



Chapter 17 Material Assets – Built Services

Ballinlee Wind Farm

Ballinlee Green Energy Ltd.

September 2025

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Appendices

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17. Material Assets

17.1 Introduction

This chapter considers the potential effects on material assets arising from the proposed development.

The Environmental Protection Agency's (EPA) 'Guidelines on the Information to be contained in an Environmental Impact Assessment Report' (EPA, 2022) describes material assets to be taken to mean 'built services' (i.e. built services networks including electricity, telecommunications, gas, water supply infrastructure and sewerage), and 'waste management'. These are all considered within this chapter. Roads and traffic infrastructure is addressed in **Volume II, Chapter 16** Material Assets – Traffic and Transport of this EIAR.

The nature and probability of effects on material assets arising from the proposed development has been assessed. The assessment comprises:

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

17.1.1 Project Summary

A full description of the proposed development is provided in **Volume II, Chapter 02** Description of the Proposed Development of this EIAR.

Ballinlee Green Energy Ltd (the Applicant) propose to develop a wind farm (named Ballinlee Wind Farm) comprising of seventeen (17) No. wind turbines located on privately-owned predominantly agricultural lands in east County Limerick.

Table 17-1 sets out the characteristics of the project elements for which development consent is being sought and all other associated project components.

Table 17-1: Characteristics of the Proposed Development

Proposed Development for which consent is sought	Core Wind Farm Components - Seventeen (17) No. wind turbines (turbine tip height of 160m, and 150m (T6 only)) with associated foundations and crane hardstand areas. - One (1) No. Permanent Meteorological Mast (92m height) and associated foundation, hardstand area and ancillary main crane hardstand area. - One (1) No. Electrical Substation (110kV) including Eirgrid compound, IPP, maintenance compounds, ancillary building, security fencing and all associated works. - Nine (9) No. site entrances. - New and upgraded internal site service tracks (approximately 10.8km of new internal access tracks to be constructed). - New clear span bridge over the Morningstar River. - Underground electric collector cable systems between turbines within the wind farm site. - Underground electric cabling systems between the wind farm site and connection point at existing Killonan 220/110kV substation. Associated Components of the Proposed Development - New temporary access track via R516 to facilitate turbine delivery route located in the townland of Tullovin. - Three (3) No. temporary construction site compounds (one approximately 95m x 50m and two approximately 55m x 25m). - Two (2) No. borrow pits to be used as a source of stone material during construction and for storage of excess excavated materials. - Nine (9) No. permanent and two (2) temporary deposition areas. - Associated surface water management systems. - Tree felling required for wind farm infrastructure.
Other Associated Project Components	- Whooper Swan Management Area works. - Habitat Enhancement areas works. - Landscaping, fencing and all associated works.

17.1.2 Competency of Assessor

The assessment was completed by Kieran Barry BEng (Civil/Structural Engineering), PgDip (Environmental Protection), an Environmental Consultant with Malachy Walsh and Partners (MWP), and Consultants from *Ai Bridges*. Kieran is a Chartered Environmentalist (CEnv) having worked for 9 years in the environmental sector. Kieran works on a variety of infrastructure projects, including wind farms, conducting environmental assessments, 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 EIAs. *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 Aileen O'Connor (MWP), BSc(Hons), PGDip, who has over 13 years' experience in the environmental field both in industry and consultancy work. Aileen is a Senior Environmental Consultant and holds a BSc(Hons) in Environmental Science and PGDip in Energy Management. Aileen is an experienced and competent environmental professional with a background in contaminated land assessment, licence compliance and waste management. Aileen has prepared and peer reviewed chapters of EIARs and has coordinated and delivered many environmental assessment reports and consent applications for transmission and power generation projects including the preparation of Resource Waste Management Plans RWMPs and contributed to Material Assets Impact Assessments. More specifically, she has worked on a wide variety of projects during her career to date including wind farms, marine, quarries, industrial and commercial developments.

