

MWP

Chapter 15 Material Assets

Ballycar Wind Farm

15. Material Assets

15.1 Introduction

This chapter considers the potential effects on relevant material assets arising from the proposed development. A full description of the proposed development, development lands and all associated project elements is provided in **Chapter 2 Description of the Proposed Development** of this **EIAR**. The assessment comprises:

- A review of the existing receiving environment;
- Prediction and characterisation of likely effects;
- Evaluation of effects significance; and
- Consideration of mitigation measures, where appropriate.

15.1.1 Competency of Assessor

The assessment was completed by Kieran Barry and Olivia Holmes (MWP) and Consultants from *Ai Bridges*. Kieran Barry BEng (Civil/Structural Engineering), PhD (Environmental Protection) is an Environmental Consultant at Malachy Walsh and Partners (MWP), having worked for 7 years in the environmental sector. Kieran works on a variety of infrastructure projects conducting environmental assessments and supporting the delivery of a number of environmental deliverables, including Environmental Impact Assessment (EIA) Screening Reports, feasibility and constraints studies, route option assessments and Environmental Impact Assessment Reports (EIAR) including Material Assets Chapters.

The Telecommunications and Aviation assessments were completed by the Engineering Department of *Ai Bridges*, a company with extensive experience in aviation and telecommunications\electromagnetic interference impact assessment studies for EIA's. *Ai Bridges* have extensive experience in the wind farm industry and have previously worked with many utility companies under Framework Agreements for Telecommunications Signal Interference Surveying and Remediation Services. They are a leading supplier of telecommunications solutions and software services for the telecommunications industry in the Irish marketplace. They supply telecommunications solutions to the renewable energy sector and the wind farm industry throughout the Republic of Ireland, Northern Ireland and the UK since 2007. They have undertaken aviation, telecommunications and electromagnetic interference impact studies on behalf of wind farm operators on the potential impact on telecommunications networks and transmission networks of proposed wind farm developments. *Ai Bridges* has also developed a 3D software prediction model that can predict potential wind farm development interference impacts on television transmission and aviation networks.

This assessment has been reviewed by Olivia Holmes, MWP. Olivia is a Chartered Engineer and Chartered Environmental Practitioner with over twenty years' experience in Environmental Engineering focussing primarily on Environmental Impact Assessment (EIA), Appropriate Assessment (AA) and planning. She has prepared and reviewed a number of Material Assets chapters of EIARs over her career for a broad range of projects.

15.2 Methodology

The methodology of the assessment comprises:

- Identifying baseline conditions of the site and its environs.
- Identifying the sensitivity of receptors that had potential to be affected by changes in the baseline conditions.
- Predicting the magnitude of likely changes to the baseline receiving environment.
- Assessing the significance of effect taking into account sensitivity of receptors and magnitude of effect.
- Identifying and assessing appropriate mitigation measures, including alternatives.
- Assessing the significance of residual effects, taking account of any mitigation measures.

The study including desk-based research was carried out during the EIA process, starting October 2021, with a final search on the 8th December 2023 of published information and site visits to assemble the information on the local receiving environment and the proposed development.

The desk study included the following activities:

- Review of Ordnance Survey Mapping and aerial photography to establish existing land use and settlement patterns within the study area.
- Review of the Clare County Development Plan 2023-2029 in order to identify future development and planning applications within the area of the proposed development and surrounding locations.
- Review of Clare County Council's Planning Register to identify relevant development proposals.
- Review of the following sources for information regarding existing utilities:
 - Gas Networks Ireland Dial Before You Dig Maps (DBYD).
 - ESB Dial Before You Dig Maps (DBYD).
 - EIR eMaps open eir Civil Engineering Infrastructure Service.
 - Irish Water Utility Mapping.

15.2.1 Legislation, Policy and Guidance

The legislation, policy and guidance applicable to the assessment for waste is as follows:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018);
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (EU,2017);
- A Waste Action Plan for a Circular Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025 (Government of Ireland);
- Landfill Directive (2018/850) (EU, 2018a);

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- The European Union Waste Framework Directive (2018/851) (EU, 2018b); and
- The European Commission's 'Circular Economy Action Plan' (EC, 2020).

National waste management regulations in Ireland include the following:

- Circular Economy And Miscellaneous Provisions Act 2022;
- Southern Region Waste Management Plan 2015-2021;
- The Waste Management (Collection Permit) (Amendment) (No. 2) Regulations 2023;
- European Union (Waste Licensing) (Amendment) Regulations 2019;
- Waste Management (Packaging) Regulations 2014 to 2022 (as amended);
- Waste Management (Planning) Regulations 1997 (as amended) (S.I. No. 137/1997);
- Waste Management (Landfill Levy) (Amendment) Regulations 2023;
- Waste Management (Food Waste) Regulations 2009 – 2015 (as amended);
- Waste Management (Hazardous Waste) Regulations 1998 to 2000;
- Waste Management (Shipments of Waste) Regulations 2007 (as amended) (S.I. No. 419/2007);
- Waste Management Act 1996 (as amended) (Act No. 10/1996);
- Environmental Protection Agency Acts 1992 – 2011 (as amended);
- Protection of the Environment Act 2003 (as amended) (Act No 27/2003);
- Litter Pollution Acts 1997 to 2009 (as amended); and
- Planning and Development Act 2000 - 2023 (as amended) (Act No. 30/2000).

The legislation, policy and guidance applicable to the Traffic Infrastructure assessment included the following:

- Clare County Development Plan 2023-2029;
- Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections;
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE PDV 02045 May 2014.

15.2.2 Study Area

The study area includes the area of the proposed development, as well as built services, infrastructure and waste management that adjoins the planning boundary of the proposed development, refer to **Section 2.2.2.1 of Chapter 2 Description of the Proposed Development.**

15.2.3 Scope of Assessment

The Environmental Protection Agency’s (EPA) ‘Guidelines on the information to be contained in an Environmental Impact Assessment Report’ (EPA, 2022) were consulted as part of preparation of this assessment. The EPA Guidelines describes material assets to be taken to mean ‘built services’ (i.e. utilities networks including electricity, telecommunications, gas, water supply and sewerage), ‘waste management’ and ‘infrastructure’ (e.g. roads and traffic).

Table 15-1 outlines the issues which the EPA guidance documents suggest may be examined as part of the material assets impact assessment.

Table 15-1: Material Assets and Topics to be included

Material Asset	Topics to be Covered
Built Services	Electricity
	Telecommunications
	Gas
	Water Supply Infrastructure Sewerage
Roads & Traffic	Construction Phase
	Operational Phase
	Unplanned Events (i.e. Accidents)
Waste Management	Construction Phase
	Operational Phase

Based on a review of the proposed development and the suggested topic areas set out in the EPA guidelines (2022), the consideration of the projects impact on Material Assets provided within this Chapter is discussed in the context of built services. This includes transport infrastructure, electricity supply and infrastructure, telecommunications, aviation, water and wastewater infrastructure and waste management. In addition, having regard to aspects of the project that are set within an active forest plantation, commercial forestry resources have also been considered as a relevant material asset.

The majority of the other topic areas recommended for assessment under Material Assets are closely related to other sections of the **EIAR** and therefore reference should be made to the associated chapters as follows:

- Water resources are considered in the assessment on the surface water and groundwater resource provided in **Chapter 8 Water**. No further assessment is included in this chapter.
- The assessment on the land and geological resource is presented in **Chapter 9 Land and Soils**. No further assessment on this topic is included in this chapter.
- Assimilative capacity of the air resource is considered in the assessment provided in **Chapter 14 Air and Climate**. No further assessment on this topic is included in this chapter.
- **Traffic** was assessed by ORS Building Consultants, hereafter referred to as ORS. The **Traffic Assessment** is included in **Appendix 15C of Volume III** and the impacts are summarised within this chapter. The **Traffic Management Plan** is included in **EIAR Volume III, Appendix 2D Traffic Management Plan**.

15.2.3.1 Assessment Criteria

Determination of the significance of an effect will be made in accordance with the criteria and terminology outlined in the Guidelines on the information to be contained in Environmental Impact Assessment Reports EIAR (EPA, 2022).

15.2.4 Scoped out from Further Assessment

All relevant built services/waste management within the proposed development area and surrounds were considered during the assessment.

15.2.5 Statement on Limitations and Difficulties Encountered

There were no difficulties or limitations encountered during the production of the material assets chapter of this EIAR.

15.3 Baseline Environment

15.3.1 Transport Infrastructure

The proposed development entails the construction of a 12-turbine wind farm, grid connection and an on-site substation. Please refer to **Chapter 2 Description of the Proposed Development** for a full description of the proposed development.

A large commercial quarry lies beyond the north-eastern boundary of the proposed Development Site. Two local roads, running in a north-south direction on either side of the proposed windfarm, serve as routes with a notable concentration of one-off housing, particularly in the low-lying areas to the south of the site. During the operational phase the entrance to the proposed development will be from a junction off the public local road L7062. During the construction phase there will be two distinct entrances: one to accommodate construction traffic bringing in materials from the nearby quarry (Entrance Point A), and another for turbine deliveries, materials sourced from alternative quarries as well as operations and maintenance vehicles (Entrance Point B).

Entrance Point A (temporary site entrance), located in the north-eastern area of the site, is intended as a temporary access point solely for use during the construction phase. Its purpose is to facilitate the delivery of construction materials from the local quarry situated approximately 1 km to the north of the temporary entrance. This design minimises the impact of additional construction traffic on the L7062 and the residents along this road. Once the construction phase concludes, Entrance Point A will be reinstated to its original condition.

Entrance Point B (permanent site entrance), located to the south-east of the site and accessible from the L7062, will be dedicated to turbine deliveries, materials other than those from the local quarry, and operations and maintenance vehicles. While Entrance Point B will serve as a permanent access point, it will undergo modifications including scaling back, landscaping, and the installation of fencing and gating as the wind farm transitions into operational status. Please refer to **Figure 15-1** and **15-2**.

