover, there have been very few reported cases of wind turbine interference with domestic analogue reception. Modern turbine blades are also typically made of synthetic materials which have a minimal effect on the transmission of electromagnetic radiation. Therefore, potential effects on television and radio signals from the Proposed Development will be negligible and are not considered further, given the advancements in technology.

13.6.1 Guidance

Potential telecommunication effects generated by the Proposed Development have been assessed with reference to the following documents:

- Mayo County Development Plan, 2022 - 2028
- 'Best Practice Guidelines for the Irish Wind Energy Industry', published by the Irish Wind Energy Association (2012).
- Information about Electric & Magnetic Fields and the Electricity Transmission System in Ireland, EirGrid⁴
- Wind Energy Development Guidelines: Planning Guidelines, Department of Environment, Heritage and Local Government (DHPCLG) 2006⁵
- Draft Revised Wind Energy Development Guidelines, Department of Housing, Local Government and Heritage (2019)⁶

³ Ofcom (2009) *Tall Structures and Their Impact on Broadcast and Other Wireless Services*, OFCOM, United Kingdom. Available online at: https://www.ofcom.org.uk/__data/assets/pdf_file/0026/63494/tall_structures.pdf [Accessed 17/09/2025]

⁴ Eirgrid (2014) *Information on Electric and Magnetic Fields*. Available online at : <http://www.eirgridgroup.com/site-files/library/EirGrid/Information%20on%20Electric%20and%20Magnetic%20Fields.pdf> [Accessed on 17/09/2025]

⁵ Department of Housing, Planning, Community and Local Government (2006) *Planning Guidelines*. Available online at: <https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/> [Accessed 17/09/2025]

⁶ Department of Housing Local Government and Heritage (2019). Available at: <https://www.gov.ie/en/organisation/department-of-housing-local-government-and-heritage/> [Accessed 17/09/2025]

13.6.2 Scoping and Consultation

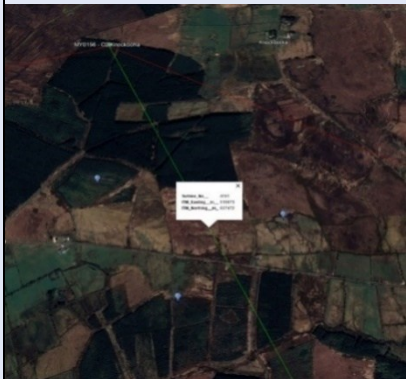
Telecommunications providers were consulted about the Proposed Development. A summary of responses is outlined in **Table 13.2** and **Appendix 1.3** outlines full consultation responses.

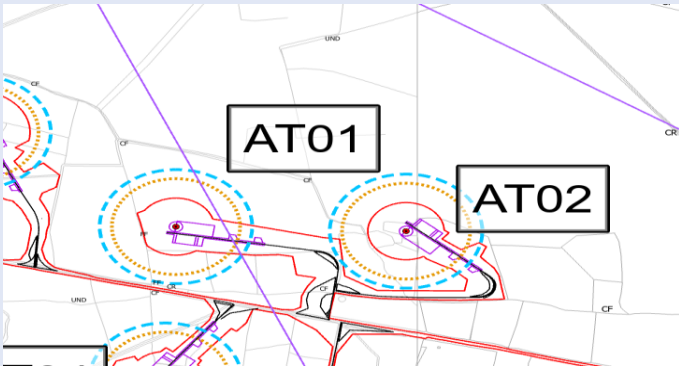
Table 13.2: Summary of Consultations

Consultee	Response Date	Response
Mayo County Council (MCC)	18/08/2023	<i>Pre-Planning Meeting 18th August 2023</i> <i>Introduction</i> <i>ID outlined that the purpose of the meeting was to brief MCC on the proposed windfarm, an SID application to ABP, and that ABP had requested Constant Energy to elicit the views of MCC on the proposal.</i> <i>The proposed development consists of 25 wind turbines, (96 MW). 21 turbines will have a 125m tip height and a 105m rotor diameter, generating up to 3.45 megawatts (MW), 4 turbines will have a tip height of 180m and a 150m rotor diameter, generating up to 6 MW, a 110Kv substation, an underground 110Kv powerline laid in/along public roads to the Ashai site in Killala.</i> <i>Drgs. Palmerstown Bridge Route Overview Map Tirawley Mayo Landscape Policy Tirawley Site Layout Map Downpatrick Head photomontage Haul routes Map for ABP Presentation.</i> <i>MCC Concerns</i> <i>Site Boundary: There appears to no single site boundary. The redline site boundary appears to be a series of groups of turbines & single turbines linked along the public road. The public roads cannot form part of the site boundary.</i> <i>Visual Impact: The site layout is in the form of dispersed turbines throughout the landscape and does not conform to the layouts identified in the Draft Revised Wind Energy Development Guidelines of 2019. The larger turbines are highly visible from the N Coast Road which is a Scenic Route & has Designated Scenic Views and the development plan objective is that development should not impinge in any significant way on the character, integrity and distinctiveness of the area. Some of the smaller turbines are also partially visible (photomontage). The visual impact of the turbines is still a consideration within the "Preferred" and "Open for Consideration" zones. The RES was written in 2011 when turbine size, height and rotor dia. were much smaller and had less visual impact. Commencement of a new RES is to be prepared in the coming months. The larger turbines are located in</i>

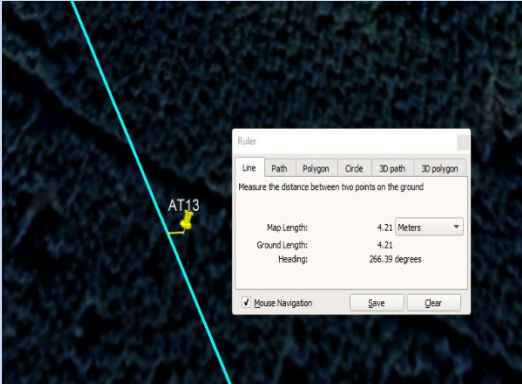
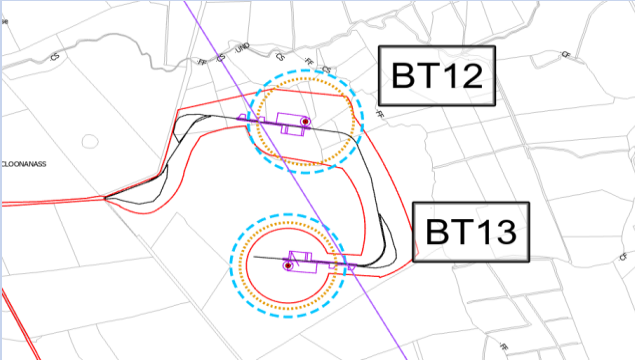
Consultee	Response Date	Response
		<i>Landscape Policy Area 1 where it is unlikely that the visual impact of windfarms can be ameliorated.</i> <i>Archaeology: The turbines will be visible of the turbines to/from the Céide Fields which is on the tentative UNESCO Tentative World Heritage Site. The development plan seeks to protect the Céide Fields from inappropriate development. The full extent of the Céide Fields archaeology site is unknown and may reach as far as the windfarm site.</i> <i>Haul Routes: The use of narrow county roads for the protracted length of proposed haul route will be problematic given their generally poor structural condition and restricted carriageway width. The traffic generated by the development (construction materials, labour-force, turbine deliveries etc) will cause serious disruption to local road users. Palmerstown Bridge is a Protected Structure in the County Development Plan. It an objective of the development plan to Note of Meeting as agreed with Mayo County Council. Date: 29th August 2023 Protect those structures in the RPS together with the integrity of their character and setting. The setting of bridge is affected by the land-take for the road widening haulage.</i> <i>Roads: MCC is not in favour of laying electricity cables in the road carriageway.</i> <i>AA: Given the proximity of the proposal to SACs & SPAs AA will probably be required.</i> <i>EIA: An EIAR will be required given the project is in excess of the EIA threshold in the Planning & Development Regs 2001-2022.</i> <i>MCC Opinion: MCC would not be in favour of such a proposal at this location.</i>
RTÉ Donnybrook	02/03/2023	<i>The proposed windfarm at Tirawley, Co. Mayo will not affect 2m's fixed linking. The closest off-air path that we have is 1600m to the north.</i>

Consultee	Response Date	Response
Dublin 4 (2RN is the trading name of RTÉ Transmission Network DAC)		<i>There is however a risk of interference to broadcast services in the area. We would therefore ask that a protocol be signed between 2rn and the developer should the site go ahead.</i>
Virgin Media Television Westgate Business Park Ballymount Dublin 24	No response received	<i>No response 05/01/2024</i>
Three	08/03/2023	<i>Response received 08/03/2023 "I've reviewed the proposed wind farm development at Tirawley Windfarm Co. Mayo. We have 3 links on the Three Ireland Microwave Transmission network that traverse through this area. Going by your current positions only 1 of our links will be affected. (The top link below). But I've included all 3 in the table below. The Wind Turbine is being built right in the path of this link. This is our Main Backhaul link back into Ballina".</i>