17.2 Methodology

The methodology of the assessment comprises the following and accords with best practice and guidance:

- Identifying baseline conditions and the likely evolution of the baseline of the site and its environs.
- Identifying the sensitivity of receptors that have potential to be affected by changes in the baseline conditions.
- Assessing the significance of effect considering sensitivity of receptors and magnitude of effect.
- Predicting the magnitude of likely changes to the baseline receiving environment.
- 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 3rd March 2025, with a search 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 Limerick Development Plan 2022-2028 in order to identify future development and planning applications within the area of the proposed development and surrounding locations.
- Review of Limerick City and 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 (DBYD) Maps;

- Uisce Éireann Maps;
- Commission for Communications Regulation Telecommunications coverage maps;
- EPA Waste Collection Register, Waste Facility Permit Register, Waste Licences.

17.2.1 Legislation, Policy and Guidance

The legislation, policy and guidance applicable to the assessment are as follows:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA), May 2022);
- Guidelines on the preparation of the EIAR (European Commission 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018);
- A Waste Action Plan for a Circular Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025 (Government of Ireland);
- Landfill Directive (EU) 2024/1785 (EU, 2024a);
- The European Union Waste Framework Directive Council Directive 98/2008/EC as amended by Directive 2018/851 (EU, 2018b);
- The European Commission's 'Circular Economy Action Plan' (EC, 2020);
- European Directive 2011/92/EU as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive);
- Planning and Development Regulations 2001 (as amended);
- Revised National Planning Framework (NPF, 2025);
- Limerick Development Plan 2022-2028 (as relevant to infrastructure and utilities);
- Electricity Regulation Act 1999 (as amended);
- The European Communities (Internal Market in Electricity) Regulations 2000 (as amended);
- Climate Action and Low Carbon Development (Amendment) Act 2021;
- EirGrid's Transmission Development Plan (TDP) 2024-2033;
- Gas Act 1976 (as amended);
- Gas (Interim) (Regulation) Act 2002;
- Safety in Gas Works Regulations (S.I. NO. 299/2007);
- Communications Regulation Act 2002 (as amended);
- European Electronic Communications Code Directive (EU) 2018/1972;
- ComReg Guidance and licensing requirements;
- European Union (Drinking Water) Regulations 2023 (S.I. No. 99/2023, as amended);

- European Union (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001, as amended);
- Water Services Acts 2007–2017;
- Waste Management Acts 1996–2011 (as amended);
- Circular Economy and Miscellaneous Provisions Act 2022;
- European (Waste Framework Directive) Regulations 2011 (S.I. No. 126 of 2011);
- National Waste Management Plan for a Circular Economy (2022);
- Hazardous Waste Management Plan for Ireland (2021–2027);
- Planning and Development Act 2000 - (as amended) (Act No. 30/2000);
- Irish Aviation Authority Act 1993 (as amended);
- Irish Aviation Authority (Obstacles to Aircraft in Flight) Order 2005 (S.I. No. 215/2005);
- ICAO Annex 14 Aerodromes, Volume I; and
- Wind Energy Association (IWEA) Guidelines on Wind Energy and Aviation (2012).

17.2.2 Study Area

In accordance with the EPA (2022) *Guidelines on the Information to be Contained in EIARs*, the study area for Material Assets has been defined to encompass the infrastructure, utilities, and land uses that may be directly or indirectly affected by the proposed development, refer to **Figure 17-1** for site location. Material Assets include physical resources such as forestry, agricultural land, roads, water and wastewater infrastructure, energy and communications networks, and waste management facilities. The following spatial extents have been applied to this assessment:

- **Wind Farm Site Boundary**

The primary study area includes all lands within the proposed wind farm boundary, comprising turbine locations, internal access tracks, the on-site substation, and the meteorological mast. This captures the footprint of the development where direct interaction with material assets such as forestry, agricultural lands, and underground/overhead utilities may occur.

- **Grid Connection Corridor**

The grid connection route from the on-site substation to the existing Killonan 220/110 kV substation has been included within the study area. A buffer of approximately 100 m either side of the proposed grid route has been adopted in the baseline desktop review to account for potential interaction with existing material assets such as electricity, gas, telecommunications, and water infrastructure.

- **Wider Zone of Influence (Zoi)**

A wider Zoi of up to 15 km from the wind farm boundary has been considered where relevant, particularly for aviation, telecommunications, and waste management facilities. This reflects the potential for indirect effects on regional-scale infrastructure such as airports, aerodromes, radio links, and waste collection/treatment facilities.