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Figure 15-1: Local Road Network and Turbine Delivery Route

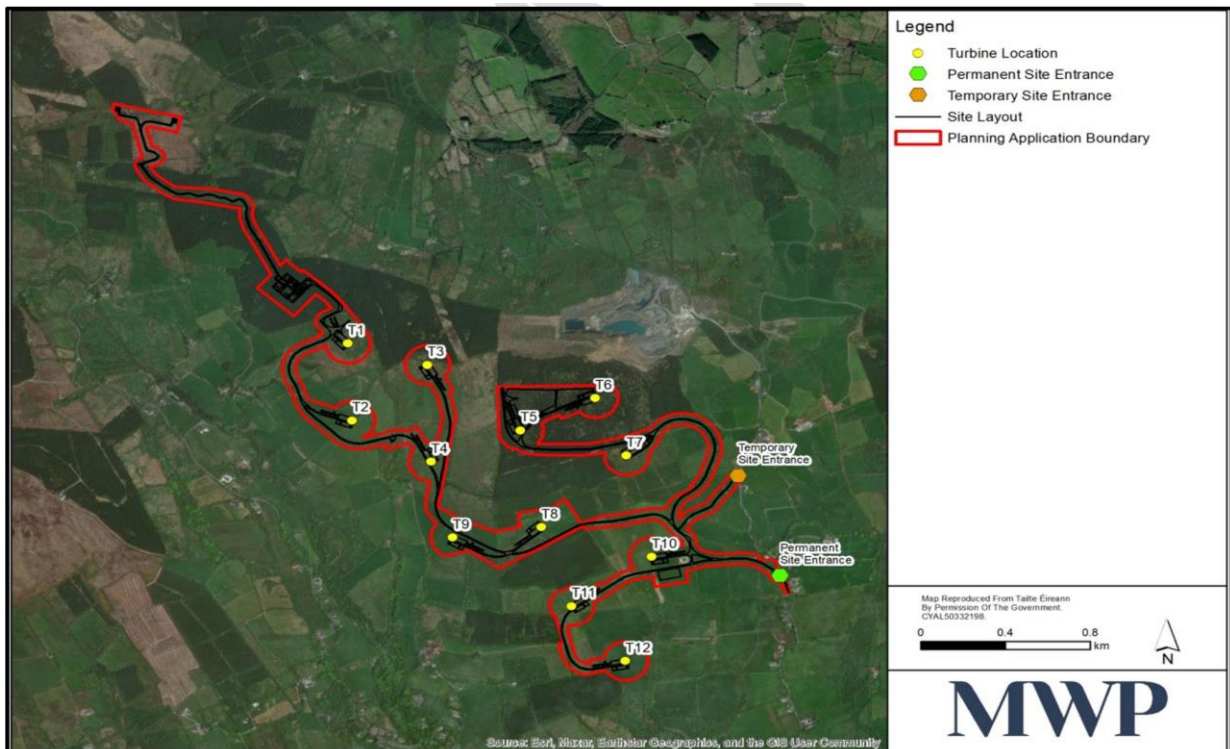


Figure 15-2: Site Access Points

The traffic generated by the new development will access the site from the R464 via the L3056 which leads north approximately 2.5km to the local access road L7062. The junction selected for the traffic assessment is the one to the local access road between the L3056 and the R464. It is assumed that all development traffic will use the assessed junction, as the road to the north beyond the existing quarry narrows to a single lane local access road which is deemed unsuitable for HGV traffic.

Turbine components will be delivered to the port at Foynes, County Limerick. The vehicles will travel along the N69, joining the N18 ring road around Limerick, routing through north Limerick City on its regional roads to reach the assessed junction, as shown in **Figure 15-3**.

The N18 connects Shannon to Limerick City and is approximately 8km south of the proposed wind farm site. The annual average daily traffic (AADT) for the N18 in 2023 according to TII automatic traffic counter data was approximately 35,170, with approximately 4% of this total comprised of HGV traffic.

The N69 is a national primary route which connects Tralee to Limerick and is located approximately 9km to the southwest of the proposed wind farm site. The AADT for the N69 in 2023 according to TII automatic traffic counter data was approximately 6,378, with approximately 8% of this total comprised of HGV traffic.

Aside from the turbine components, the majority of construction materials are anticipated to be sourced from the adjacent quarry.

The L7062 is a local access road in the north-south orientation of approximately 6m width, narrowing to 4.5m in local spots. The L3056 is a local access road on the north-south orientation of approximately 6m width. The R464 is a regional road linking O'Connor's Cross in the north-east of Parteen routing south-west to the R527 in Limerick City Centre where it terminates. The R464 is a 2-lane carriageway of approximately 7m width at the location of the assessed junction. A pedestrian footpath is situated on the southern edge of this carriageway which has public street lighting.

The speed limit on the R464 is 50km/h at the location of the junction and increases to 60km/h approximately 15m beyond the mouth of the junction to the south-west.

Figure 15-3 provides an overview of the road network in the vicinity of the proposed development. **Figure 15-4** shows a view of the assessed junction.

The full Traffic Assessment is provided in **Appendix 15C**.

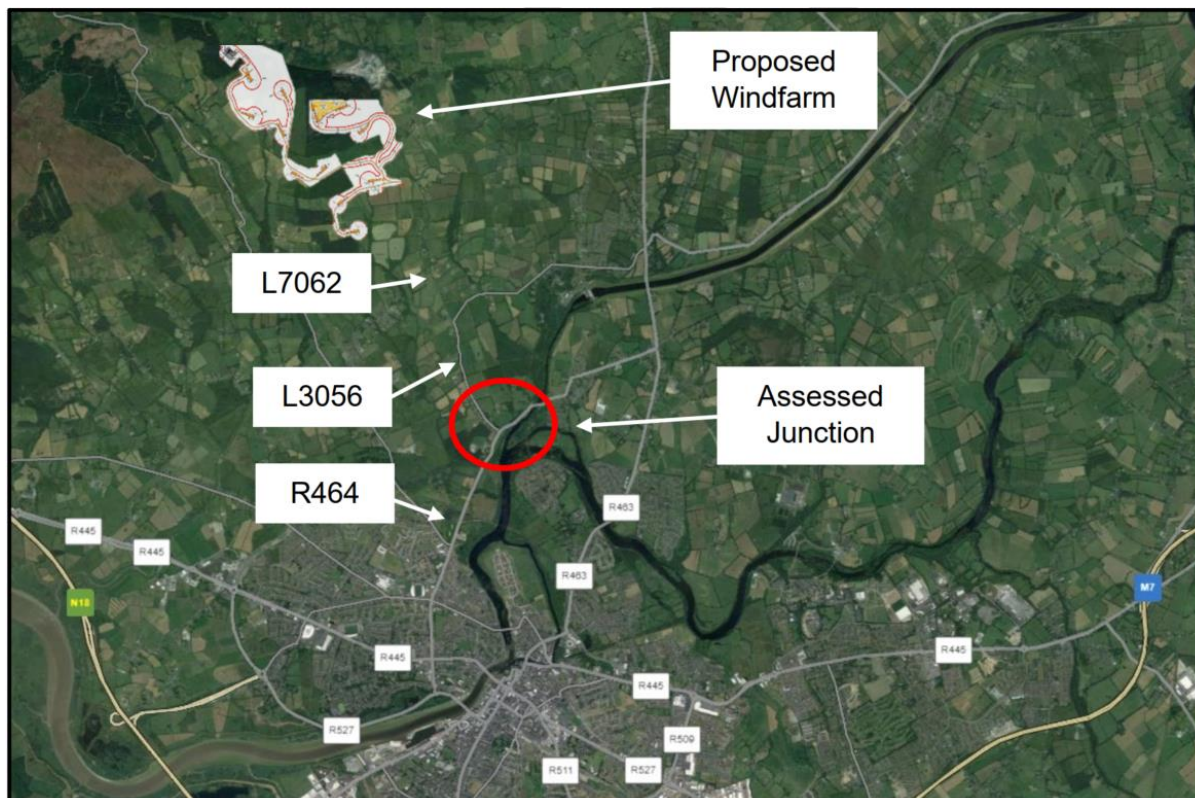


Figure 15-3: Overview of the road network in the vicinity of the proposed development



Figure 15-4: View of assessed junction looking directly north-west from R464 onto L3056

Existing Traffic Flows

Traffic counts were carried out by ORS at the location of the assessed T-junction between the R464 and the L3056 on a typical weekday in May 2022. The AM and PM peak traffic was noted to be between 07:45-08:45 and 16:45-17:45.

The traffic counts encompass all traffic movements at the assessed location, refer to **Figure 15-3**.

Table 15-2 provides the AADT figures for the N69, N18 and the regional R464.

Table 15-2: Baseline 2023 Traffic Volumes

Baseline 2023 Traffic Volumes		
		Baseline AADT
Road	HGV	AADT
N69 Between Askeaton and Foynes, Clondrinagh, Co.Limerick	8.4%	6,376
N18 Between Jn4 Cratloemoyle and Jn5 Cratloe, Cratloe, Co Clare	4.2%	35,230
R464	4.3%	7,200

Table 15-3 shows the forecasted AADT figures for the project construction commencement year of 2026.

Table 15-3: Commencement Year 2026 Traffic Volumes

Commencement Year 2026 Traffic Volumes		
		Baseline AADT
Road	HGV	AADT
N69 Between Askeaton and Foynes, Clondrinagh, Co.Limerick	9%	6,676
N18 Between Jn4 Cratloemoyle and Jn5 Cratloe, Cratloe, Co Clare	4.5%	36,904
R464	5.0%	7,540

15.3.2 Forest Resources

Forests are an important renewable resource with a role to play in sustainable rural economic development. The County's forestry resources are also recognised as having a role to play in recreation in rural areas and have the potential to make an important contribution to the tourism offering in the County. Many visitors and members of the local community use forests for recreation such as walking, running, bird-watching and mountain-biking and many trails and amenities have been developed for such activities, however none of these recreation uses are in place within the forestry on the proposed development site.

Existing land cover at the site is a mixture of Pastures and Coniferous Forests. The majority of the site consists of pastures while the more elevated areas of the site are composed of coniferous forest, which is owned and

managed commercially. The surrounding land includes some pastures and lands principally occupied by agriculture.

The Coillte plantation falls within Coillte's Mid-West Business Area Unit (BAU) Strategic Plan. The Mid-West BAU, which is one of 6 BAU's in Coillte, covers all areas of County Galway and County Clare. The BAU Strategic Plan sets out the economic, social and environmental strategies and priorities for the long and medium term. The Mid-West BAU consists of 70,222 ha of mostly good productive forest land and also Farm Partnerships. Forest properties are widespread throughout the BAU, with the greatest forest area (approximately 20,000 ha's) being located in the Slieve Aughty mountains and Slieve Bernagh.

There are currently no defined recreational or tourism amenities within or associated with the plantation within the proposed development site. The nearest forest offering recreational amenities is situated on Woodcock Hill, approximately 2.2 km to the southwest of the proposed development site. There are three way marked trails in this forest, one is a moderate looped walk called the Crag Wood Walk and this trailhead also gives access onto the East Clare Way.

15.3.3 Grid Capacity and Electrical Infrastructure

EirGrid is the national electricity Transmission Systems Operator (TSO) in Ireland. In its role as TSO, EirGrid is responsible for the grid infrastructure required to support the development of Ireland's economy. EirGrid's Transmission Development Plan (TDP) 2018-2027 is the plan for the development of the Irish transmission network and interconnection over the ten years from 2018. This ten year plan presents projects that are needed for the operation of the transmission network. The grid developments have been planned to ensure that the intended grid reinforcements facilitate the connection of significant amounts of wind generation.

The plan sets out a number of planned reinforcement projects for the Transmission Network in County Clare, including redevelopment of the 110 kV Station at Ardnacrusha. The development strategy has stated that it is vital that new electricity infrastructure is built to ensure that the region meets the standards required for a safe and secure electricity system and to cater for connecting the electricity generated by the region's huge renewable energy resources.

Ardnacrusha 110kV Substation is situated within the property of Ardnacrusha Power Station located at Parteen close to the Limerick-Clare border. The 110kV substation has recently been upgraded to a new 110kV GIS busbar.

15.3.4 Aviation

Airports are valuable transport, tourism, employment, and business assets for the local and national economy. The development of large energy projects has the potential to impact air service and operations (airports, landing strips, etc.) within a project area. Developments around airports and under flight-paths can constrain operations, either directly where they conflict with safety/operational requirements, or indirectly where they interfere with radar or other navigational aids.

Shannon Airport, one of Ireland's main international Airports and important state economic asset, is located circa 20km south west of the proposed wind farm development site. A desk based review indicates that there are also numerous aerodromes and airfields in the surrounding region.