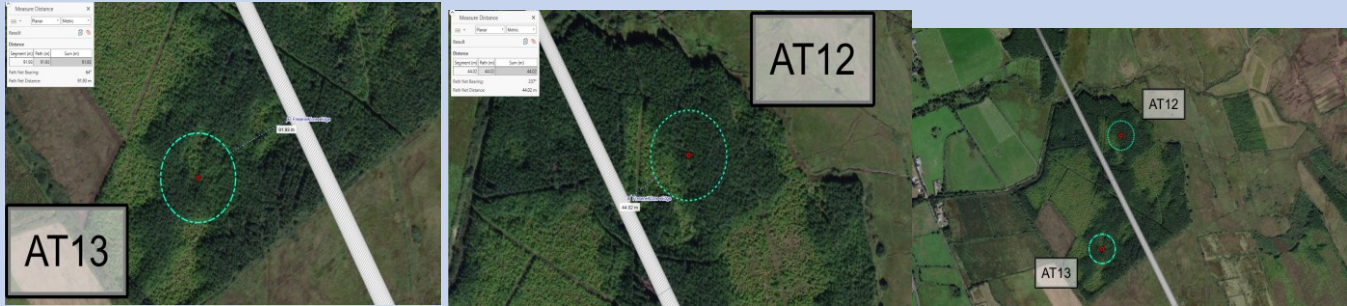
Consultee	Response Date	Response																																																														
		<table><tr><th rowspan="2">Link Name / ID</th><th rowspan="2">Band MHz\GHz</th><th rowspan="2">Link Length</th><th colspan="5">Site A</th><th colspan="5">Site B</th></tr><tr><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th></tr><tr><td>20109</td><td>13</td><td>21.7km</td><td>54.28783</td><td>9.30174</td><td>115,280</td><td>338,452</td><td>25</td><td>54.10937</td><td>9.16536</td><td>123,833</td><td>318,434</td><td>55</td></tr><tr><td>50474</td><td>15</td><td>16km</td><td>54.28783</td><td>9.30174</td><td>115280</td><td>338452</td><td>22</td><td>54.21174</td><td>9.09278</td><td>128756</td><td>329752</td><td>15</td></tr><tr><td>50482</td><td>26</td><td>4.8km</td><td>54.28783</td><td>9.30174</td><td>115280</td><td>338452</td><td>22</td><td>54.27854</td><td>9.37406</td><td>110550</td><td>337508</td><td>22</td></tr></table>   <u>JOD Response</u> <i>We have adjusted AT01 recently to avoid Link Name/ID20109 (Purple Line seen Below). Due to space constraints, it could only be adjusted so much where the link no longer passes through the centre mass of the turbine (red dot). However, it is still within the rotor diameter of the turbine (orange circle) i.e. the area within the turbines blade area. Can you confirm if this will interfere with the link”</i>	Link Name / ID	Band MHz\GHz	Link Length	Site A					Site B					Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height	20109	13	21.7km	54.28783	9.30174	115,280	338,452	25	54.10937	9.16536	123,833	318,434	55	50474	15	16km	54.28783	9.30174	115280	338452	22	54.21174	9.09278	128756	329752	15	50482	26	4.8km	54.28783	9.30174	115280	338452	22	54.27854	9.37406	110550	337508	22
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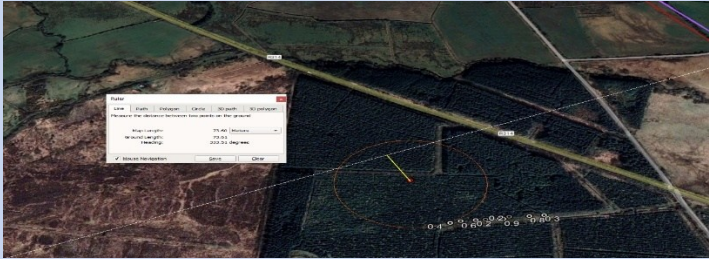
Consultee	Response Date	Response																																				
		 <u>Three Response</u> <i>“We are looking at rerouting our MY0156 site to avoid this development. Can you plot this link below in you’re system? I think it will route between AT01 and AT02 turbine blades. Also, any chance that you have the coordinates for this whole development in Irish Grid format”.</i> <table><tr><th rowspan="2">Link Name / ID</th><th rowspan="2">Band MHz/GHz</th><th rowspan="2">Link Length</th><th colspan="5">Site A</th><th colspan="5">Site B</th></tr><tr><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th></tr><tr><td>Proposed</td><td>18</td><td>11.8km</td><td>54.28783</td><td>-9.30174</td><td>115,280</td><td>338,452</td><td>25</td><td>54.19301</td><td>-9.22191</td><td>120,296</td><td>327,806</td><td>25</td></tr></table> <u>JOD Response</u> <i>“The proposed re-routing takes the link outside AT01’s blade sweep, identified as the orange circle below. The purple line identifies the existing link and the white the proposed link. Please see attached co-ordinates as requested”.</i>	Link Name / ID	Band MHz/GHz	Link Length	Site A					Site B					Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height	Proposed	18	11.8km	54.28783	-9.30174	115,280	338,452	25	54.19301	-9.22191	120,296	327,806	25
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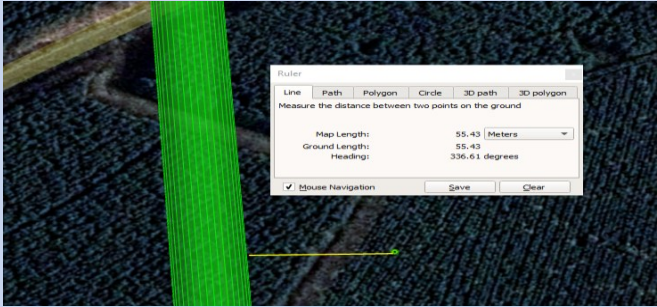
Consultee	Response Date	Response																																				
		 <u>Three Response</u> <i>“That’s great thanks. We’ll look to reroute the link as shown by the white line”.</i>																																				
Vodafone Netshare Ireland Iveagh Buildings Carrickmines Dublin 18	02/03/2023	<u>Vodafone Response received 02/03/2023</u> <i>“I can confirm that the proposed Tirawley windfarm development in Co. Mayo will cause a line of sight issue with the following microwave link on the Vodafone network”.</i> <table><tr><th rowspan="2">Link Name / ID</th><th rowspan="2">Band MHz/GHz</th><th rowspan="2">Link Length</th><th colspan="5">Site A (MO093, Ballycastle)</th><th colspan="5">Site B (MOBLA, Ballina)</th></tr><tr><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th><th>Lat</th><th>Long</th><th>Easting</th><th>Northing</th><th>Ant Height</th></tr><tr><td>MO093-MOBLA-UG2</td><td>15GHz/56MHz</td><td>21.11km</td><td>54.2734886960716</td><td>-9.3274362197264</td><td>113572</td><td>336884</td><td>10m</td><td>54.109414549</td><td>-9.165312229</td><td>123832</td><td>318435</td><td>30m</td></tr></table> <i>“Please note that only one of the proposed wind turbines (AT13) is close enough in proximity to our microwave link (less than 5m) to cause issues. If the wind turbine location isn’t amended this will cause serious performance issues our microwave link effectively making the link useless. Please see the screenshots below which aim to show the issue with AT13.”</i>	Link Name / ID	Band MHz/GHz	Link Length	Site A (MO093, Ballycastle)					Site B (MOBLA, Ballina)					Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height	MO093-MOBLA-UG2	15GHz/56MHz	21.11km	54.2734886960716	-9.3274362197264	113572	336884	10m	54.109414549	-9.165312229	123832	318435	30m
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Consultee	Response Date	Response
		 JOD Response <i>“We have adjusted AT13 & AT12 recently to avoid Link MO093-MOBLA-UG2 (Purple Line seen Below). Due to space restraints, it could only be adjusted so much that the link no longer passes through the centre mass of the</i>  <i>turbines (red dot). However, it is still within the rotor diameter of the turbine (orange circle) i.e. the area the turbines blades will occupy/spin. Can you confirm if this will interfere with the link.</i>

Consultee	Response Date	Response
		<u>Vodafone Response</u> <i>"Thanks for sending on the amended details.</i> <i>Unfortunately, as our link would still be passing through the rotor diameter this will interfere with our link and would cause a line of sight issue every time the blades spin. This issue would cause our microwave link to drop every day. For our microwave link to work without interference here we would need to guarantee that there is a minimum of 30m distance from the top of the rotor blade to the first Fresnel zone of our microwave link. This is the only way that I can confirm that no interference would occur".</i> Meeting Held with Vodafone 26/07/23 to discuss setback distances. <u>JOD Post Meeting Response</u> <i>"Thanks for your time this morning, it was great to close out this issue. As discussed, please see attached images. Please note the red circle = turbine tower (centre point), green circle = maximum rotor wingspan (105m rotor diameter) and grey line = Fresnel zone. AT13 distance from outer most rotor blade to outer most Fresnel Zone = 93.93m. AT12 distance from outer most rotor blade = 44.02m to outer most Fresnel Zone".</i>

Consultee	Response Date	Response												
		 <u>Vodafone Response</u> <i>“Thanks for your explanation this morning.</i> <i>I can confirm that I’m happy that the proposed locations of AT12 and AT13 won’t impact the Fresnel zone of our MW link as at least 30m of buffer space has been allocated from the new proposed turbine locations. Please let me know if I can help with anything else”.</i>												
Tetra Ireland	27/03/2023	<i>“We anticipate no impact from the development as proposed.”</i>												
ENET	15/03/2023	Response received 15/03/2023 <i>“We have only link possibly affected”:</i> <table><tr><th>Link name</th><th>A-End Coordinates</th><th>A-End Dish Height</th><th>B-End Coordinates</th><th>B-End Dish Height</th><th>Frequency</th></tr><tr><td>TC Schanttra</td><td>54.203520</td><td>21m</td><td>54.264328</td><td>6m</td><td>13GHz</td></tr></table>	Link name	A-End Coordinates	A-End Dish Height	B-End Coordinates	B-End Dish Height	Frequency	TC Schanttra	54.203520	21m	54.264328	6m	13GHz
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TC Schanttra	54.203520	21m	54.264328	6m	13GHz									

Consultee	Response Date	Response					
		- S N Beanchair	-9.4350090		-9.226600		
		JOD Response <i>“On double checking links in the surrounding area of the Proposed Tirawley Windfarm, one of our Turbines AT06 is close to the below link mentioned. Please see attached image. The link passes the turbines base at a distance of 73.60m. The turbines blades measure at 52.5m giving a setback distance of 21.1m from the links path. Can you confirm if this setback distance is enough to avoid any interference with the mentioned link TC Shanettra - S N BEANNCHAIR”.</i>  ENET Response <i>“We should be just about ok based on my calculations below”</i>					

Consultee	Response Date	Response
		
Broadcasting Authority Ireland (BAI)	06/03/2023	<i>"The BAI does not perform an in-depth analysis of the effect of wind turbines on FM networks. However, we are not aware of any issues from existing windfarms into existing FM networks. Also, the proposed windfarms are not located close to any existing or planned FM transmission sites."</i>

*Note: Any further micro sitting of turbine positions was done so in adherence to the buffers set out by the telecommunications providers above.