- **Local Settlements and Community Infrastructure**

Settlements in proximity to the proposed development, including Bruff, Athlacca, Bruree, and surrounding rural areas, form part of the study area to ensure that community-based material assets are captured. This includes public water supplies, wastewater treatment facilities, and local road networks that may be utilised during construction, operation and decommissioning.

The defined study area therefore ensures that all relevant categories of Material Assets, as set out in the EIA Directive and EPA guidance, are adequately addressed in this chapter.

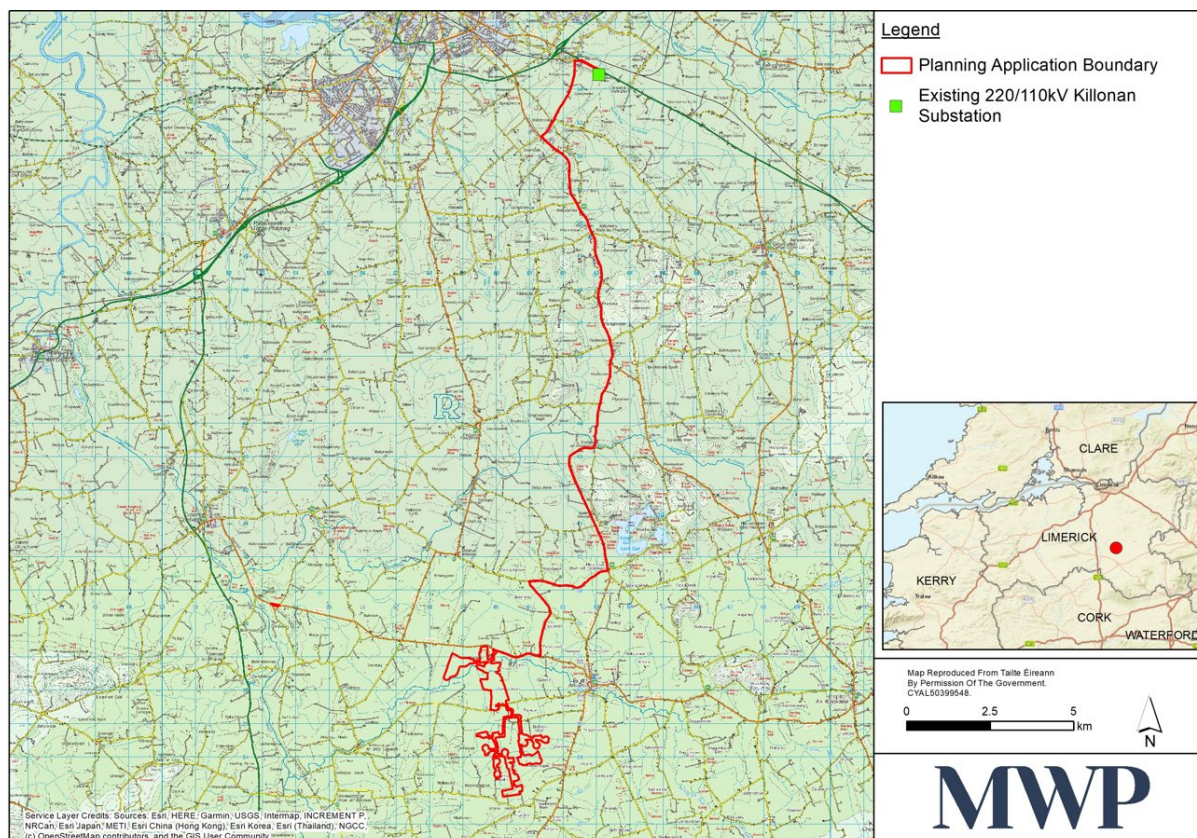


Figure 17-1: Site Location

17.2.3 Scope of Assessment

Ballinlee Green Energy Ltd (the Applicant) propose to develop a wind farm (Ballinlee Wind Farm) comprising of seventeen (17) No. wind turbines located on privately-owned predominantly agricultural lands in east County Limerick.

For the purpose of this planning application and EIAR, the proposed development is referred to as “Ballinlee Wind Farm”.