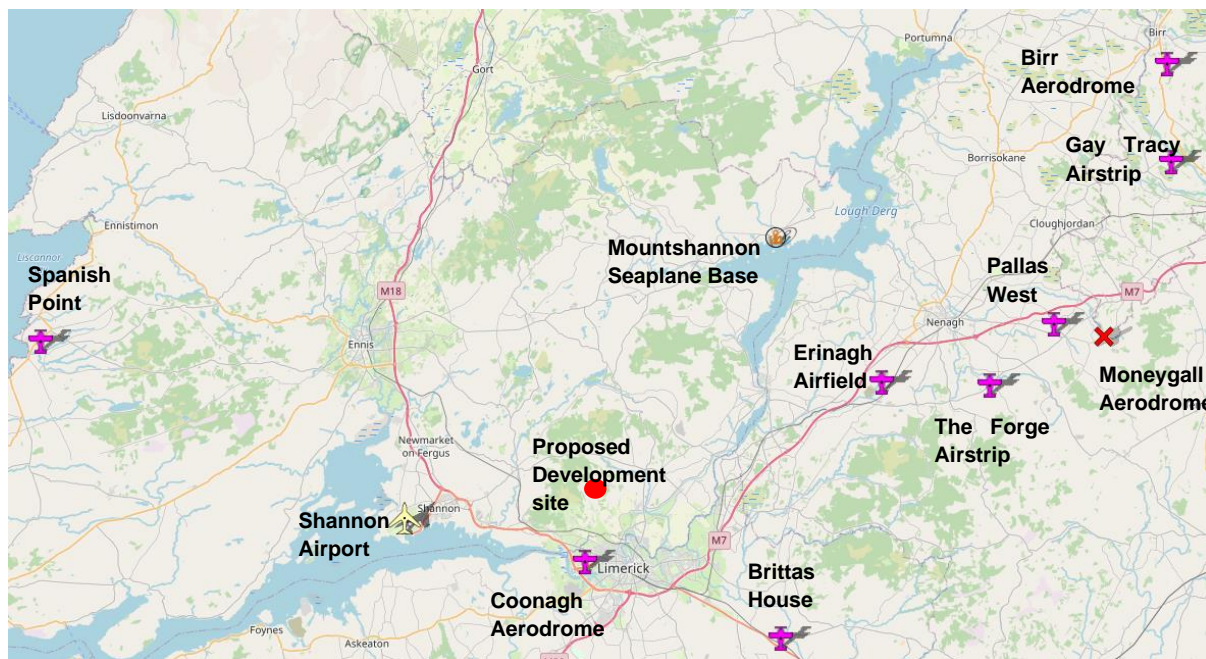


Figure 15-5: Aviation facilities in proximity to the development site

15.3.5 Television and Telecommunications

Telecommunications

Ai Bridges carried out a Ballycar WF Telecommunications Impact Study, refer to **Appendix 15B**, which also identified key television and telecommunications infrastructure in the vicinity of the proposed development. Based on the findings of the consultation process, four Telecom Operators with networks in the vicinity of the proposed development were identified that required a detailed technical analysis.

Figure 15-6 shows a plan view of the four Telecom Operator Networks with respect to the proposed turbines.

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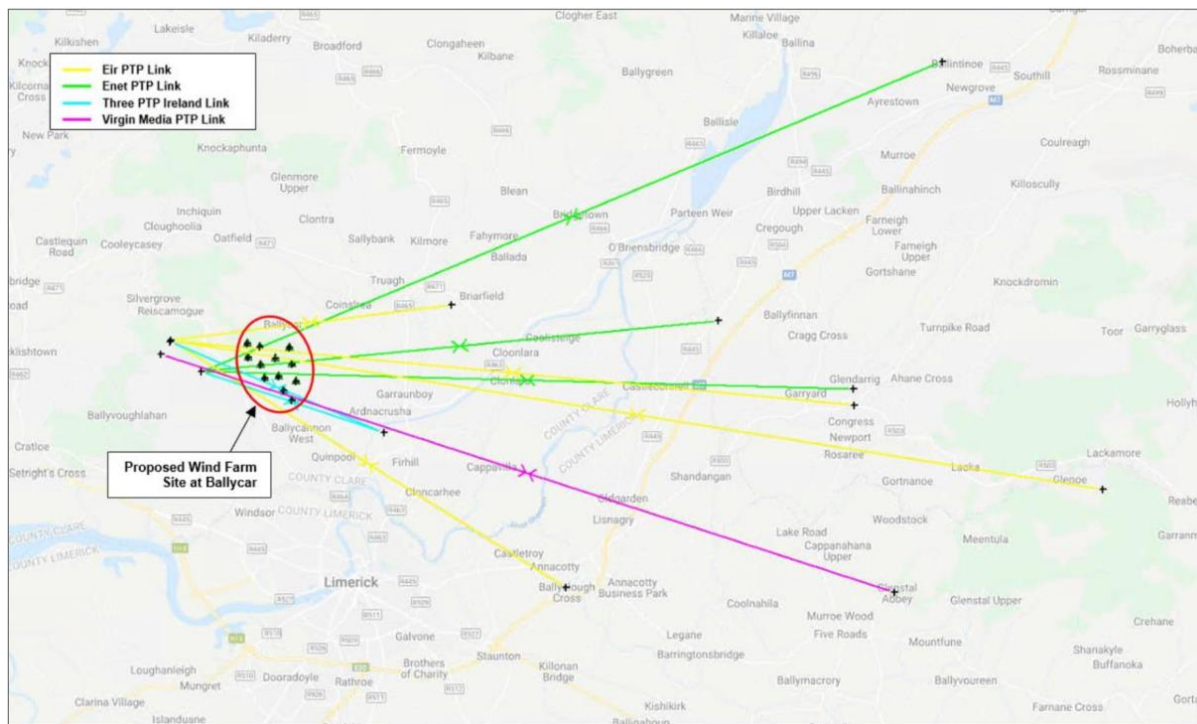


Figure 15-6: Telecom Operator Networks shown relative to the proposed development

The Enet network in the vicinity of the proposed wind farm consists of three Point-to-Point (PTP) microwave radio links. The radio links are listed in **Table 15-4** and a plan view of the Enet network is shown in **Figure 15-7**.

Table 15-4: Enet Radio Links

Link ID	Operator	Link Description
1	Enet	PTP microwave radio link from Woodcock Hill to Newport College
2	Enet	PTP microwave radio link form Woodcock Hill to Birdhill
3	Enet	PTP microwave radio link from Woodcock Hill to Boher National School

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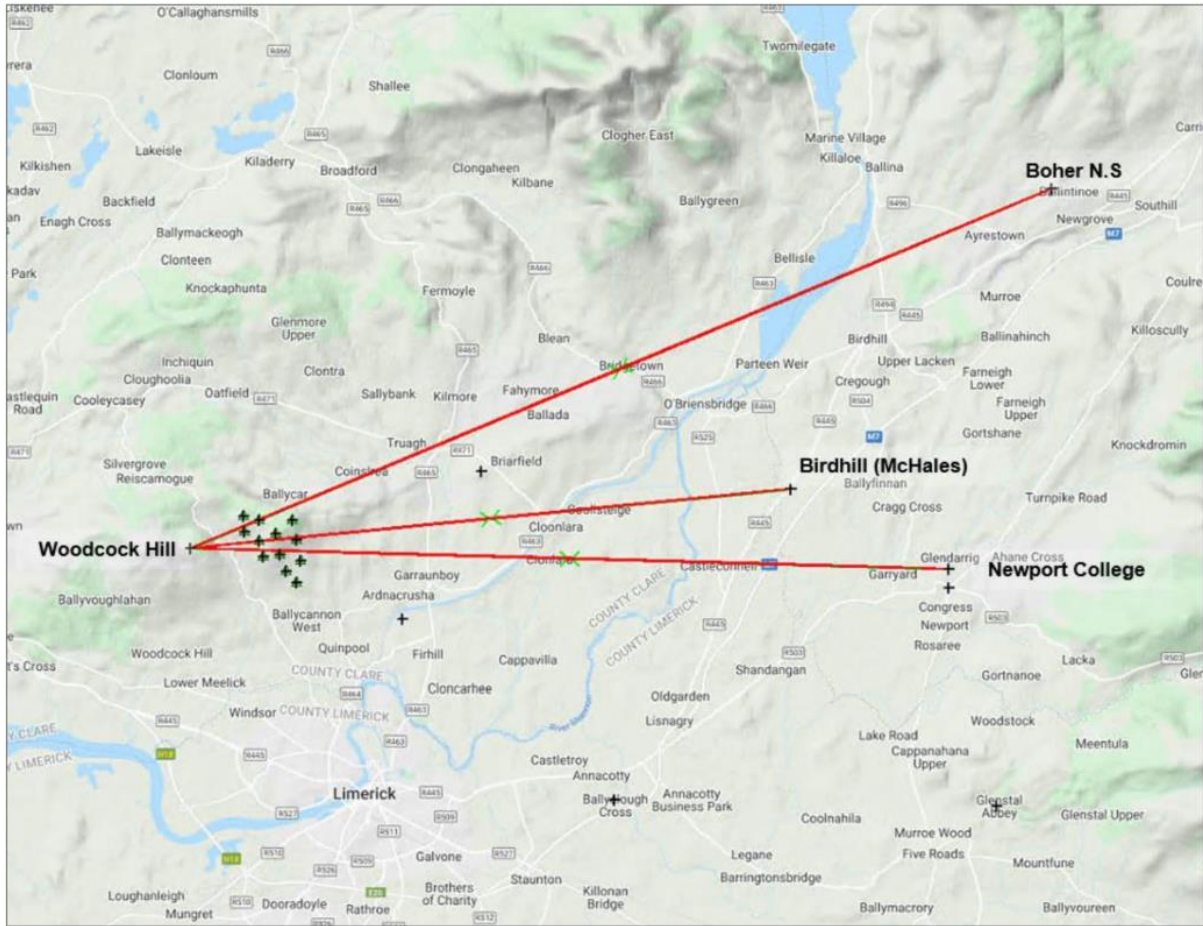


Figure 15-7: Eir Radio Network – Plan View

The Eir network in the vicinity of the proposed wind farm consists of four Point-to-Point (PTP) microwave radio links. The radio links are listed in **Table 15-5** and a plan view of the Eir network is shown in **Figure 15-8**.