13.6.3 Assessment Methodology

Consultation with telecommunications operators was initiated during the scoping phase of this EIA to identify any potential microwave or telecommunication links that could be affected by the Proposed Development. Details of the Proposed Development were shared with link operators. A summary of responses are shown in **Table 13.2**.

Telecommunications operator 'Three' responded with concerns over wind turbine AT15 (formerly AT01) of the Proposed Development being located directly in the path of 1 of their existing transmission links.

Telecommunications operator 'Vodafone' responded with concerns over distances between wind turbine AT07 (formerly AT13) and AT08 (formerly AT12) of the Proposed Development and their existing transmission links.

Telecommunications operator 'ENET' responded with concerns over distances between the Proposed Development and their existing transmission links. Following mapping, concerns between the existing ENET transmission link and wind turbine AT04 (formerly AT20) were raised.

13.6.4 Assessment of Potential Effects

Any potential effects, which are associated with the operational phase of the Proposed Development, are classified as long-term effects. In the event that significant effects do occur, appropriate mitigation measures can be implemented such that there will either be a negligible effect, or no effect, on infrastructure as a result of the Proposed Development. All potential effects, which are associated with the operational phase of the Proposed Development, are classified as long-term effects.

13.6.4.1 The 'Do-nothing Effect'

If the Proposed Development does not proceed, there will be no additional effects on telecommunications over the baseline situation. This 'do-nothing' scenario would result in no interference in electromagnetic signals subject to the continuation of current activities and practices. The likely evolution of the baseline environment may continue be continued farming/ agricultural uses or alternative types of farming and forestry practices.

13.6.4.2 Construction Phase

During the construction phase, there are likely to be several sources of temporary electromagnetic emissions (1) TV/radio (2) microwave (3) telecommunications. Chief

among these will be the brief use of electrical power tools and the use of electrical generators which may be brought onsite before mains electricity is provided. These devices are required by Irish and European law to comply with the EMC Directive 2014/30/EU, as amended. Compliance with this Directive will mean that the electromagnetic emissions from these devices will not cause interference to other equipment. The likely sources of electromagnetic emissions from the Proposed Development will have low strength and will be located at such a distance from potential receptors that any likely effect will be imperceptible.

Other potential effects during the construction phase are likely to be as a result of tall cranes used for constructing the turbines. These cranes will be located close to the proposed turbine. There is potential for cranes at AT15 and AT16 to interfere with 1 link which passes through the area. There is a potential for cranes at AT07 and AT08 to interfere with 1 link which passes through the area. There is a potential for cranes at AT04 to interfere with 1 link which passes through the area. However, any effect will be temporary in nature as it will only last when the mentioned turbines (AT04, AT07, AT08, AT15 & AT16) are being erected (approximately 2-3 days). The effect can be classed as moderate negative, but short-term in nature.

A number of telegraph poles will likely need to be temporarily removed to facilitate the transport of turbine components to the Wind Farm Site. This will have temporary, short-term effects on telecommunications in the locality which can be described as not significant.

13.6.4.3 Operational Phase

The telecoms effect assessment found there will likely be interference with one Vodafone transmission link (link from Ballycastle to Ballina) and one Three link (link from Knockboha to Ballina). This is due to an infringement of 4.21 m into the Fresnel Zone (0.6 Fresnel) for the Vodafone link and a direct overlap of the turbine location with the Three link. The Fresnel Zone is the area around the visual line of sight that radio waves spread out into after they leave the antenna. Signal strength is dependent on the maintenance of a clear line of sight.

Following the feedback from the Three link operator, rerouting of the Three link from Knockboha to Ballina to Knockboha to Tawnaghmore was undertaken by Three. The rerouting allowed the link to pass at an acceptable setback distance from AT15. No effects are predicted on the Three link.

Following feedback from the Vodafone operator the position of wind turbine AT07 was moved southwest and AT08 was moved east so that they are located at an acceptable setback distance from the Fresnel zone. Therefore, no effects are predicted on the Vodafone link. Following further investigation from the ENET operator the link from Shanettra to Beannchair was determined to be situated at a sufficient distance back from wind turbine AT07. Therefore, no effects are predicted on the ENET link.

13.6.4.4 Final Decommissioning Phase

When decommissioning of the Proposed Development takes place, effects associated with this phase on telecommunications will be similar to those at the construction phase. The effect can be classed as moderate negative, but short-term in nature.

13.6.5 Mitigation Measures

All electrical elements of the Proposed Development are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety. The effects on human health are assessed in **Chapter 5: Population and Human Health**.

Mitigation measures were undertaken in the design phase through mitigation by avoidance i.e., the known routes of the telecommunication links were plotted and a buffer was applied to them, outside of which the proposed turbines were located.

AT07 was moved southwest and AT08 was moved east outside of the Vodafone radio link (Ballycastle to Ballina) Fresnel Zone. Rerouting of the Three link from Knockboha to Ballina to Knockboha to Tawnaghmore was undertaken by Three avoiding conflicts with AT15. Following further investigation from the ENET operator the link from Shanettra to Beannchair was determined to be situated at a sufficient distance back from turbine AT04. Therefore, no effects are predicted on the ENET link. Compliance with the EMC Directive 2014/30/EU will mean that the electromagnetic emissions from devices used will not cause interference to other equipment.

13.6.6 Residual effects

The effect on telecommunications during construction/decommissioning is likely to have a temporary slight negative effect.

The proposed turbines will have a long-term moderate negative effect on telecommunications during the operational phase. Implementation of the measures

outlined in **Section 13.6.6** will ensure that any residual effects will be not-significant negative and long-term in duration.

The effect on telecommunications during the construction and decommissioning phase of the Proposed Development due to electromagnetic emissions from the Proposed Development is likely to have an imperceptible effect.

13.6.7 Cumulative Effects

There are 15 no. proposed, permitted or operational wind farms within 20 km of the Proposed Development (**Appendix 1.2**). In line with the Draft Wind Energy Guidelines 2019, each Developer is responsible for engaging with all relevant telecommunications operators to ensure their proposals will not interfere with television or radio signals by acting as a physical barrier. As such, the cumulative effect on telecommunications during the operational phase will remain not-significant, negative and long-term in duration. The cumulative effect on telecommunications during the construction and decommissioning phase of the Proposed Development due to electromagnetic emissions from the Proposed Development is likely to remain as imperceptible and therefore not significant.

Other evaluated developments in the area other than wind farms were deemed not to impose a cumulative effect in respect to interfering with telecommunications.

13.6.8 Statement of Significance

The implementation of mitigation measures will ensure no interference with communication links. Therefore, no significant effects are predicted on telecommunications or radio reception as a result of the Proposed Development.

13.7 ELECTRICITY NETWORKS

13.7.1 Introduction

This section describes the transmission network and the anticipated GCR option. It is not proposed to utilise any elements of the distribution network.

The nationwide electricity transmission system allows for the transport of large volumes of electricity from generation stations, including wind farms, to bulk supply points near the main population centres where it interconnects with the distribution system.

The preferred GCR will be an UGC from the Onsite Substation to the Tawnaghmore 110 kV Substation. Refer to **Figure 2.2** for the proposed GCR. The overall length of this

connection is 13.55 km. Of this, 12.43 km is located along the public road corridor, and 1.12 km is within the Killala Business Park grounds.

Connection will be sought from the grid system operator by application to EirGrid. The Onsite Substation will connect via 110 kV UGC to the Tawnaghmore 110 kV substation. At the existing Tawnaghmore 110 kV substation, the cable will connect into existing infrastructure within the confines of the substation and its compound. The Grid Connection will be constructed in line with the relevant EirGrid and or ESBN specifications.

A second connection option considered in this EIAR is a 110 kV underground Interconnector cable between the Proposed Development (Tirawley Wind Farm) and a Proposed Hydrogen Plant known as the Killala Energy Hub, granted consent by Mayo County Council on May the 27th, 2025 (Planning Reference No. 2360266). The Proposed Hydrogen Plant is in Killala Business Park in the townland of Tawnaghmore Lower and Meelick, south of Killala Village, Co. Mayo. Refer to **Figure 2.3** for Proposed Interconnector Cable Route.