The main components of the project are seventeen (17) wind turbines, an on-site 110kV electrical substation, a permanent meteorological mast, borrow pits, deposition areas and an underground electrical connection to the existing 220/110kV Killonan substation.

Temporary accommodation works along the public road to allow for the delivery of wind turbine components from the Port of Foynes are discussed in **Volume II, Chapter 02** Description of the Proposed Development, **Section 2.5.3** of this EIAR.

Should the wind farm become operational, this wind farm will be capable of providing in excess of 76 megawatts (MW) of renewable electricity to the National Grid.

This assessment considers the effects of the construction, operation, and decommissioning of the proposed development in terms of how it could affect the material assets relevant to the proposed development.

The material assets relevant to the proposed development were determined in accordance with the following:

- EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports (2022)

The 2022 EPA Guidelines describes 'Material Assets' to be taken to mean 'built services and infrastructure', it includes traffic as traffic makes use of transport infrastructure. The Traffic aspect of the proposed development is assessed as part of this EIAR (**Volume II, Chapter 16** Material Assets-Traffic and Transportation). **Table 17-2** outlines topic areas to be examined when considering the impact of a development on Material Assets, as recommended in the 2022 Guidelines.

Table 17-2: Material Assets and Topics to be included

Material Asset	Topics to be Covered
Built Services	Electricity Aviation Telecommunications Gas Water Supply Infrastructure Sewerage
Waste Management	Construction Phase Operational Phase Decommissioning Phase

Based on a review of the proposed development and the suggested topic areas set out in the 2022 EPA Guidelines, the following topics are included in this Material Assets impact assessment chapter:

- Grid Capacity and Electrical Infrastructure;
- Gas;
- Telecommunications and Aviation;
- Water and Wastewater infrastructure; and
- Waste Management.

Other topic areas which are closely related are considered in other sections of this EIAR and therefore reference should be made to the associated chapters as follows:

- The assessment on the land and geological resource is presented in **Volume II, Chapter 08** Lands and Soil in this EIAR. No further assessment on this topic is included in this chapter.
- Water resources are considered in the assessment on the surface water and groundwater resource provided in **Volume II, Chapter 09** Water of this EIAR. No further assessment on this topic is included in this chapter.
- The assessment on Cultural Assets is provided in **Volume II, Chapter 14** Cultural Heritage of this EIAR. No further assessment on this topic is included in this chapter.
- Assimilative capacity of the air resource is considered in the assessment provided in **Volume II, Chapter 10** Air Quality of this EIAR.

- The subject of Roads and Traffic is provided in **Volume II, Chapter 16** Material Assets – Traffic and Transportation of this EIAR.

17.2.3.1 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 (EPA, 2022). Accordingly, the scope of this assessment is made with respect to these topic areas and considers the effects of the construction, operation and decommissioning of the proposed development in terms of how the proposal could affect each.

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.

17.2.4 Statement on Limitations and Difficulties Encountered

No difficulties were encountered during the writing of this chapter.

17.3 Baseline Environment

As part of the baseline environment desktop study, information from various service providers was reviewed. Given the geographical extent of the proposed wind farm and associated infrastructure, the presence of existing services within the area is expected. A summary of the existing services in proximity to proposed development is summarised as follows:

17.3.1 Forestry and Hedgerow

Forests are an important renewable resource with a role to play in sustainable rural economic development. The Country's forestry resources are also recognised as having a role 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.

Hedgerows are an important natural resource, providing vital habitats and corridors for wildlife while supporting biodiversity and pollinators. They protect soil from erosion, improve water management, and store carbon, helping tackle climate change. For agriculture, they act as windbreaks, support natural pest control, and create beneficial microclimates. Beyond their ecological and farming value, hedgerows also hold cultural and historical significance, shaping rural landscapes and heritage.

Volume II, Chapter 06 Biodiversity of this EIAR details the forestry cover and hedgerow which currently exists within the biodiversity study area. There is approximately 12.8 km of treelines within the proposed development biodiversity study area as well as approximately 35.4 km of hedgerow. The surrounding land includes pastures and areas principally used for agriculture.