Table 15-5: Eir Radio Links

Link ID	Operator	Link Description
1	Eir	PTP microwave radio link from Woodcock Hill to Dromintobin North
2	Eir	PTP microwave radio link from Woodcock Hill to Newport
3	Eir	PTP microwave radio link from Woodcock Hill to Glenoe Newtown
4	Eir	PTP microwave radio link from Woodcock Hill to Woodstown Limerick

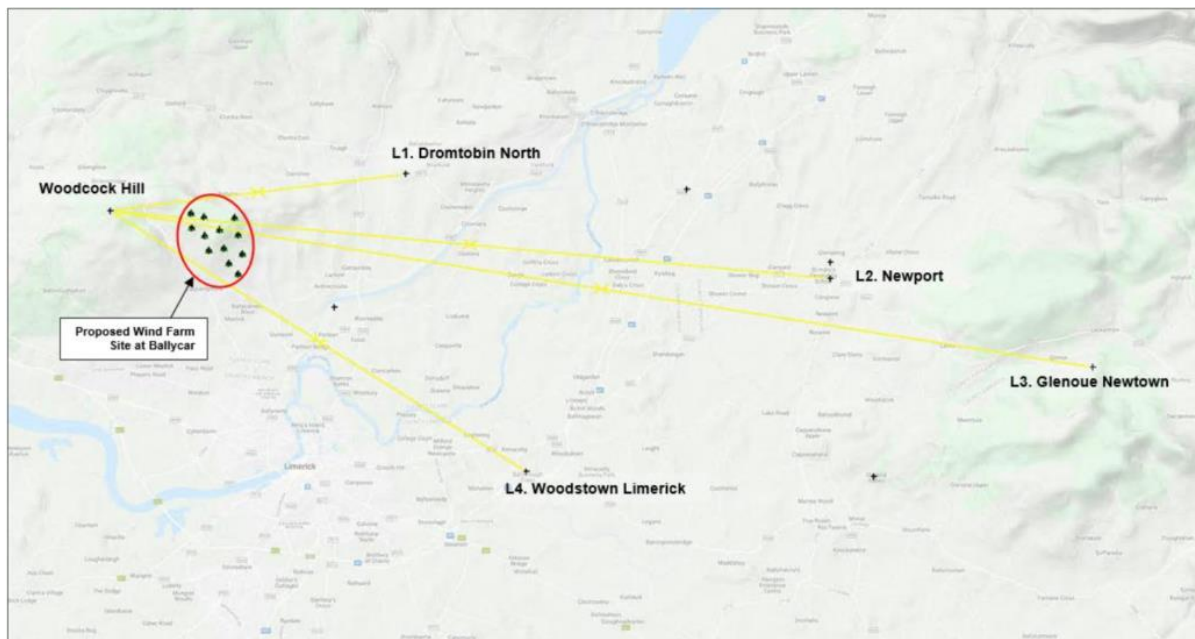


Figure 15-8: Eir Radio Network – Plan View

The Three Ireland network in the vicinity of the proposed wind farm consists of two Point-to-Point (PTP) microwave radio links. The radio links are listed in **Table 15-6** and a plan view of the Three Ireland network is shown in **Figure 15-9**.

Table 15-6: Three Ireland Radio Links

Link ID	Operator	Link Description
1	Three Ireland	PTP microwave radio link from Woodcock Hill Mast #1 to Ardnacrusha
2	Three Ireland	PTP microwave radio link form Woodcock Hill Mast #2 to Ardnacrusha

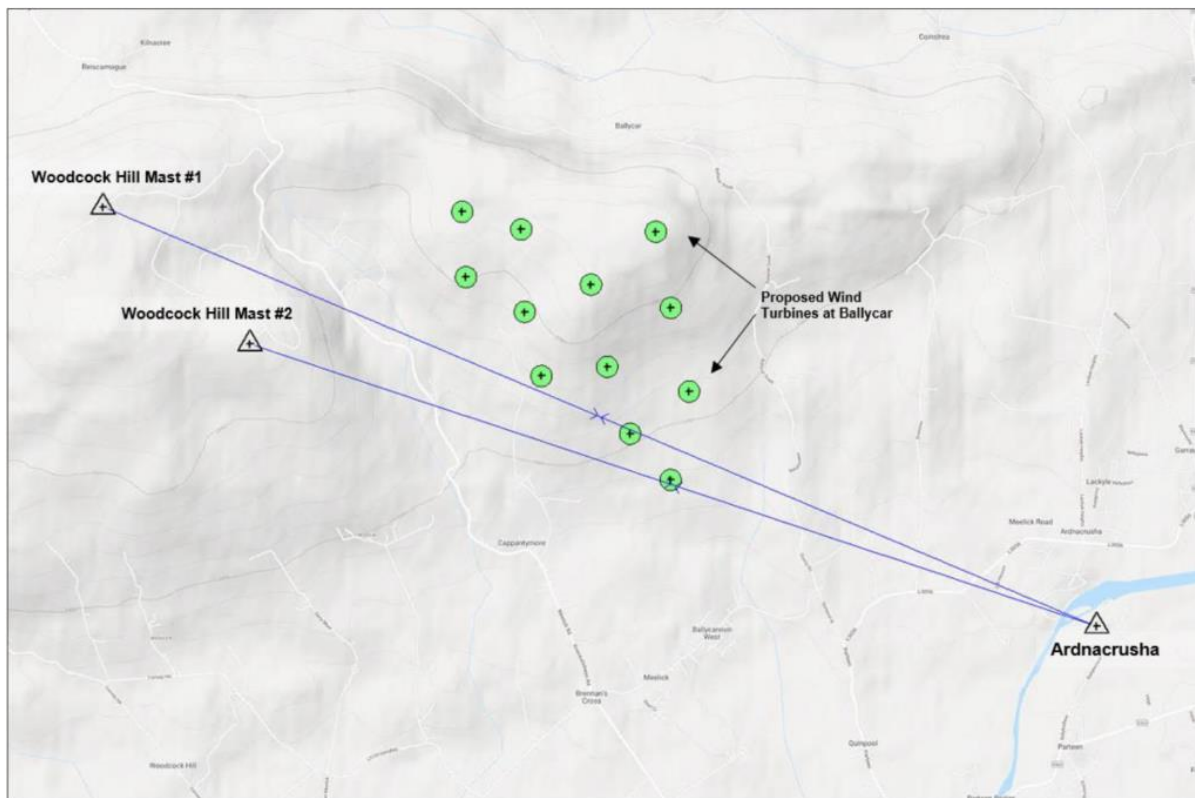


Figure 15-9: Three Ireland Radio Network – Plan View

The Virgin Media network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed in **Table 15-7** and a plan view of the Virgin Media network is shown in **Figure 15-10**.

Table 15-7: Virgin Media Radio Link

Link ID	Operator	Link Description
1	Three Ireland	PTP microwave radio link from Woodcock Hill to Glenstall

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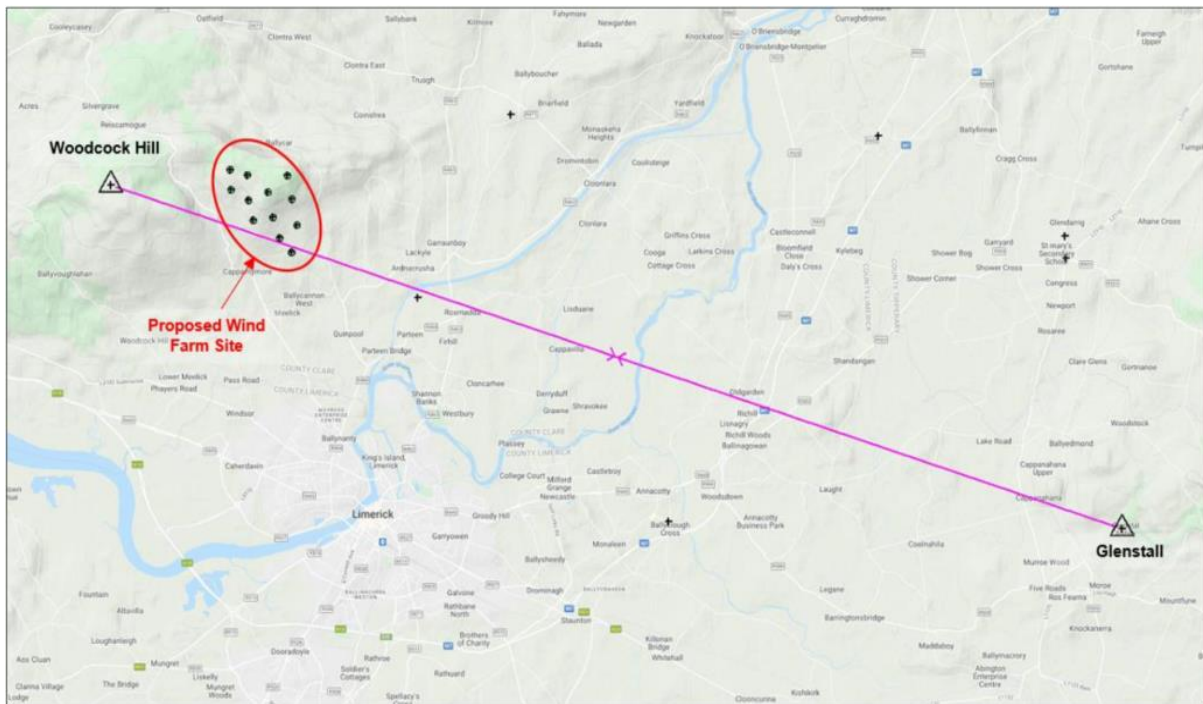


Figure 15-10: Virgin Media Radio Network – Plan View

Existing Telecoms Duct Infrastructure

According to Eir’s Fibre Broadband Checker¹, Eir Fibre Broadband is available within the wider area. There are no Eir telecom ducts within the footprint of the proposed wind farm, substation or grid connection, refer to **Figure 15-11**.

Mapping of the existing telecoms infrastructure has been sourced from the eMaps Open Eir Civil Engineering Infrastructure Service which enables users to view and request maps of telecoms infrastructure.

¹ <https://www.eir.ie/broadband/coverage-map/>



Figure 15-11: Existing Telecom Duct Infrastructure (Source: Eir Maps)

Television

RTE's analogue service was turned off in October 2012 and was replaced by a new Digital Terrestrial Television (DTT) service, commonly known as Saorview TV. The digital Saorview service is still provided from the large RTE transmission sites and a number of new transmission sites have also been built. A review of the Saorview coverage map indicates that TV reception in the area is principally received from the following transmitters:

- Areas north and west of the site primarily receive TV reception from the northwest via the transmitter at Maghera, County Clare. There are some locations however, including Feakle receiving reception from the south via the 2RN Transmitter at Mullaghanish, County Cork.
- Areas east and southeast of the site primarily receive TV reception from the southeast via the transmitter at Woodcock Hill, County Clare or the transmitter at Mullaghanish, County Cork.
- Areas to the east and northeast of the site primarily receive TV reception from the east via the transmitter at Ballina, County Clare.

The Saorview coverage map also indicates that SAORVIEW coverage is currently a challenge in some areas north east of the development site, including in the vicinity of Broadford, Clongaheen west, Kilbane.

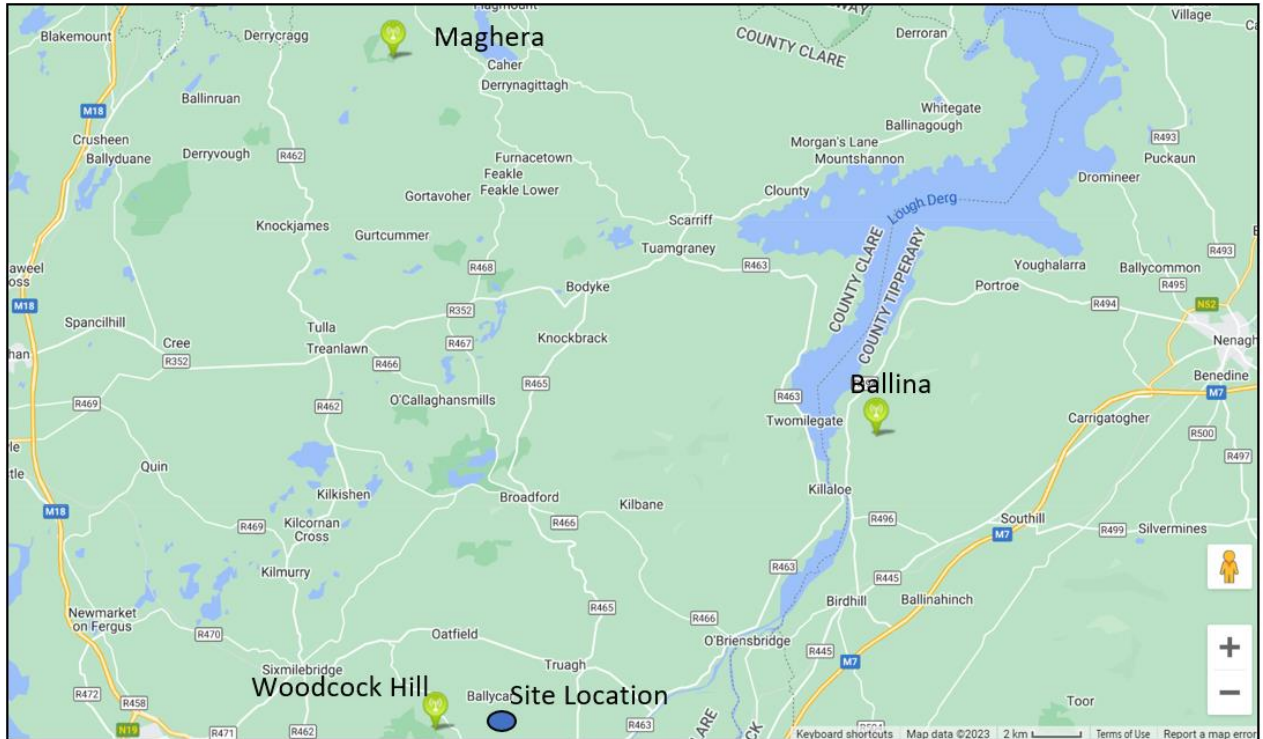


Figure 15-12: TV transmitters in proximity to the proposed wind farm site. Source: <https://saorview.ie/en/check-coverage/>

15.3.6 Gas

Based on information from Gas Networks Ireland (GNI), there are no gas transmission lines within the wind farm, substation or grid connection route (GCR), refer to **Figure 15-13**.