Both connections follow the same cable route from the Wind Farm Site to the townland of Tawnaghmore Lower, where the existing EirGrid 110 kV substation and the Proposed Killala Energy Hub are located.

Both the Proposed Tirawley Wind Farm and Killala Energy Hub Developments are in the control of the Developer (Constant Energy). An EIAR and NIS were prepared as part of Killala Energy Hub application, a copy can be found on the Mayo Eplanning website.

13.7.2 Assessment Methodology

A desktop study was carried out to identify a GCR between the Wind Farm Site and the Tawnaghmore 110 kV Substation, located in the townland of Tawnaghmore Upper, Co. Mayo. The Tawnaghmore 110 kV Substation is located approximately 7.17 km southeast of the Proposed Development as the crow flies.

The GCR between Tirawley Wind Farm and Tawnaghmore 110 kV Substation is proposed to be an UGC, utilising sections of cabling in regional roads, local roads and third-party lands. The length of the connection is c. 13.55 km.

An update to the 110 kV Tawnaghmore Substation is likely to be required to allow for the additional capacity and to meet the specification requirements of ESB Networks.

A second connection option considered in this EIAR is a 110 kV underground Interconnector cable between the Proposed Development (Tirawley Wind Farm) and a Proposed Hydrogen Plant known as the Killala Energy Hub, granted consent by Mayo County Council on May the 27th 2025 (Planning Reference No. 2360266). The Killala Energy Hub Substation is located approximately 6.90 km southeast of the Proposed Development as the crow flies in the townland of Tawnaghmore Lower and Meelick, south of Killala Village, Co. Mayo. The interconnector between Tirawley Wind Farm and Killala Energy Hub Substation is proposed to be an UGC, utilising sections of cabling in regional roads, local roads and third-party lands. The length of the connection is c. 13.55 km and follows the same route as the GCR option proposed to connect to Tawnaghmore 110 kV Substation. Refer to **Figure 2.3** for Proposed Interconnector Cable Route.

The Killala Energy Hub (Planning Reference 2360266) states that *“Following the grant of planning permission, the Developer will apply for a grid connection to EirGrid/ESB via the Enduring Connection Policy (ECP) process. EirGrid/ESB will determine the type of substation i.e. 38 kV or 110 kV. A separate planning application for the substation and grid connection will be made to the determining authority (An Bord Pleanála/Mayo Co. Council) at the appropriate time. For the purposes of the EIAR process and the drawings the larger footprint of the 110 kV GIS substation is considered”*.

Both connections follow the same cable route from the Wind Farm Site to the townland of Tawnaghmore Lower, where the existing EirGrid 110 kV substation and the Proposed Killala Energy Hub are located.

Both the Proposed Tirawley Wind Farm and Killala Energy Hub Developments are in the control of the Developer (Constant Energy). An EIAR and NIS were prepared as part of Killala Energy Hub application, a copy can be found on the Mayo Eplanning website.

13.7.3 Assessment of Potential Effects

All internal cabling will be underground as will the GCR from the Onsite Substation and Control Building to the Tawnaghmore 110 kV Substation, there will be no effect on the overhead electricity network.

The Proposed Development will contribute directly and in the long term to the electricity network by strengthening it through additional renewable energy generation.

At the existing Tawnaghmore 110 kV substation, the cable will connect into existing infrastructure within the confines of the substation and its compound. There is the potential that Eirgrid will consider future upgrades of the existing conductors associated with the 110 kV overhead lines leaving the Tawnaghmore 110 kV substation. An upgrade of the existing transformer of the Tawnaghmore substation is likely to be required. Such upgrades will have a slight, positive short-term effect in terms of upgrading of critical infrastructure.

There will no effect on the electrical network during the operational phase or the decommissioning phase.

If the proposed Killala Energy Hub (granted consent by Mayo County Council on the May 27th (Planning Reference No. 2360266)) is constructed and the subsequent application for an onsite 38 kV or 110 kV substation is granted a second connection option (interconnector between the Proposed Development and the proposed Killala Energy Hub) may be considered. The cable would connect into the constructed 38 kV or 110 kV substation infrastructure within the confines of the substation and its compound. Due to the fact that all onsite internal cabling will be underground as well as the interconnection from the onsite Substation to the Killala Energy Hub, there will be no effect on the overhead electricity network.

There will no effect on the electrical network during the operational phase or the decommissioning phase.

Although connection via an interconnector to the proposed Killala Energy Hub is considered an option it does not form part of this application.

13.7.4 The 'Do-nothing' Effect

If the Proposed Development does not proceed, there will be no offset to fossil fuel usage, and no provision of additional electricity in the local area, thus having a moderate negative effect and therefore not significant. The evolution of the baseline environment, which is mostly comprised of roads, is likely to be the development of existing roads and use of roads for additional services and utilities.

13.7.6 Measures

Mitigation by design and avoidance will minimise effects on existing electricity networks.

- Confirmatory drawings for all existing services will be sought upon consultation with ESB Networks.
- Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CAT scan (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected.
- The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts. The co-ordinates will be plotted on as-built record drawings for the Grid Connection cable operational phase.
- Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.

13.7.7 Residual Effects

The residual effect on electricity during construction is likely to have a slight brief negative effect and therefore not significant. The residual effect on electricity during the operational phase is likely to moderate positive and long-term.

As the electrical transmission infrastructure will remain in place, the residual effect on electricity network during the decommissioning phase is likely to be slight, positive and long-term.

13.7.8 Cumulative Effects

All existing and approved projects in **Appendix 1.2** and **Appendix 1.5** have been considered. There are 15 no. proposed, permitted or operational wind farms within 20 km of the Proposed Development, 7 no. of which are early proposal/ under construction, **Table 2.1, Chapter 2: Development Description**.

The GCR will be individually connected to the grid network and not share cable trenches or Joint Bays. There will be no cumulative effects relating to the Proposed Development and surrounding projects in relation to electricity networks during the construction phase.

The cumulative effects on electricity networks are anticipated to remain slight (negative) during the construction phase, positive during the operational phase and positive during the decommissioning phase. Effects will therefore not be significant.

13.7.9 Statement of Significance

No significant negative effects on the electricity networks are anticipated. There will be a long-term slight positive residual effect on transmission infrastructure in the area (due to the installation of new infrastructure). There is no effect on the distribution network, as it is not proposed to utilise any elements of the distribution network. In addition, the energy produced will be from carbon neutral technology which will offset carbon from fuel energy production locally which will be a slight positive local effect.

13.8 AIR NAVIGATION

13.8.1 Introduction

Operating wind farms have the potential to cause a variety of adverse effects on aviation. Rotating wind turbine blades may have an effect on certain aviation operations, particularly those involving radar. The physical height of turbines can cause obstruction to aviation and the overall performance of communications, navigation and surveillance equipment. According to the Irish Aviation Authority (IAA) Guidance Material Annex 14, *Structures that extend to a height of 150 m or more above ground elevation should be regarded as an obstacle*⁷. The IAA requires that all structure over 150 m in height require lighting of an obstacle⁸. All structures over 150 m in height are required to have lighting to warn aviation traffic. The proposed wind turbines at Tirawley Wind Farm will have a maximum overall tip height of 135 m above ground level during operation. The maximum tip height has been assumed for the purpose of the aviation assessment, as the infrastructure height poses the greatest risk to aviation. This will necessitate the installation of aviation warning lighting for Tirawley Wind Farm.

The distance of the Proposed Development from all aircraft facilities in Ireland was undertaken⁹. Crossmolina Airstrip is located c. 11.69 km south-west of the Wind Farm Site. Ballina Airfield is located c. 18.5 km to the south-east of the Wind Farm Site. Sligo Airport is located c. 43.2 km to the east of the Wind Farm Site. The closest international

⁷ Irish Aviation Authority (2015) *Guidance Material on Aerodrome Annex 14 Surfaces*. Available online at: [https://www.iaa.ie/docs/default-source/publications/advisory-memoranda/aeronautical-services-advisory-memoranda-\(asam\)/guidance-material-on-aerodrome-icao-annex-14-surfaces.pdf?sfvrsn=e2ae0df3_6](https://www.iaa.ie/docs/default-source/publications/advisory-memoranda/aeronautical-services-advisory-memoranda-(asam)/guidance-material-on-aerodrome-icao-annex-14-surfaces.pdf?sfvrsn=e2ae0df3_6) [Accessed: 17/09/2025]

⁸ Irish Aviation Authority (2005) Statutory Instrument No. 215 of 2005, *Obstacles to Aircraft in Flight Order, 2005*. Available online at: [https://www.iaa.ie/docs/default-source/publications/legislation/statutory-instruments-\(orders\)/irish-aviation-authority-\(obstacles-to-aircraft-in-flight\)-order.pdf?sfvrsn=fcb70df3_4](https://www.iaa.ie/docs/default-source/publications/legislation/statutory-instruments-(orders)/irish-aviation-authority-(obstacles-to-aircraft-in-flight)-order.pdf?sfvrsn=fcb70df3_4) [Accessed: 18/09/2025]

⁹ Our Airports, Airport in Ireland Available at: <https://ourairports.com/countries/IE/MO/> [Accessed: 18/09/2025]

commercial airport is Ireland West Knock Airport is located c. 47.3 km to the south-east of the Wind Farm Site. The Wind Farm Site is outside of all “no-go” areas.

13.8.2 Consultation

Consultation with the relevant aviation organisations was initiated during the scoping process, to identify any potential aviation issues that could be affected by the Proposed Development. The findings are summarised in **Table 13.3**.