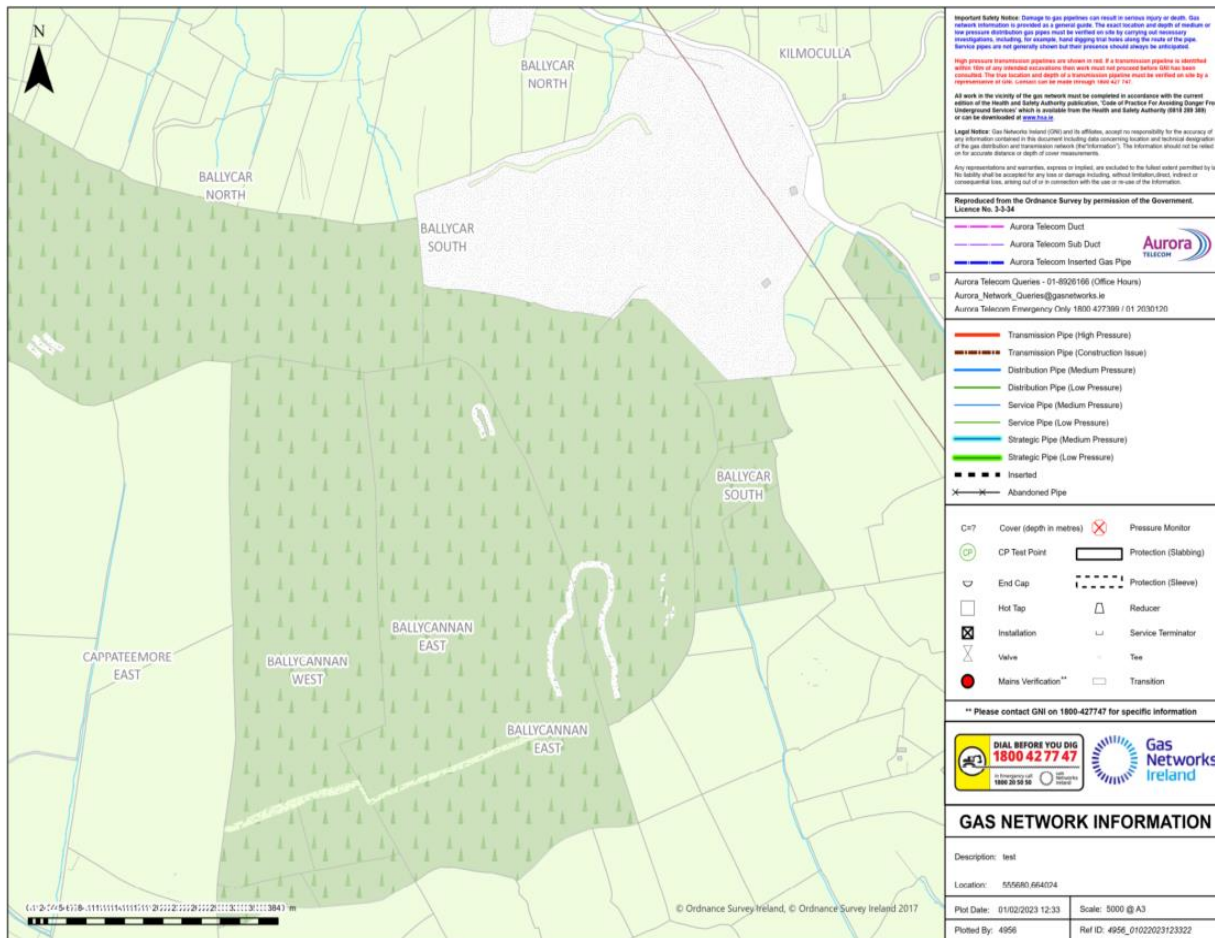


Figure 15-13: Gas Infrastructure Map at Ballycar Wind Farm

15.3.7 Water and Wastewater

Existing Water Infrastructure

There are no existing watermains within the footprint of the proposed wind farm. The grid connection is mainly in a conifer forestry and crosses a 3m section of public road. There are no known or surveyed water services on this road.

Existing Wastewater Infrastructure

There is currently no wastewater infrastructure within the footprint the subject site or along the public road which the grid connection crosses.

15.3.8 Waste Management

There is currently no waste or construction phase waste infrastructure within the **EIAR** study area.

There is an approved facility located in nearby Tuamgraney which is operated by *Clare Waste and Recycling Ltd.*, a permitted waste company which provides skips for construction, commercial and domestic waste. Furthermore, Enva are located at Smithstown Industrial Estate in Shannon, County Clare and accept hazardous wastes.

15.4 Assessment of Impacts and Effects

15.4.1 Construction Phase

15.4.1.1 Transport Infrastructure

Construction Works Access and Vehicle Routing

The traffic generated by the new development will access the site from the R464 via the L3056 which leads north approximately 2.5km to the local access road L7062. It is assumed that all development traffic will use the assessed junction, as the road to the north beyond the existing quarry narrows to a single lane local access road which is deemed unsuitable for HGV traffic.

For a robust assessment it is also assumed that all staff vehicles will approach the site from the south i.e. using the assessed junction.

It is envisaged that the majority of materials delivered to site will be sourced from the local quarry O'Connell Quarries, situated northeast of the proposed development. However, for the purposes of a robust assessment, traffic volumes associated with the delivery of materials from this quarry have been included as travelling through the assessed junction, which in reality will not be the case.

Turbine Delivery Route Assessment

The routing for the delivery of the wind turbine components is shown in **Figure 15-1** and is fully detailed in **Appendix 2C Turbine Delivery Route Assessment**.

A brief summary of the proposed route is provided below:

- The proposed Wind Turbine Generator (WTG) component delivery route from the port at Foynes County Limerick to the Ballycar Wind Farm site is feasible for all turbine components for the type of turbine proposed.
- The route from Foynes Port to the N18 has already been tested and proven successful by the successful delivery of Vestas V136 turbines to Cloncreen Wind Farm in County Offaly. However, the bottom tower sections and the nacelles may be too high to go through the Limerick Tunnel and would require delivery via the Shannon Bridge in Limerick City. This route has also been assessed and found to be feasible.
- Two options were assessed in terms of transporting turbine blades through Limerick City. Option 1 assessed the route starting from Clonmacken Roundabout via the new Coonagh to Knockalisheen Distributor Road, where works have temporarily ceased, however are due to recommence in Spring 2024. This route is considered suitable for deliveries.
- Option 2 assessed the route from Clonmacken Roundabout and travelling through the Clonmacken Road, Northern Ring Road, Cratloe Road and Kileely Road. This route is considered suitable for deliveries.
- The junction of the L-3056 / R464 at Parteen requires temporary road widening through third party land to the southeast of the junction.
- The local road from the R464 at Parteen to Ballycar is considered feasible for delivery and appears to meet minimum road width requirements for turbine delivery due to the road being used as a haul route for a nearby quarry. No temporary road widenings will be required along the local road to facilitate delivery of turbine towers or blades, as a blade lifter trailer will be utilised.

Traffic Impact Assessment

Full details of the Traffic Assessment calculations and conclusions are available in **Appendix 15C**.

The following sections provide a summary of the assessment and its conclusions.

Hours and Staff

Construction activities for the proposed development are scheduled to take place during the following hours: 7:00 a.m to 7:00 p.m from Monday to Friday, and 8:00 a.m. to 2:00 p.m. on Saturdays. These working hours are subject to confirmation at the beginning of the project, and any potential changes to the hours will be discussed and agreed with Clare County Council.

Works along public roads will be from 9:00 a.m. to 5:00 p.m. Monday to Friday and 9:00 a.m. to 2:00 p.m. on Saturdays. A permit for moving abnormal loads will be sought from An Garda Síochána for the delivery of oversized wind turbine components (i.e. blades, nacelles and towers).

During different phases of the construction activities, the number of construction staff involved will vary. At the peak construction period of the wind farm site, an estimated maximum of approximately 60 personnel will be present. Site personnel will arrive at the site prior to 7:00 am and depart after 7:00 pm on weekdays, avoiding peak traffic hours. Assuming an average occupancy rate of 1.00 personnel per vehicle (representing a conservative scenario), the estimated peak staff of 60 will generate 60 no. car and van trips to and from the site each working day. Since on-site canteen facilities will be provided, there will be no need for staff to leave the site during working hours.

Delivery Vehicle Volumes

The 18-month construction phase will require the importation of up to 14,010 loads of construction materials. These construction materials will be imported using standard heavy vehicle delivery trucks with capacities of 10m³ and 20 tonnes. Additionally, there will be 120 loads required for the wind turbine components.

The wind turbine loads will be delivered in consultation with Clare County Council, Limerick City and County Council and An Garda Síochána, during off-peak periods. The 120 delivery vehicles will be required for the 12 turbines. This could result in temporary delays for other traffic during off peak delivery periods.

The proposed development will have 60 no construction personnel on site during the peak of construction activity. It is conservatively assumed that staff will arrive and depart at a rate of 1 vehicle per person, will all travel through the junction onto the R464 from the site in the AM peak hour and will all travel through the junction onto the R464 from the site in PM peak hour. This assumption is precautionary as staff will arrive and depart based on the working hours of 07:00 to 19:00 from Monday to Friday. Peak traffic was noted as 07:45-08:45 and 16:45-17:45.

120 no. HGV deliveries will be associated with the delivery of the turbines, nacelles and blades. These will be spread across 3 months i.e. 60 working days and will be isolated from other daily traffic movements. 4 no. HGV movements per day are therefore associated with the delivery of turbines, nacelles and blades. These movements will all access the site from the south-west direction off the R464 and exit the junction towards the south-west direction upon return.

Approximately 252 (two way) no. HGV movements per day are associated with the delivery of other construction materials during the peak construction period. This level of traffic is expected only for a period of approximately 2 weeks during the construction stage associated with concrete pours for the turbine foundations. These movements are not expected to impact the local road network due to the proximity of the source quarry to the development site, however it is conservatively assumed that these movements will pass through the assessed junction. This accounts for the delivery of the representative quantity of materials from an alternative quarry.

Material deliveries will be spread across the working day and the peak hourly traffic will be 18 no. HGV deliveries to and from the site.

Volume/Capacity ratios

On the basis of the TII Rural Road Link Design, for predicted 2026 AADT volumes with the TII central growth scenario, in combination with the cumulative proposed development, the estimated rural road link AADT volume/capacity ratio for the R464 in the vicinity of the proposed development site is provided in **Table 15-8**.

Table 15-8: Predicted 2026 R464 TII Rural Road AADT Volume/Capacity Ratio with TII High Growth and Peak Construction Traffic

Road	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R464	7,791	8,600	90.5%

The R464 would continue to operate within its estimated rural road link AADT capacity, for the predicted 2026 AADT volumes. In a worst scenario, 100% of the generated development traffic will make use of the junction between the R464 and the L3056. It is assumed that all development traffic will use the assessed junction, as the road to the north beyond the existing quarry narrows to a single lane local access road which is deemed unsuitable for HGV traffic. For a robust assessment, it is also assumed that all staff vehicles will approach the site from the south i.e. using the assessed junction.

TII guidance does not provide specific rural road link capabilities in any of the aforementioned documents for road carriageway widths less than 6.0 metres. Therefore, a capacity assessment was deemed necessary to evaluate the impact of the changes in traffic during peak construction stage.

As the proposed development is expected to commence construction in 2026, the projected 2026 traffic flows can be calculated using TII's Central Growth Factor for County Clare. Based on the traffic levels expected from the proposed development, the impact on the junction can be determined, as shown in **Table 15-9**. This considers figures for anticipated traffic from the scheme during the public network peak, in conjunction with peak hour traffic counts.

Based on the 2022 traffic data obtained and the trip data associated with the site during the peak construction phase, the proposed development will affect the functionality of the junction.

This assessment is highly precautionary and based on 100% of the traffic (including materials delivery) using the assessed junction. As outlined, it is envisaged that materials will be sourced from the local quarry and therefore the associated traffic movements with these will not use the assessed junction, as they will enter the site from the north, approximately 1km from the quarry.

This road currently experiences no congestion, and the below figures indicate that the increase in traffic exceeds the TII threshold of 10% where congestion does not exist (based on 100% of traffic using the junction).

Junction modelling was carried out for the existing T-junction in order to assess the traffic impact generated by the proposed development for future scenarios.

Table 15-9: Traffic Impact on Assessed Junction

Road		AADT Vehicles		AADT Capacity (Vehicles)		AADT Volume/Capacity Ratio	
2026 Projected Traffic		Traffic from Development		Increase in Traffic		TII Threshold of 10%	
AM	PM	AM	PM	AM	PM	AM	PM
827	763	123	213	13.9%	11.8%	Above	Above

Capacity Analysis

ORS carried out capacity assessments on the existing T-junction between the R464 and the L3056, refer to **Figure 15-3**, for the following three scenarios:

- Base-year: 2022 traffic flows modelled according to traffic counts in May 2022.
- Do-nothing: modelled without the intervention of the proposed development. For this analysis, the traffic counts were factored by using the TII’s Growth Factor for the design years 2023 (current year), 2026, 2031 and 2041.
- Do-something: the impact of the traffic generated by the proposed development was added to the design years of 2026, 2031 and 2041.

The results of the PICADY (Priority Intersection Capacity and Delay) software analysis for the junction concluded that the assessed junction will operate satisfactorily, well within capacity in the long term for the years listed above. Therefore, it can be concluded that the priority T-junction off the R464 will perform satisfactorily in the future and the development traffic will have minimal impact on the surrounding road network.

Road Pavements

Heavy vehicle traffic volumes generated by the proposed development construction could result in damage to existing and proposed road pavements on public roads, including at vehicle turning, accelerating and decelerating locations. Road pavements will be regularly monitored and reinstated in accordance with the requirements of Clare County Council.

Impact Summary

From a transportation planning perspective, and on the basis of the EPA Guidelines, the traffic assessment concluded that the construction phase of the proposed development will likely have a **slight, short-term, negative** effect, over the 18-month construction period with isolated, localised peaks of **brief** but **moderate** effect.

The construction stage of the proposed development will not significantly impact the future operational capacity of the assessed junction. The peak development traffic is not anticipated to coincide with the peak traffic hour on the public network.

15.4.1.2 Forest Resources

The main effect on the existing forest resource will be the requirement for permanent tree felling to facilitate the wind turbines and associated infrastructure so that both energy and timber production can occur on the site. Overall felling of approximately 15.97 ha of forest will be required. The amount of forest that will be lost as a result of the development is minimal and will be insignificant relative to the size of the forest resource nationally, regionally and locally.

All tree felling will be undertaken in accordance with a tree felling licence, using good working practices as outlined by the Department of Agriculture, Food, and the Marine (DAFM) Standards for Felling and Reforestation (2019). These standards deal with sensitive areas, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel, and machine oils. All conditions associated with the felling licence will be complied with.

The applicant commits to not commencing the project until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

Conventional felling has taken place and will continue to take place at the site independent of the wind farm proposal. This felling has and will continue to take place in accordance with strict environmental guidelines including the Forestry Guidelines (Department of Agriculture, Food and the Marine, 2019, Standards for Felling and Reforestation). Coillte must adhere to strict environmental conditions order to maintain its Forest Stewardship Council (FSC) Certification and the PEFC Council (Programme for the Endorsement of Forest Certification schemes). Any felling to facilitate the wind farm construction will continue to operate within the safeguards set out in these guidelines. Similarly replanting activities will be undertaken in accordance with FSC and PEFC Certification practices.

The construction phase of the proposed development will likely have a **neutral, imperceptible and long term** effect on forest resources.

15.4.1.3 Grid Capacity and Electrical Infrastructure

During the process of connecting the proposed development to the national grid, some minor, brief disruption to electrical supply, at a local level, may occur. However, during this process, EirGrid will balance the loading on the network to ensure that no significant disruption occurs and significant effects do not arise.

In the absence of mitigation, the construction phase of the proposed development will likely have a **negative, not significant** and **brief** effect on the grid capacity and electrical infrastructure.

15.4.1.4 Aviation

The only potential effect on aviation associated with the proposed development during the construction phase is during the erection of wind turbines on site. Ballycar Green Energy will agree an acceptable aviation obstacle warning lighting scheme with the Department of Defence and IAA/AirNav Ireland ahead of turbine construction and will supply the coordinates and elevations for built turbines, as is standard for wind farm developments.

The Aviation Impact Assessment & Mitigation report, refer to **Appendix 15A**, noted that during the operational phase there is potential for surveillance radar impacts on the Woodcock Hill Monopulse Secondary Surveillance Radar (MSSR) and the Shannon Airport (Primary Surveillance Radar) PSR from turbines at the proposed development.

Mitigation measures are outlined in **Appendix 15A** which will prevent any adverse effects.

In the absence of mitigation, the construction phase of the proposed development could have a **negative, moderate to significant** and **short-term** effect on aviation.

Due to the sub-surface nature of the proposed grid connection infrastructure, there will be no effects on aviation.

15.4.1.5 Television and Telecommunications

The potential for electromagnetic interference from wind turbines occurs only during the operational phase of the development and therefore will not occur during the construction phase.

There are no telecom ducts within the proposed wind farm.

Best practice measures outlined will still be carried out during excavations. In the absence of mitigation, the construction phase will likely have a **negative, not significant** and **short-term** effect.

15.4.1.6 Gas

The proposed development does not require a connection to gas and there are no existing gas lines in the vicinity.

There will be no effects on gas infrastructure during construction.

15.4.1.7 Water and Wastewater Infrastructure

No public water or wastewater utility infrastructure is required at the wind farm site.

Water needs for construction activities will be low and limited to truck washing, wheel wash, dust suppression and sanitary facilities. It is proposed that this water requirement will be sourced from on-site rainwater collection systems and settlement ponds. It is estimated that up to approximately 3,000 litres per day of potable water will be required during peak construction for construction employees. It is proposed that this water requirement will be imported in bulk water tanks.

During the construction time period, sanitary wastewater, estimated to be 3,000 litres per day, will be collected in portable toilets. Disposal of sanitary wastes will be managed through a contract with a licenced waste contractor.

Given that the proposed development is not in the footprint of existing water/wastewater infrastructure, adverse effects to existing water infrastructure along the grid route is not likely.

In the absence of mitigation, there is potential for proposed development to have a **neutral, imperceptible** effect on existing water/wastewater infrastructure.

15.4.1.8 Waste Management

The use of permitted waste contractors and authorised waste facilities is essential to appropriately manage waste to prevent adverse environmental effects. All waste will be dealt with in accordance with regional and national legislation. Resources and efficient waste management practices will be utilised to prevent adverse effects on the environment.

The principle objective of sustainable resource and waste management is to use material resources more efficiently, to re-use, recycle and recover material and to reduce the amount of waste requiring waste disposal. The value of products, material and resources is maintained in the economy for as long as possible such that the generation of waste is minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy. Resource efficiency techniques will include the following:

- Excavated spoil will be resourced efficiently on site and will be reused for the backfilling, landscaping, and restoration around wind farm infrastructure such as turbines and hardstands. Dedicated spoil storage areas and a borrow pit are proposed within the site. These will be used for generating material for the construction of access tracks and hardstands and for spoil storage.

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- It is not envisaged that any soil will be removed from the site, however in the event that removal of minimal quantities are required, these will be treated as Article 27 by-product (a non-waste) or treated to comply with Article 28 if practicable and recycled if possible.
- Spoil will also be stored around the turbines to a maximum height of one metre (1m). The felled areas around the turbines have been identified as a potential additional area that will be used to store material; however, priority will be given to restoration of the borrow pit and the dedicated spoil storage areas.
- Berms will be formed along sections of access tracks and hardstands that will act as a physical edge protection measure to prevent vehicles falling off where a drop off greater than 1m exists from the track / hardstand edge. Spoil generated onsite will be used to create these berms.
- Approximately 165,000m³ of stone won from the borrow pit will be reused on site.

Table 15-10: Spoil Excavation and Material Volumes

Item	Unit	Quantity
Excavations		
Total Excavation Volumes	m ³	418,300
Excavated Material Stored or Reused Onsite	m ³	402,000
Excavated Material Removed from Site	m ³	16,300*
Imported Material		
Total Volume of Stone Required	m³	265,150
Imported Stone	m ³	100,150
Site Won Stone	m ³	165,000
Concrete and Steel		
Concrete for bases (12 @ 900 m ³ each)	m ³	10,800
Concrete for substation and met mast foundations	m ³	250
Concrete for cable route	m ³	281,450
Reinforced steel for turbine bases (12 @ 100 tonnes each)	tonnes	1,200

* Where feasible, this material will be reused on site as preference.

Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, cable wires, shuttering timber and building materials. This waste will be stored in the construction compound and collected at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best

practice procedures at an approved facility. Plastic waste will be taken for recycling by an approved contractor and disposed or recycled at an approved facility. Hazardous materials, such as fuels and lubricant oils, used during construction that require disposal will be disposed of in accordance with all applicable laws and regulations. Domestic type waste generated by contractors will be collected on site, stored in an enclosed skip at the construction compound and disposed of at a licensed landfill facility.