Table 13.3: Summary of Consultation Response

Consultee	Response Date	Response
Irish Aviation Authority The Times Building 11-12 D'Olier Street Dublin 2	22/05/2023	1. Agree an aeronautical obstacle warning light scheme for the wind turbine development. 2. Provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location. 3. Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.
Sligo Airport, Strandhill, Co. Sligo, F91 W53K	12/03/2023	“There is no impact in relation to Sligo Airport and its Instrument Flight Procedure. However, as this area is frequently flown by the resident Coastguard Helicopter, careful consideration should be given to the lighting and marking of these structures. In this instance you should consult the Irish Aviation Authority and its clear guidelines in this regard.”
Department of Defence	24/03/2023	Main observations made are as follows: • Single turbine, structures or turbines delineating the windfarm should be illuminated by Type C, Medium Intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7days a week. Obstacle lighting should be incandescent or of a type visible to Night Vision equipment. Obstacle lighting must emit light at near Infra-Red (IR) range of electromagnetic. Any Irish Air Corps (IAC) requirements for are separate to Irish Aviation Authority (IAA) requirements.

13.8.3 Assessment of Potential Effects

Consultation with the Irish Aviation Authority and Sligo Airport Ireland revealed that the Proposed Development is not predicted to have any effect on the operations of Sligo Airport and Ireland West Airport Knock as the Proposed Development is outside their associated ‘Outer Horizontal Surface’ (over 15 km away). The Proposed Development is over 40 km from Sligo Airport and Ireland West Airport Knock. No potential effects are

predicted. The civil aviation guidelines for wind turbines covers a 30 km radius¹⁰. Therefore, no potential effects to air navigation were identified.

The effect of the Proposed Development on air navigation is limited to turbine visibility and lighting. IAA, the Irish Air Corps (IAC) and Department of Defence have made recommendations on lighting requirements and specifications, as outlined in **Table 13.3**. Both IAA and IAC will be consulted to agree all lighting specification at least 30 days prior notification of the erection of the turbines.

As such, with the implementation of appropriate lighting, the potential effect of the Proposed Development on air navigation will be not significant and be short term.

13.8.4 The 'Do-Nothing Effect'

If the Proposed Development were not to proceed, there would be no effect on aviation operations in the area. The likely evolution of the Baseline environment may be continued farming/ agricultural uses. It is also possible that other tall structure developments may be proposed in this region, that may have the potential to affect Aviation.

13.8.5 Mitigation Measures

An aeronautical lighting scheme for the Proposed Development will be agreed and installed in consultation with IAA, IAC and Department of Defence.

The following data will be supplied to the IAA airspace team and Department of Defence:

- An aeronautical lighting scheme for the Development will be agreed with the IAA and will be installed
- As-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location will be provided to the IAA
- The IAA will be notified of intention to commence crane operations with at least 30 days prior notification of their erection

Additionally, IAC will be kept informed on any progress relating to the Proposed Development, as IAC requirements are separate to IAA requirements. IAC have requested

¹⁰ CAA Policy and Guidelines on Wind Turbines, UK Civil Aviation Authority, 2016. <https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=5609> [Accessed online: 18/09/2025]

that all turbines will be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near Infra- Red (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light..

Both IAA and IAC will be consulted to agree all lighting specification at least 30 days prior notification of the erection of the turbines.

13.8.6 Cumulative Effects

All existing and approved projects in **Appendix 1.2** have been considered. There are 15 no. proposed, permitted or operational wind farms within 20 km of the Proposed Development, 7 no. of which are early proposal/ under construction, **Table 2.1, Chapter 2: Development Description**. Each Developer is responsible for engaging with the aviation authority to ensure the proposals will not interfere with aviation radio signals by acting as a physical barrier and do not encroach on flight paths. Therefore, as each project is designed and built to avoid effects arising, a cumulative effect cannot arise. Other developments have also been assessed in terms of their potential to impose a cumulative effect on aviation assets in conjunction with Tirawley Wind Farm. No likely significant effects have been identified. Therefore, it is considered there will be no cumulative effects relating to the Proposed Development and surrounding projects in relation to aviation during the construction phase.

The installation of aeronautical obstacle warning lighting as required by the ACC, IAC and the Department of Defence will mitigate against potential aviation accidents in the surrounding area. Therefore, cumulative effects on aviation during the operational and decommissioning phases are considered not significant.

13.8.7 Statement of Significance

No significant effects are predicted in terms of air navigation. In adherence to IAA Safety Regulations and International Civil Aviation Organisation, ICAO Annex 15, aeronautical obstacle warning light schemes will be installed as requested by IAA. Co-ordinates of ground and tip height elevations at each wind turbine location as constructed will be provided to the IAA. IAA will be notified of the provision of the intention to commence crane operations within a minimum of 30 days prior to erection.

The potential effects of the Proposed Development on air navigation are considered not significant.

13.9 QUARRIES

13.9.1 Introduction

Crushed stone required for construction of the Site Access Tracks, Turbine Hardstand, Turbine Foundation upfill, Onsite Substation, BESS compound, TDR works and Grid Connection works will be imported as outlined in **Chapter 17: Traffic and Transport**. The stone, estimated to be a volume of 57,916 m³ will come from a licenced quarry in the locality such as:

- Killala Rock Quarry, Killala
- Mullafarry Quarry, Killala
- Lacken Stone, Rathlacken
- Barrets Quarry, Banger Erris
- Molloy Concrete Limited, Ballina
- Harrington Concrete & Quarries, Turlough, Co. Mayo

The Mayo County Councils Eplanning website (<https://www.eplanning.ie/MayoCC/SearchTypes>) was consulted to identify how much crushed stone per annum each quarry is licensed to extract. Where information was unavailable on the Mayo County Council Eplanning website, the quarry was contacted directly via phone call. The results are identified in **Table 13.4**.

Table 13.4: Licensed Quarries in the Locality and associated Licensed Extraction Volume for Crushed Stone per annum.

Quarry Name	Address	Planning Number	Quantity of Crushed Stone in tonnes per annum
Killala Rock	Mullafarry Killala, Co. Mayo	P21708	250,000
Mullafarry Quarry	Mullafarry Killala, Co. Mayo	2360182	Not Specified
Lacken Stone	Rathlacken, Ballina, Co. Mayo	N/A	Awaiting
Barrets Quarry	Srahanarry, Bangor Erris, Co Mayo	071234	450,000
Molly Concrete Limited	Molloy Terrace, Bunnafinglas, Ballina, Co. Mayo	N/A	200,000
Harrington Concrete & Quarries	Gortnafolla, Co. Mayo	P22/1045	500,000

The locations of these quarries in relation to the Proposed Development are shown in **Figure 17.8**.

13.9.2 Assessment of Potential Effects

The construction of the Proposed Development will have an effect on natural resources such as aggregates which will be sourced from the quarries in proximity to the Wind Farm Site (**Section 13.9.1**). This will have short-term slight negative effect (i.e. not significant) on natural resources for the duration of the construction phase of the Proposed Development.

It is likely that a small amount of granular material may be required to maintain Site Access Tracks during operation which could have an effect on the source quarry. This will have a long-term imperceptible negative effect on natural resources for the duration of the operational phase of the Proposed Development but will not be significant.

The decommissioning phase will have no requirement for stone or granular material, therefore there will be no effect on natural resources for the duration of the decommissioning phase of the Proposed Development.

13.9.3 The 'Do-Nothing Effect'

If the Proposed Development were not to proceed, there would be no effect on quarry resources in the area and quarrying activities would continue. The likely evolution of the baseline environment may be continued farming/ agricultural/ forestry uses. It is also possible that other developments may be proposed in this region that require natural resources from local quarries.

13.9.4 Mitigation Measures

- Existing tracks have been used where possible, and the layout was designed to minimise the length of new Site Access Track required in order to reduce the requirement for such stone material.
- Local quarries have been identified to reduce effects on transportation (**Chapter 17: Traffic and Transportation**).
- The source quarry will be chosen based on stone which is chemically similar to that occurring at the Proposed Development. This will reduce hydrogeochemical effects (**Chapter 8: Soils and Geology**).

13.9.5 Cumulative Effects

All existing and approved projects in **Appendix 1.2 Cumulative Windfarm Sites** and **Appendix 1.5 Other Major Developments or Proposed Developments** have been considered. The very nature of a quarry is that it will be subjected to cumulative effects as it is the source of stone for almost all developments in the area.

Therefore, there will be cumulative effects relating natural quarry resources from the Proposed Development and smaller projects in the surrounds, such as one-off houses, extension to houses and housing developments relating to quarries during the construction phase. The cumulative effect on quarry resources during construction is likely short-term moderate negative effect. There will be no cumulative effect on quarry resources during the operational phase of the Proposed Development. There will be no cumulative effect on quarry resources during the decommissioning phase.

13.9.6 Statement of Significance

No significant negative effects on local quarries are anticipated. There will be a slight, permanent, negative residual effect on natural resources in the area from the construction phase. There will be no effect during either the operational or decommissioning phases. This impact effect is considered to be imperceptible in the long-term.

13.10 UTILITIES

13.10.1 Introduction

In order to assess the potential for significant effects on built services gas, water and waste in the vicinity of the Proposed Development, scoping requests were made to Uisce Éireann and Mayo County Council including Water Services and Environment departments. Refer to **Chapter 1: Introduction** and **Appendix 1.3** of this EIAR for details in relation to the EIA scoping exercise.