There is an approved facility located in nearby Tuamgraney which is operated by *Clare Waste and Recycling Ltd.*, a permitted waste company which provides skips for construction, commercial and domestic waste. Furthermore, Enva are located at Smithstown Industrial Estate in Shannon, County Clare and accept hazardous wastes.

The use of non-permitted waste contractors or unauthorised facilities during construction could give rise to inappropriate management of waste and result in adverse environmental impacts in the form of waste pollution. If waste material is not stored correctly and managed, this could lead to litter issues on site. Any litter issues on site could potentially lead to the presence of vermin on site or at adjacent sites which would likely cause a **negative, short-term, slight** effect on the local environment.

15.4.2 Operational Phase

15.4.2.1 Transport Infrastructure

During the operational phase, there will be periodic maintenance on site. This would generate relatively low volume of vehicles, including occasional heavy vehicles. The Traffic Assessment, refer to **Appendix 15C**, concluded that the proposed development would not significantly impact the future operational capacity of the assessed junction, refer to **Figure 15-3**.

On the basis of the EPA Guidelines, the proposed operational phase would have **imperceptible to not significant negative** traffic effects.

15.4.2.2 Forest Resources

The wind farm development operational phase will not impede or deter either existing or future use of the local forest resources for recreational activities. It is likely that the improvements to the on-site forest tracks would provide opportunities for further development and use of some of the forest areas for recreation, during the operational phase. Therefore, there will be **no significant negative** effects on the local forest resources for any future recreational use.

Any felling to facilitate the wind farm during the operational phase will continue to operate within the safeguards set out in the relevant guidelines.

15.4.2.3 Grid Capacity and Electrical Infrastructure

During the operational phase, the Ballycar wind farm project will complement the national grid development strategy and help in contributing to the regions expected overall wind generation. The proposal will assist in meeting increases in electricity demand nationally by exporting electricity into the electricity market. It will contribute to ensuring that adequate electricity supplies are available to support economic activity and growth in a manner fully compatible with Government energy and environmental policies.

The wind farm proposal does not pose a risk to the local electricity infrastructure. There is currently sufficient capacity in place to accommodate the additional renewable energy to be generated.

The proposed development will **likely** have a **positive, slight and long term** effect on the existing grid capacity and electrical infrastructure.

15.4.2.4 Aviation

Due to the presence of tall structures, it is possible that the proposed development could interact with aviation operations. Ballycar Green Energy Ltd. will agree an acceptable aviation obstacle warning lighting scheme with the Department of Defence and IAA/AirNav Ireland ahead of turbine construction and will supply the coordinates and elevations for built turbines, as is standard for wind farm developments.

Following consultation with AirNav Ireland, which commenced in January 2022, concerns were raised in relation to:

- Instrument Flight Procedures (IFP) surfaces;
- Navigational Aids/ISL Flight Inspection surfaces;
- Surveillance Systems.

The Ballycar Wind Farm Aviation Impact Assessment and Mitigation report in **Appendix 15A** details the full consultation with AirNav Ireland, concerns raised and mitigation measures recommended during the operational phase of the proposed development.

The following recommendations have been made to remediate the concerns raised by the Air Navigation Service Provider (ANSP) in relation to surveillance radar effects on the Woodcock Hill Monopulse Secondary Surveillance Radar (MSSR) and the Shannon Airport (Primary Surveillance Radar) PSR:

- The technical documentation provided by the manufacturer (Thales) of the two systems provides assurance that mitigation for the Ballycar Windfarm is possible. Cyrrus would recommend that an onsite condition survey is carried out by Thales on both the Shannon Airport and Woodcock Hill systems to confirm their current operational state and ascertain whether updates or upgrades would be required.
- A limited operational flight trial may also be prudent at this stage to provide a baseline of the current systems coverage over the area of the proposed Windfarm.
- Once the windfarm is built, the systems may require minor optimisation by Thales. Once completed, a further Flight Check would be recommended to confirm the systems performance was acceptable over the Windfarm area.

In the absence of the mitigation, effects to aviation from the proposed development would likely be **negative, moderate to significant** and **long term** for the duration of the operational phase.

Due to the sub-surface nature of the proposed grid connection infrastructure, there will be no effects on aviation. Correspondence from AirNav Ireland (**Appendix 1B**) outlines their support in principle in relation to the proposed development.

15.4.2.5 Television and Telecommunications

As is standard practice, a signed Protocol between the developer and RTE will be in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.

In terms of telecommunications, the Ballycar Wind Farm Telecommunications Impact Study, refer to **Appendix 15B**, concluded the following:

- Based on the findings of the consulting process, there were four Telecom Operators with networks in the vicinity of the proposed wind farm that required a detailed technical analysis. A 2D and a 3D network analysis was carried out on each of the Telecom Operator Networks, the results of which found that only

three of the Telecom Operator Networks could be impacted by the proposed wind farm development. (i.e Enet, Eir and Three Ireland).

- Extensive field survey and software modelling analysis was carried out to determine viable mitigation measures to offset the impact of the proposed wind turbines. The mitigation measures that were assessed included the provision of a relay mast and the provision of alternative relay links. Consultations with each of the three impacted telecom operators were carried out and mitigation measures were agreed with the effected telecom providers.

In the absence of mitigation, the proposed development could potentially have a **negative, slight and long term** effect on telecommunications in the local area.

15.4.2.6 Gas

The proposed development does not require a connection to gas, therefore **no effects** to existing gas infrastructure are anticipated during the operational phase.

15.4.2.7 Water and Waste Infrastructure

Potable water for during the operational and maintenance phase is estimated to be approximately 60 litres per day. This water will be supplied as bottled water. The volumes of water required are minimal and would have a negligible impact on the water supply utilities.

During the operational phase, wastewater from welfare facilities on site, estimated to be approximately 60 litres per day, will drain to integrated wastewater holding tanks associated with the toilet units. The stored effluent will then be collected on a regular basis from site by a permitted waste contractor and removed to a licenced waste facility for treatment and disposal. The volumes of wastewater requiring disposal are minimal and would have an imperceptible effect on the capacities of external treatment facilities.

The operational phase of the proposed development will likely have a **neutral, imperceptible and long-term** effect on the existing water and waste infrastructure.

15.4.2.8 Waste Management

During the operational phase, minimal amounts of solid waste will be generated, which will be collected onsite and transported to a licensed disposal or recycling facility by a waste hauling contractor. Hazardous materials, such as gear and hydraulic oils used in the operation of the wind turbines and mineral oils used in transformers, will be disposed of in accordance with all applicable laws and regulations.

The types of wastes to be generated would be similar to established construction waste streams and would not require unusual or new treatment options. Waste volumes are not likely to be significant as to require new permitted treatment, storage and disposal facilities.

The use of non-permitted waste contractors or unauthorised facilities during operation could give rise to inappropriate management of waste and result in adverse environmental effects in the form of waste pollution. If waste material is not stored correctly and managed, this could lead to litter issues on site. Any litter issues on site during the operational phase could potentially lead to the presence of vermin on site or at adjacent sites which would likely cause a **negative, long-term, slight** effect on the local environment.

15.4.3 Decommissioning Phase

The removal of the wind turbines during any decommissioning phase would be on a similar basis to the delivery of the wind turbines for the construction phase, with similar LGV traffic volumes and impacts. The total volume of HGV traffic will be significantly reduced compared to the construction period.

The wind turbines proposed as part the development are expected to have a lifespan of approximately 35 years and ongoing research shows that this is likely to increase with improvements in turbine technology, site design and maintenance measures. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to fulfilment of planning requirements at that time, or the proposed development may be decommissioned fully. It is likely the substation will remain in place and will be taken in charge by the system operator, after the wind farm is connected to the national electricity grid.

Upon decommissioning of the proposed development, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that would be used for their erection. The turbine will most likely be removed from site using the same transport methodology adopted for delivery to site initially. On decommissioning about 85% of turbine components, including steel, copper wire, electronics and gearing, can be recycled or reused. The fibreglass blades however are difficult to recycle and currently are generally disposed of by landfill. For the Ballycar wind farm this would equate to approximately 840 tonnes of materials requiring disposal. This would be a **moderate, negative** effect of the development and likely to require provision of new treatment technologies and/or facilities.

Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. 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 environment emissions such as noise, dust and/or vibration.

Site access tracks will be left in-situ, as appropriate. If it were to be confirmed that the tracks were not required in the future for any other useful purpose, they could be removed where required. Underground cables will be removed, and the ducting left in place. Overall, the effect of the decommissioning phase is assessed to be likely **slight** and **negative**, and of **short-term** duration.

15.4.4 Do-Nothing

In the 'Do-Nothing' scenario, the proposed development will not be constructed and there will be no alteration to existing land-uses, no generation of waste, traffic generation and there will be no additional effects on the public road network or on existing access arrangements.

15.4.5 Cumulative Impacts and Effects

Each of the projects listed were considered with respect to potential cumulative impacts on population and human health.

Small scale projects listed in **Section 2.3.21 of Chapter 2 Description of the Proposed Development** will not result in cumulative impacts and can be discounted from the impact assessment.

The larger scale projects within 25km of the proposed development consist of renewable projects as listed below:

- Limerick Blow Moulding, Parteen (single turbine) (existing) (permission for retention and changing of position granted);
- Vistakon (single turbine) (existing);

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- Castlewaller (Permitted but not constructed);
- Carrownagowan (Permitted under Judicial Review);
- Carrownagowan Wind Farm Grid Connection (Submitted); and
- Fahy Beg (Refused, Appealed to An Bord Pleanála).

The closest permitted (approved) but not yet constructed wind farm of significant scale (Carrownagowan) to Ballycar is at a distance of approximately 12km. Fahy Beg Wind Farm (refused by Clare County Council but appealed to An Bord Pleanála) is located approximately 8.5km to the north east.

The nearest proposed solar farm developments are Drummin Solar Farm (Permitted but not constructed), c.2km east, and Ballyglass Solar Farm (Permitted but Appealed to An Bord Pleanála) (c.4km east).

During the construction phase of the proposed development, there is a brief stretch along the local road L7062 where construction traffic from the proposed Fahy Beg development (i.e. currently under Appeal with ABP) might coincide. In the event that the projects overlap, it is worth noting that there will be no significant cumulative impact. While the likelihood of both developments operating at peak construction simultaneously is low, this local road typically experiences very light traffic and has the capacity to accommodate a temporary increase if necessary.

The routes associated with the solar farm developments (Drummin and Ballyglass) do not coincide with construction traffic generated by the proposed development and therefore no cumulative impacts are expected. Consultation will be undertaken with Clare County Council and local residents to ensure that cumulative effects with other projects would be minimised.

It is proposed forestry operations within the planning boundary will cease during the construction phase (apart from those required as part of the development) and will resume post commissioning of the wind farm.

The total amount of felling proposed for the project is 15.97 hectares. The Applicant commits to not commencing the project until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

Due to the absence of other tall structures in the wider vicinity of the proposed development and given that the nearest permitted but not yet constructed wind farm of scale is approximately 12km from the subject site, it is assessed that there is no likelihood for the proposed development to have any significant effects on aviation, in combination with other existing, permitted or proposed developments.

The proposed development is not assessed as likely to result in any cumulative effects on resources or utility infrastructure, either individually or in combination with other existing permitted or proposed developments.

The proposed Ballycar wind farm development would positively cumulate with other wind farm developments in the region to advance in delivering local, regional, and national Green Energy targets.