13.10.2 Assessment Methodology

A desk study of available information from the EPA did not identify any waste facilities, illegal waste activities, chemical monitoring points or industrial EPA licensed facilities within a 2 km radius of the Wind Farm Site.

13.10.3 Assessment of Potential Effects - Gas, Water Utilities

Gas

There are no gas mains located within the Proposed Development Redline. There is therefore no potential for effect. Gas Networks Ireland website Dial Before you Dig¹¹ was consulted, which indicated that there are no existing gas services along the GCR. Figures were generated using Dial Before You Dig at the Tawnaghmore Substation (**Figure 13.1**), Palmerstown Bridge (**Figure 13.2**) and Entrances to the Wind Farm Site (**Figure 13.3 – Figure 13.9**). Areas along the Construction Haul Route or TDR where gas infrastructure is present does not require any works and will remain undisturbed.

There will no effect on the gas network pipelines during the construction phase, no effect during the operational phase and no effect during the decommissioning phase.

Water

In relation to water services within the Proposed Developments Redline, it has been assumed that there is the potential to encounter local water services within the Proposed Development.

The following water service features were identified along the GCR:

- Air control valves
- Fitting
- Hydrant
- Mains Line
- Network Meter
- System Valve

Potential effects arising from the Proposed Development relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology** and referred to in **Chapter 5: Population and Human Health** with accompanying mitigation measures.

¹¹ <https://www.gasnetworks.ie/home/safety/dial-before-you-dig/dbyd/>

13.10.4 Assessment of Potential Effects - Waste

There are many waste types generated from the construction and operational phase of the Proposed development. These are general office waste and wash-out water, chemicals, fuels and oils, packaging waste and hazardous waste. Waste generated on site will be managed as per **Appendix 2.1, CEMP; Management Plan 5: Waste Management Plan**. The nearest waste facility to the Proposed Development is Rathroeen Civic Amenity Site (W0067-02) located approximately 11.8 km southeast of the Wind Farm Site.

Staff Facilities

During the construction, operational and decommissioning phases of the Proposed Development, there will be the typical waste and / or “disposable” waste that might be typically generated in a commercial work office setting, such as plastic and glass bottles, left-over food and sandwich wrappers / containers. Generally, this can be classified as non-hazardous waste. All such waste will be required to be disposed and temporarily stored on site prior to appropriate disposal at a waste licensed facility. The estimated range of waste generated on site per person per day will be greater in the construction and decommissioning phase than in the operational phase and is estimated to vary between 0.005 kg and 0.189 kg, with an average of 0.74k g¹². However, this average can vary widely, from 0.11 kg to 4.54 kg¹³. The effects of this waste will not be significant during construction, not significant during decommissioning phase and imperceptible during operational phase.

Sewage

It is proposed to install a rainwater harvesting system as the source of water for toilet facilities for the operational phase. Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. This is a device installed in a fuel storage tank that is capable of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank.

¹² Based on 1 hour a day within communal facilities. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. (World Bank) Available at: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html [Accessed 18/09/2025]

¹³ Trends of Solid waste management. Available at: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html. [Accessed: 18/09/2025]

Change of use is sought for the existing residential site to a Permanent Operations Building. This will involve the change of use of the existing dwelling to an operations office, providing meeting rooms and welfare facilities for the operational and maintenance staff. Existing services include a septic tank, existing water main, and electricity supply. The existing services will be upgraded to meet the needs of the Proposed Development. The septic tank will be upgraded to an appropriately sized effluent treatment system in line with the appropriate guidelines.

The maximum wastewater production during construction is estimated to be the same as the maximum water consumption (2,520 litres per day)¹⁴.

Wastewater generated at the site compounds and at the Wind Farm Site substations welfare facilities will be tankered off-site by a licensed waste collector to the nearest wastewater treatment plant, likely to be Killala or Ballycastle Wastewater Treatment Plants. There will be no on-site treatment of wastewater and effects will be not significant.

Concrete

Concrete will be used during the construction phase for the construction of Turbine Foundations, Onsite Substations, BESS and Met Mast. There is no waste concrete expected from this construction work, therefore there will be no concrete waste effect during construction phase.

Concrete structures will be left in place during decommissioning and allowed to naturally revegetate over time. This is the least impactful process of decommissioning. Leaving the Turbine Foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environmental nuisances such as noise, dust and/or vibration. There are no requirements for concrete use during the decommissioning or operational phases, as such, there will be no concrete waste generated during these phases. As the Wind Farm Site will have already been altered, the effects are imperceptible and permanent.

¹⁴Table 3 of the EPA WW treatment Manual (Treatment systems for Small Communities, Business, Leisure Centres and Hotels), Environmental Protection Agency, 1999. Quarry (Excluding Canteen) best reflects a construction site. [Available online: https://www.epa.ie/publications/compliance--enforcement/wastewater/EPA_water_treatment_manual_-small-comm_business.pdf [Accessed: 18/09/2025]]

It is expected that 20 L – 30 L of concrete washout will be produced during the construction phase, which will be collected in designated skip(s) in a bunded area located in the designated concrete washout facility at the Temporary Construction Compounds (**Figure 2.23**) located at the Site Entrance (Site Entrance 2) to wind turbine AT01, BESS and Onsite Substation and south of the Permanent Operations Building (Site Entrance 12). This concrete waste (waste code 10 13 14; waste concrete and concrete sludge) will be disposed of at a licenced facility as outlined in the CEMP **Appendix 2.1, CEMP; Management Plan 5: Waste Management Plan**.

The effects of this waste will be slight negative and temporary during construction phase, imperceptible during decommissioning phase and imperceptible during operational phase.

Chemicals, Fuels and Oils

Oil waste and diesel are classified as hazardous waste/dangerous substance. There is no expected chemical/fuel/oil waste other than from rags and residual amounts in containers. Without mitigation, the effects would be slight and medium-term in duration. This would be in the form of leaching of chemical or fossil fuel contaminants into the soil, groundwater and/or surface waters onsite. However, through the implementation of the mitigation measures set out in **Section 13.10.7**, the residual effects will be not significant in the construction/decommissioning phase. The storage/use of such liquids is not seen necessary on site during the operational phase; thus, the effects are imperceptible.

Refuelling

Refuelling onsite will only take place during the construction phase. As outlined in **Appendix 2.1, CEMP; Management Plan 5: Waste Management Plan**, where possible all refuelling onsite will be within the Temporary Site Compounds within the re-fuelling area. Only essential refuelling (e.g., cranes) will be carried outside of this area and has been mitigated by design in **Section 13.10.7**. Some refuelling of cranes may be required (to a lesser extent) during the decommissioning.

As such, the residual effects are not significant negative and temporary during the construction phase and not significant during the decommissioning phase. There will be no need for refuelling during the operational phase effects are imperceptible.

The storage/use of such liquids is not seen as necessary onsite during the operational phase; thus, the effects are imperceptible.

Packaging

Packaging will be brought onsite during the construction, operational and decommissioning phases and can include cardboard, wood and plastics used to package turbine components. Packaging waste will be dealt with in accordance with the European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014)¹⁵.

'A producer who supplies to another producer packaging material, packaging or packaged products shall comply with any reasonable request from the latter producer for data on the weight of the material or packaging concerned sufficient to enable the latter producer to comply with these Regulations.'

The occurrence of 10 kg of plastic per turbine blade, between 40 and 50 pallets and 50 to 60 cable drums are expected. This will be removed from site for re-use by an authorised person(s).

This waste is non-hazardous, and the effects of this waste are not significant. This is on account of the fact the packaging waste will be low quality and will be removed from the Site and recycled and/or disposed of at licensed waste facility with a reduced effect on the environment than if it were not mitigated for.

The effects of this waste will be slight negative and temporary during construction, imperceptible during the decommissioning phase and imperceptible during operational phase.

Metals

Metal (steel and iron) waste calculated on the basis of the weight of a typical modern turbine averages 588 tons, equating to 10,584 tons, 90% of which will be steel and iron.¹⁶ During decommissioning, it is expected that 9,527 tons of steel and iron (equivalent to 90% of the weight of the turbines) from decommissioned turbines will be removed.

Steel will be reclaimed for re-use in future steel making production where possible; subject to future steel reclamation. However, steel enclosed in the reinforced concrete Turbine

¹⁵ S.I. No. 282/2014 - European Union (Packaging) Regulations 2014 Available at: <https://www.irishstatutebook.ie/eli/2014/si/282/made/en/print> [Accessed 18/09/2025]

¹⁶ Wind Turbine facts sheet. Available at: <https://www.enelgreenpower.com/content/dam/enel-egp/documenti/impianti/flat-rocks-wind-farme-stage-1-project/resources/Wind%20Turbine%20Factsheet%20for%20Flat%20Rocks%20Wind%20Farm%20Stage%201.pdf>. [Accessed at: 18/09/2025]

Foundations will be left in place during decommissioning and allowed to naturally revegetate over time. This is the least impactful process of decommissioning. Leaving the Turbine Foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environmental nuisances such as noise, dust and/or vibration.

Metal waste in non-hazardous, much of which can be reclaimed and re-used. The effects of this waste on recycling facilities will be imperceptible during construction, imperceptible during operational phase and moderate negative and temporary during the decommissioning phase.

Excavated Materials

An estimated c. 169,165 m³ of excavated materials will be generated from within the Redline Boundary. As much as possible of the excavated material onsite will be reused onsite for reprofiling and landscaping.