15.5 Mitigation

15.5.1 Construction Phase

15.5.1.1 Transport Infrastructure

The proposed development would generate an increase in the numbers of heavy vehicles using the local road infrastructure. The following measures will be undertaken by the appointed contractor to ensure a safe and regulated traffic management system is enforced:

- Pre-construction and post-construction surveys will be carried out to ensure the structural integrity of the proposed haulage route road network. Repairs will be carried out on the public roads, as necessary, during the construction phase, to ensure that the condition does not deteriorate below a standard that could affect the use of the roads, as required;
- The appointed contractor will liaise with An Garda Síochána and Clare County Council during the construction phase. The appointed contractor will recognize that other external factors such as severe weather events can affect traffic flow close to the project and will endeavour to minimise the effect of the works on traffic in the planning of and programming of the works at construction stage.
- Heavy vehicles traffic volumes generated by the proposed development construction could result in damage to existing and proposed road pavements on public roads, including at vehicle turning, accelerating and decelerating locations. Road pavements will be regularly monitored and reinstated in accordance with the requirements of Clare County Council.
- A strict protocol will be ensured for HGV drivers to follow the designated haulage route and timing restrictions, as detailed;
- Haulage traffic will share the same route with local residents, tourists, and other road users, which would present risks. Advance warning will be given to the local residents and other users (i.e. cyclists) for specific times when large volumes of HGV traffic may occur;
- All signage relating to the proposed construction traffic routes for construction traffic will be agreed with Clare County Council;
- A well planned and executed delivery programme avoiding peak traffic on typical days will be ensured (i.e. local school start and finish times);
- Adequate parking will be provided on site for both employees and visitors to ensure parking will not occur on the public road;
- A road sweeping vehicle will be provided as required to remove any mud that is deposited on the local road in the vicinity of the site access; and
- Wind turbine loads will be delivered in consultation with Clare County Council and An Garda Síochána, during off-peak traffic periods.

15.5.1.2 Forest Resources

The effect of the wind farm on forest operations and the potential effect of forestry felling on the environment will be controlled as it currently is, by strict environmental controls, practices and guidelines as described by the relevant Forest Service Guidelines. Any tree felling required to facilitate the construction and operation of the wind farm will be kept to a minimum and under the terms of felling licences. Obligations to replant clear-fell areas will be fulfilled.

The proposed project will not result in any significant adverse effects on forest resources requiring additional mitigation.

15.5.1.3 Grid Capacity and Electrical Infrastructure

The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with ESB Networks.

All works in the vicinity of ESB Networks infrastructure will be carried out in ongoing consultation with ESB networks and will be in compliance with any requirements or guidelines they may have including procedures to ensure safe working practices are implemented when working near live overhead/underground electrical lines.

15.5.1.4 Aviation

Ballycar Green Energy Ltd. will agree an acceptable aviation obstacle warning lighting scheme with the Department of Defence and IAA/AirNav Ireland ahead of turbine construction and will supply the coordinates and elevations for built turbines, as is standard for wind farm developments.

To prevent any interference to surveillance radar to Woodcock Hill MSSR and the Shannon Airport PSR mitigation measures outlined in the Aviation Impact Assessment & Mitigation report will be applied, refer to **Appendix 15A**.

15.5.1.5 Television and Telecommunications

In the event of interference to television and telecommunication services arising from the wind farm development, Ballycar Green Energy are committed to work with telecommunication providers to remedy any issues of interference to affected communication links.

Contractors will be obliged to adhere to good practice measures outlined in the CEMP to prevent any impacts to television and telecommunication services during the construction phase.

15.5.1.6 Gas

No mitigation measures required.

15.5.1.7 Water and Wastewater

All wastewater during the construction phase will be taken off-site by an authorised waste contractor and brought to an authorised waste facility.

15.5.1.8 Waste Management

Resource efficiency will be the responsibility of the contractor and will form part of the construction resource efficiency methods outlined in **Section 15.4.1.8** and thus comply with Circular Economy And Miscellaneous Provisions Act 2022. In the event that there is a requirement for soil to be exported from site, this will be treated as an Article 27 by-product (a non-waste) where practicable or treated to comply with Article 28, and recycled if possible. A Resource Waste Management Plan (RWMP) will be implemented by the appointed contractor.

Where waste is created, it will be managed in accordance with the waste hierarchy in Council Directive 2008/98/EC on waste and section 21A of the Waste Management Act 1996, as amended, as follows: (a)Prevention; (b)re-use; (c)Recycling; (d)Other recovery (including energy recovery); and (e) Disposal.

All waste for offsite treatment/disposal will be stored temporarily in appropriate dedicated storage areas. The areas in which wastes are stored on site will be segregated to prevent material and contaminated surface water runoff entering local surface water drains.

All chemical, hydrocarbon or other controlled wastes will be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required.

All waste to be removed from site will be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice and the site waste management plan as discussed in the **CEMP**, as included in **EIAR Appendix 2A**.

15.5.2 Operational Phase

15.5.2.1 Transport Infrastructure

Traffic associated with the operation and maintenance of the wind farm will be minimal and is not anticipated to have any impact on the surrounding traffic in the long term. No additional mitigation measures are required.

15.5.2.2 Forest Resources

The operational phase of the proposed development will not impede existing or deter existing or future use of the local forest resources, therefore no additional mitigation measures are required.

15.5.2.3 Aviation

To prevent any interference to surveillance radar to Woodcock Hill MSSR and the Shannon Airport PSR mitigation measures outlined in the Aviation Impact Assessment & Mitigation report will be applied, refer to **Appendix 15A**.

Correspondence from AirNav Ireland (**Appendix 1B**) outlines their support in principle in relation to the proposed development.

15.5.2.4 Television and Telecommunications

Following consultation with impacted telecommunications providers, summarised in **Appendix 15B**, alternative relay links will be put in place to prevent telecommunication impacts from the wind farm.

Table 15-11: Telecommunications Mitigation Measures Summary

Operator	Impacted PTP Link	Mitigation Measure	Mitigation Agreed
Enet	One PTP microwave radio link Woodcock Hill to Birdhill	Alternative relay link	Yes
Eir	One PTP microwave radio link Woodcock Hill to Glenoue Newtown	Alternative relay link	Yes
Three Ireland	Two PTP microwave radio links from Woodcock Hill to Ardnacrusa	Alternative relay link	Yes

As standard practice, a signed Protocol between the developer and RTE will be put in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.

15.5.2.5 Gas

No mitigation measures required.

15.5.2.6 Water and Wastewater

All wastewater during the operational phase will be taken off-site by an authorised waste contractor and brought to an authorised waste facility.

15.5.2.7 Waste Management

The operational phase of the proposed development will produce minimal volumes of waste and much less than the construction phase however, where relevant, mitigation measures outlined in **Section 15.5.1.8** and the **CEMP** included in **EIAR Appendix 2A** for the construction phase will also be applied during the operational phase to prevent any adverse impacts from improper waste management.

15.6 Residual Impacts and Effects

The residual effect is the remaining environmental effect after mitigation measures have been applied. **Table 15-12** provides a summary of the residual material asset effects for the proposed development. There are no predicted significant residual effects post mitigation.

Table 15-12: Material Assets Residual Effects

Impact	Effect (Pre-Mitigation)	Mitigation Measures	Residual Effect (Post-Mitigation)
Construction Phase			
Transport Infrastructure	Negative, Slight to Moderate, Short Term and Likely	Refer to Section 15.5.1.1	Negative, Slight, Short Term and Likely
Forest Resources	Neutral, Imperceptible, Long Term and Likely	No Mitigation Measures Required	Neutral, Imperceptible, Long Term and Likely
Grid Capacity and Electrical Infrastructure	Negative, Not Significant, Brief and Likely	Refer to Section 15.5.1.3	Neutral, Imperceptible, Brief and Likely
Aviation	Negative, Slight, Short Term and Likely	Refer to Section 15.5.1.4	Neutral, Imperceptible, Short Term and Likely
Television and Telecommunications	Negative, Not Significant, Short Term and Likely	Refer to Section 15.5.1.5	Neutral, Imperceptible, Short Term and Likely
Gas	No effects	No Mitigation Measures Required	No effects
Water and Wastewater Infrastructure	Negative, Not Significant, Short-Term and Likely	Refer to Section 15.5.1.7	Neutral, Imperceptible, Short Term and Likely
Waste Management	Negative, Slight, Short Term and Likely	Refer to Section 15.5.1.8	Neutral, Imperceptible, Short Term and Likely
Operational Phase			
Transport Infrastructure	Neutral, Imperceptible, Long Term and Likely	No Mitigation Measures Required	Negative, Imperceptible, Long Term and Likely

Ballycar Wind Farm

Impact	Effect (Pre-Mitigation)	Mitigation Measures	Residual Effect (Post-Mitigation)
Forest Resources	Neutral, Imperceptible, Long Term and Likely	No Mitigation Measures Required	Neutral, Imperceptible, Long Term and Likely
Grid Capacity and Electrical Infrastructure	Positive, Slight, Long Term and Likely	No Mitigation Measures Required	Positive, Slight, Long Term and Likely
Aviation	Negative, Moderate to Significant, Long Term and Likely	Refer to Section 15.5.2.3	Negative, Imperceptible, Long Term and Likely
Television and Telecommunications	Negative , Slight, Long Term and Likely	Refer to Section 15.5.2.4	Neutral, Imperceptible, Long Term and Likely
Gas	No Effects	No Mitigation Measures Required	No Effects
Water and Wastewater Infrastructure	Neutral, Imperceptible, Long Term and Likely	Refer to Section 15.5.2.6	Neutral, Imperceptible, Long Term and Likely
Waste Management	Negative, Slight, Long Term and Likely	Refer to Section 15.5.2.7	Negative, Imperceptible, Long Term and Likely

15.7 References

<https://cei.openeir.ie/> [Last Accessed on: 11/12/2023]

Gas Networks Ireland Dial Before You Dig Maps (DBYD);

ESB Dial Before You Dig Maps (DBYD);

Guidelines on the information to be contained in Environmental Impact Assessment Reports EIAR (EPA 2022);

Clare County Development Plan 2023-2029;

The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE PDV 02045 May 2014;

Landfill Directive (2018/850) (EU, 2018a);

The European Union Waste Framework Directive (2008/98/EC);

The European Commission's 'Circular Economy Action Plan' (EC, 2020);

The Waste Management (Collection Permit) (Amendment) (No. 2) Regulations 2023;

Waste Management (Facility Permit and Registration) Regulations 2007 – 2019 (as amended) (S.I. (S.I. No. 821/2007);

European Union (Waste Licensing) (Amendment) Regulations 2019;

Waste Management (Packaging) Regulations 2014 to 2022 (as amended);

Waste Management (Planning) Regulations 1997 (as amended) (S.I. No. 137/1997);

Waste Management (Landfill Levy) (Amendment) Regulations 2023;

Waste Management (Food Waste) Regulations 2009 – 2015 (as amended);

Waste Management (Hazardous Waste) Regulations 1998 to 2000;

Waste Management (Shipments of Waste) Regulations 2007 (as amended) (S.I. No. 419/2007);

Waste Management Act 1996 (as amended) (Act No. 10/1996);

Environmental Protection Agency Acts 1992 – 2011 (as amended);

Protection of the Environment Act 2003 (as amended) (Act No 27/2003);

Litter Pollution Acts 1997 to 2009 (as amended);

Planning and Development Act 2000 - 2023 (as amended) (Act No. 30/2000);

Landfill Directive (2018/850) (EU, 2018a);

Circular Economy And Miscellaneous Provisions Act 2022;

Clare County Development Plan 2023-2029;

The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TAA) Guidelines PE PDV 02045 May 2014.