It has been estimated that approximately 5,700 m³ of the excavated mineral spoil and rock will be reused as ballast on top of turbine foundations. Approximately 163,465 m³ will be permanently stored onsite in 19 no. designated spoil areas in accordance with the Peat and Spoil Management Plan in **Appendix 2.1**.

The top 100 mm layer of the GCR that is within the road (13.55 km x 600 mm wide) excavation area is potentially hazardous (containing Bitumen), this equates to 813 m³ of potentially hazardous material. This waste will be transported by an authorised waste permit holder to a licensed facility for disposal of hazardous bituminous materials (EWC code 17 03 02), in accordance with the **Waste Management Plan (Management Plan No. 5)** in **Appendix 2.1**.

The waste material to be disposed of off site is limited to the hazardous waste (containing Bitumen) from the preferred GCR, and potentially some excavated materials on site during the construction phase where it cannot be classed as a by-product. The effect of material waste disposal during the construction phase will be not-significant and temporary.

13.10.5 The 'Do-Nothing Effect'

If the Proposed Development were not to proceed, there would be no effect on the utilities or waste in the area.

The likely evolution of the baseline environment may be continued farming/ agricultural/ forestry uses. It is also possible that future developments may be proposed in this region, that have the potential to effect waste services and may also require connection to the existing utility infrastructure.

13.10.6 Mitigation Measures - Utilities

Mitigation measures relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology** and referred to in **Chapter 5: Population and Human Health**. Confirmation of the location of water services within the grid route will be sought immediately prior to construction taking place.

13.10.7 Mitigation Measures - Waste

Staff Facilities

Provision for separation of waste streams will be provided so that e.g., paper, and cardboard waste and bottles may be recycled. This waste will be appropriately stored to prevent exposure to wind, rain and wildlife.

Sewage

It is proposed to install a rainwater harvesting system as the source of water for toilet facilities for the operational phase. Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. This is a device installed in a fuel storage tank that is capable of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank.

Concrete

During the construction phase:

- Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Proposed Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Proposed Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the Proposed Development where the use of precast concrete is not possible include Turbine Foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply.
- The acquisition, transport and use of any cement or concrete onsite will be planned fully in advance and supervised at all times.

- Vehicles transporting such material will be relatively clean upon arrival onsite, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on vehicles which could be deposited on trackways or anywhere else onsite. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order.
- Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints.
- Concrete will be poured during meteorological dry periods/seasons. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e. avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any foreseen intense rainfall event (>3 mm/hour, yellow on Met Eireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Eireann. This also will avoid such conditions while concrete is curing, in so far as practical.
- Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately.
- Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.
- Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g., using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off.
- No surplus concrete will be stored or deposited anywhere onsite. Such material will be returned to the source location or disposed of off-site appropriately. A concrete washings area can be seen on **Planning Drawing 6289-PL-400** and **Planning Drawing 6289-PL-401**.

Upon implementation of the above mitigation measures, the effects of the construction of the Proposed Development are considered to be not significant.

Chemicals, Fuels and Oils

All storage containers of over 200 litres will have a secondary containment of 110 % capacity to ensure that any leaking oil is contained and does not enter the aquatic environment.

Only essential refuelling (e.g., cranes) will be carried out, outside of this area but not within 50 m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection.

A Chemical and Waste Inventory will be kept. This inventory will include:

- List of all substances stored onsite (volume and description)
- Procedures and location details for storage of all materials listed
- Waste disposal records, including copies of all Waste Transfer Notes detailing disposal routes and waste carriers used
- Any tap or valve permanently fixed to the mobile unit through which oil can be discharged to the open or when delivered through a flexible pipe which is fitted permanently to the mobile unit, will be fitted with a lock and locked shut when not in use
- Sight gauges will be fitted with a valve or tap, which will be shut when not in use sight gauge tubes, if used will be well supported and fitted with a valve
- Mobile units must have secondary containment when in use/out onsite

Under the EU Directive 2008/68//55/EC all such dangerous substances will be conveyed in a container that complies with the Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)¹⁷. As such the manufacturer of each bowser will provide certification to contractors that the following:

- A leak-proof test certificate
- A copy of the Intermediate Bulk Container (IBC) approval certificate
- An identification plate attached to the container

Where mobile bowsters are used onsite, guidelines will be followed so that:

- Any flexible pipe, tap or valve will be fitted with a lock where it leaves the container and be locked shut when not in use;
- Flexible delivery pipes will be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Where possible, a nozzle designed to dispense oil is used;

¹⁷ ADR, 2023 (European Agreement Concerning the International Carriage of Dangerous Goods by Road) Available at: <https://unece.org/transport/standards/transport/dangerous-goods/adr-2023-agreement-concerning-international-carriage> [Accessed: 18/09/2025]

- The pump or valve will have a lock and be locked shut when not in use.

For loads in excess of 1000 litres (220 gallons), the bowser vehicle driver will have undergone training and hold a special license.

Refuelling

During construction/decommissioning, where possible all refueling onsite will be within the Temporary Site Compounds within the re-fueling area (**See Drawing 6289-PL-400 and Drawing 6289-PL-401**). Only essential refueling (e.g., cranes) will be carried out, outside of this area, but not within 50 m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection. This membrane will be inspected and if there is any sign of oil contamination, it will be removed from site by a specialist licensed waste contractor.

All vehicles will be well maintained and free from oil or hydraulic fuel leaks. Refuelling will take place via a mobile double skinned fuel bowser. The bowser will be a double axel refueling trailer which will be towed to the refueling locations by a 4x4 vehicle. The 4x4 will carry, a drip tray, spill kit and absorbent mats in case of any accidental spillages. Only designated competent personnel will refuel plant and machinery on the Wind Farm Site.

Packaging

In accordance with the waste hierarchy, packaging will be returned to the originator ahead of re-use or recycling. Where this is not possible, waste will be separated as appropriate and safely stored on site appropriately in anticipation of recycling.

Metals

Waste metals from concrete reinforcing etc. will have a commercial value and therefore there is an additional economic incentive for the appropriate re-use or recycling with the appropriate licensed waste contractor.

13.10.8 Residual Effects

The residual effect on the water infrastructure and services during the construction phase will be imperceptible during both the operational and decommissioning phases. Effects will not be significant.

There will be no residual effect on gas infrastructure and services during the construction phase, operational phase and decommissioning phase.

The residual effect on waste facilities is likely to have a short-term not significant negative effect during construction, a long-term imperceptible effect during the operational phase and short-term not significant effect during the decommissioning phase.

13.10.9 Cumulative Effects

All existing and approved projects in **Appendix 1.2** and **Appendix 1.5** have been considered. All local waste facilities will be subjected to cumulative effects from any development in the source of stone for almost all developments in the area.

All wind farms in close proximity of the Proposed Development area are operational or currently awaiting a grant decision. Operational wind farms are likely to be in imperceptible quantities in terms of the cumulative effects on local waste facilities. If construction phases of consented but not yet constructed wind farms were to overlap, there's potential for cumulative effects on local waste facilities, though any effect is expected to be limited, slight to moderate, and of short duration.

Soil and stone (non-hazardous) (EWC code 17 05 03) and to a lesser extent bituminous mixtures (EWC code 17 03 02) will be generated on site. Soil and stone is classed as a byproduct under Article 27 of the European Communities (Waste Directive) Regulations, 2011. Bituminous waste from the GCR will be disposed of at an appropriately licenced facility. If the timing of the commencement of any of the permitted or proposed wind farms coincide with the timeframe of the construction of the Development, there would some effect on waste disposal facilities.

There are two wind farm site's under consideration between 6.5 km and 6.9 km from the proposed Wind Farm Site and five other permitted/ proposed/ under construction wind farms between a distance of 11.7 - 22.3 km from the Wind Farm Site. However, in the unlikely event that these wind farms are constructed at the same time, given that there are 32 registered waste facilities for soil and stones (non-hazardous) (EWC code 17 05 04), in Co. Mayo and 1 no. waste facilities for soil and stones (hazardous) (EWC code 17 05 03*) located in Mayo. There are 14 registered waste facilities for bituminous mixtures (EWC code 17 03 02) located in Co. Mayo. The increase on the existing the waste disposal quantities will be a not significant, short-term during the construction phase.

13.10.10 Statement of Significance

There are no gas mains located within the Proposed Development Redline Boundary.

There is therefore no potential for effect.

Potential effects arising from the Proposed Development relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology**. No significant negative effects on the water infrastructure and services are anticipated. The effect due to the Proposed Development will be not significant.

The residual effects of waste produced as a result of the construction, operational and decommissioning phases of the Proposed Development are considered to be not significant.

13.11 ROAD AND RAIL NETWORK

13.11.1 Introduction

Public transportation is provided along R314, east of the Proposed Development. The Bus Eireann bus service no. 455 travels from Ballina Bus Station to the Village of Killala. Busses are available from Ballina to a number of destinations including Galway and Dublin. Irish Rail provides services from Ballina and Westport to Dublin Heuston.

13.11.2 Assessment of Potential Effects

13.11.2.1 Construction Phase Effects

Traffic numbers during construction are outlined in **Chapter 17: Traffic and Transport, Section 17.6.1**. As the roads are estimated to have sufficient spare capacity, the overall potential effect on the local roads is assessed to be a moderate, negative effect of short-term duration and high probability during construction of the Proposed Development.

Where roads are opened for the installation of electrical cables, moderate negative temporary effects are likely to arise on these roads during construction.

13.11.2.2 Operational Phase Effects

Weekly routine inspection and preventative maintenance visits will be necessary to provide for the smooth and efficient running of the Proposed Development. A car or van will normally be required for these routine inspections. Under normal circumstances the operation of the Proposed Development would require 1-2 visits to the site per week by trained personnel and/or accompanied visitors. In the case of a major fault e.g. breakdown of a turbine component, larger machinery, including possibly mobile cranes, will require

access to the site.

The Grid Connection following commissioning, will be taken in charge of by EirGrid and no regular ongoing maintenance is predicted. Due to the strict requirements of EirGrid's Functional Specification, the level of supervision normally provided by the Developer and by EirGrid, and the extent of testing prior to commissioning, the probability of the occurrence of faults on 110 kV cable connections is very low. However, should a fault occur, it would most likely be within a joint bay which could be exposed and the joint repaired over 3-4 days.

There will be slight brief negative imperceptible effect, on the road network during the operational phase.

13.11.2.3 Decommissioning Phase Effects

During decommissioning, it is envisaged that the total volume of HGV traffic will be relatively small compared to the construction period on the basis that the Site Access Tracks will remain in place to serve ongoing forestry and agriculture activity and the Turbine Hardstands will be allowed to revegetate into the surrounding habitat with only the turbines being removed from site for recycling/reconditioning. This phase could be expected to last approximately 12-24 weeks. With the Site Access Tracks and Turbine Hardstands are left in place and revegetated, the effect is predicted to be an imperceptible effect on traffic.

13.11.3 The 'Do-Nothing' Effect

If the Proposed Development were not to proceed, there would be no effect on the road and rail network in the area.

The likely evolution of the baseline environment may be continued farming/ agricultural/ forestry uses. It is also possible that future developments may be proposed in this region, that have the potential to effect road and rail network services.

13.11.4 Mitigation Measures

Mitigation measures relating to road and rail properties outside the Proposed Development footprint may be required. **Chapter 17: Traffic & Transport** details specific mitigation measures to be undertaken during the construction, operational and decommissioning phase to eliminate and reduce any effect.

13.11.5 Cumulative Effects

All existing and approved projects in **Appendix 1.2** and **Appendix 1.5** have been considered. There are 15 no. proposed, permitted or operational wind farms within 20 km of the Proposed Development. Each Developer is responsible for traffic management. Therefore, as each project is designed and built to avoid effects arising, a cumulative effect cannot arise. There will be no cumulative effects relating to the Proposed Development and surrounding projects in relation to road and rail network during the construction phase.

Potential negative cumulative effects on road and rail networks are unlikely during the operational and decommissioning phases.

13.12 RECREATIONAL FACILITIES AND AMENITIES

13.12.1 Introduction

As discussed in **Section 5.3.5 of Chapter 5 (Population & Human Health)**, some attractions within the vicinity of the Wind Farm Site are:

- Killala Quay and Killala round tower, located in the village of Killala, 5.6 km south of the Wind Farm Site, are the Killala is a picturesque seaside village popular with tourists. It is famous for its role in the 1798 rebellion when a French army led by General Humbert landed at Kilcummin pier, which has led to the town being popular with historians.
- Moyne Abbey located 8.6 km east of the Wind Farm Site is situated in a stunning coastal location overlooking the mouth of the River Moy, the Bay of Killala and the Ox Mountains beyond. It is a 560-year-old friary complex with a church, tower, well preserved cloisters and has many supporting buildings still surviving relatively intact. Just 5 km northwest of Moyne Abbey is the Rosserk Friary. Built in 1440, it is one of the finest preserved Franciscan Friary in Ireland. The Irish Gothic church is well-preserved with a single-aisle nave, two chantry chapels and a bell tower. On the upper floor are the remains of the dormitory, refectory and kitchen with two fireplaces still evident.
- Lacken Strand, Lacken nestles along the rugged North Mayo coastlines along the Wild Atlantic Way between the villages of Killala and Ballycastle. It looks out onto the Atlantic Ocean and offers breathtaking views of Mayo, Sligo and Donegal.
- Ballycastle Beach, Ballycastle is a small sandy beach at Banatrahair Bay located 1.7 km northwest of the village of Ballycastle.
- Ross Beach, Killala is a sandy beach in a rural environment and is located 5 km north of Killala Town. It is located along the shoreline of Killala Bay, which is an extensive

triangular estuary with mudflats lining the sides of the channel. The bay offers rich feeding for wildfowl and waders. The ground flora here has an unusual degree of diversity. Ross Beach, Killala has great views of Bartra Island in the River Moy estuary and across Killala Bay to Enniscrone Beach on the east shore.

- A number of community facilities and amenities are available in the locality, with the village of Killala and the village of Ballycastle providing those nearest the Wind Farm Site. Killala village is home to an active soccer club (Killala FC), shops, healthcare centre, community hall and churches. Ballycastle Village is home to an active soccer club (Ballycastle United FC), shop, healthcare centre, community hall and churches. Further amenities and services are available in Ballina.
- The Céide Fields and the Céide Fields heritage centre is located 6.3 km west of Ballycastle Village. The Céide Fields is an archaeological site on the north Mayo Coast. The Site is described as the most extensive Neolithic site in Ireland and is claimed to contain the oldest known field systems globally dating back nearly 6,000 years.
- The Wild Atlantic Way, which stretches from Donegal to West Cork and incorporates County Mayo. As Ireland's first long-distance touring route, the 2500 km route journeys through 6 regions and takes in the scenic coastline and many beaches of County Mayo. The varying coastline allows for multiple recreational and water-based activities such as fishing, sailing and water sports.
- The Great Western Greenway, Ireland's first greenway, is a walking cycling trail in Mayo on the Wild Atlantic Way. Running 49km around the Eastern and Northern stretches of Clew Bay in Co Mayo. It begins in the popular seaside town of Westport and traverses through the quaint towns and villages of Newport and Mulranny before coming to a gentle finish at Achill Sound.
- The following walks and cycle routes are available across the area: Bangor Trail; Burrishoole Loops; Crossmolina Loop Walks; Achill Spur; Enniscoe House Loop; Keenagh Loop; Letterkeen; Bothy; Lough Aroher Loops; Ceathrú Thaidhg Loop; Belleek Nature Trail; Sralagagh Loop Walk; Inishbiggle Loop Walks; Foxford Way; "Slí na Sláinte" walking routes; Carrowmore and Carrowmore Lake Cycle Loop; Pullathomas Cycle Loop; and Glinsk & Rosspoint Linear Cycling Route.
- Mayo County provides angling tourism attractions, notably the Rivers Moy and Owenmore. Each of these rivers provide good salmon and trout fishing.

Further detailed description of the Proposed Development is provided in **Chapter 2, Development Description** of this EIAR.

13.12.2 Assessment of Potential Effects

13.12.2.1 Construction Phase Effects

There will be some construction stage effects on landscape character generated by the intensity of construction activities (workers and heavy machinery) as well as areas of bare-ground and stockpiling of materials as identified in the Construction and Environmental Management Plan (**CEMP, Appendix 2.1**). Such effects will be temporary/short term in duration and are, therefore, not considered to be significant.

Overall, construction stage landscape effects are considered to be of a High-medium magnitude.

13.12.2.2 Operational Phase Effects

There will be physical effects on the land cover of the Wind Farm Site and cable route as result of the Proposed Development during the operational phase, but these will be relatively minor in the context of this working rural landscape that comprises pockets of existing wind energy development and areas of commercial conifer forest. The scale of the Proposed Development will be well assimilated within its landscape context without undue conflicts of scale with underlying landform and land use patterns. For these reasons the magnitude of the landscape effect is deemed to be High-medium within the site and its immediate environs (c.1 km) reducing to Medium for the remainder of the central Study Area. The quality of the landscape effects is deemed Negative. Beyond 5 km from the site, the magnitude of landscape impact is deemed to reduce to Low and Negligible at increasing distances as the wind farm becomes a proportionately smaller and integrated component of the overall landscape fabric.

13.12.3 The 'Do-Nothing' Effect

If the Proposed Development were not to proceed, there would be no effect on the recreational facilities and amenities in the area.

The likely evolution of the baseline environment may be continued farming/ agricultural/ forestry uses. It is also possible that future developments may be proposed in this region, that have the potential to effect recreational facilities and amenities.

13.12.4 Mitigation Measures

Mitigation measures to reduce the visual effect of the Wind Farm were incorporated at the design stage. The Vestas V117 turbines were chosen due to their compact size and minimal tip height. The overall turbine blade tip height was reduced from 180 m to 135 m to minimise the visual effect on coastal vistas and popular local attractions including the

Céide Fields, the Wild Atlantic and Down Patrick Head. The siting of turbines on prominent ridgeline was avoided where possible.

Works on the TDRs for abnormal loads between Ballina Town, Co. Mayo and the Wind Farm Site. Some of these works will be relatively minor in nature, for example temporary removal of street furniture and signage. These works may have a slight, negative, temporary effect on residents, businesses and road users due to the increased noise and vibration resulting from construction activities, and increased journey times and delays due to temporary traffic management.

However, these effects will be confined to a very short period during the construction phase, prior to the delivery of the turbine components and hence, are not predicted to have a significant effect.

13.12.5 Cumulative Effects

All existing and approved projects in **Appendix 1.2** and **Appendix 1.5** have been considered. There are 15 no. proposed, permitted or operational wind farms within 20 km of the Proposed Development.

Potential negative cumulative effects on recreational facilities and amenities are unlikely during the operational and decommissioning phases.