17.3.2 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) 2024 is the plan for the development of the Irish transmission network and interconnection over the ten years from 2024 to 2033. 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 TDP outlined several planned reinforcement projects for the Transmission Network in Limerick City and County, including the redevelopment of the existing 220/110kV Killoan substation. These works included replacement of the Air Insulated Station (AIS) station with a Gas Insulated Station (GIS) station on an adjacent site.

Within the grounds of the existing 220/110 kV Killoan substation, there are multiple HV and MV cables. This is similar for the rest of the Grid Connection Route. Along this route, there are existing underground cables, which are the lower voltage MV or LV cables. Furthermore, there are multiple overhead lines encountered along the route ranging from LV to HV.

Review of maps provided by ESB networks confirm that there are also some existing MV overhead lines in proximity to turbines, mainly turbines which are located in the southern section of the proposed wind farm development. These overhead lines may need to be diverted or undergrounded if required by the distribution network operator (ESB Networks). Any diversion or undergrounding works undertaken will be completed following agreement with ESB Networks and in accordance with their specifications and requirements and in line with the cabling to be installed as part of the proposed development.

17.3.3 Gas

A desktop study identified that a high-pressure Gas Networks Ireland (GNI) pipeline crosses both the northern and southern sections of the wind farm site boundary (refer to **Figures 17-2, 17-3, and 17-4**). The Applicant consulted with GNI in relation to the gas pipeline which crosses the wind farm site boundary.

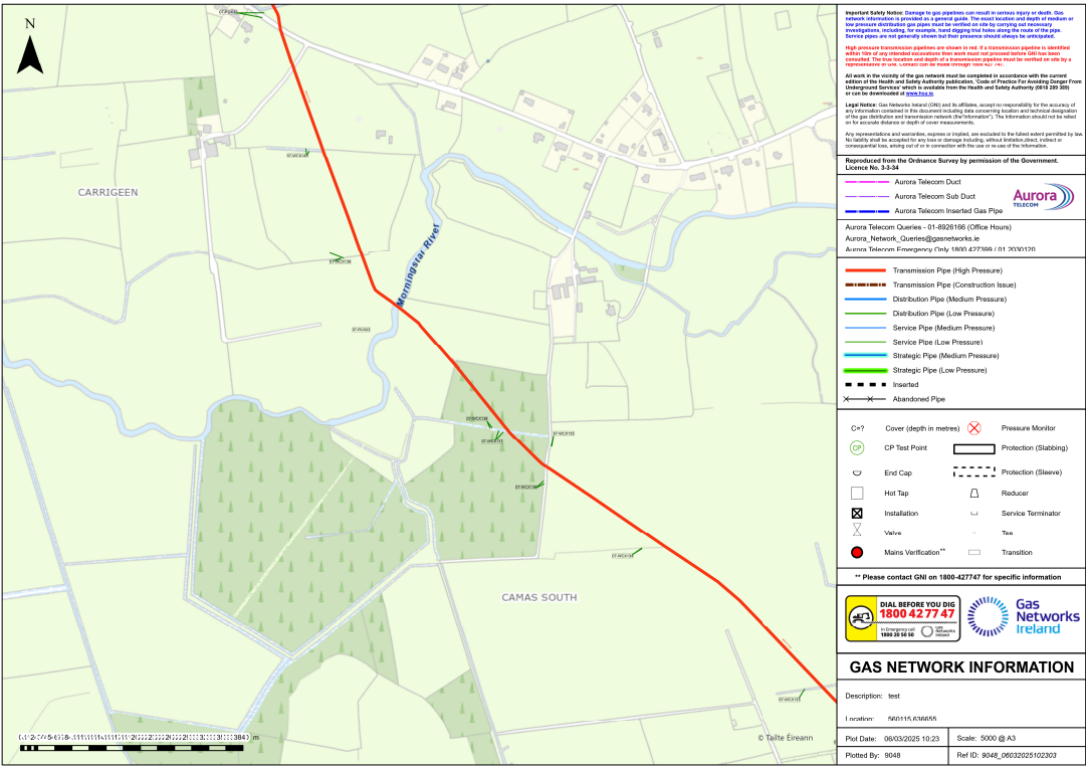


Figure 17-2: Gas Network Ireland Maps (Northern Section of the Wind Farm Site)

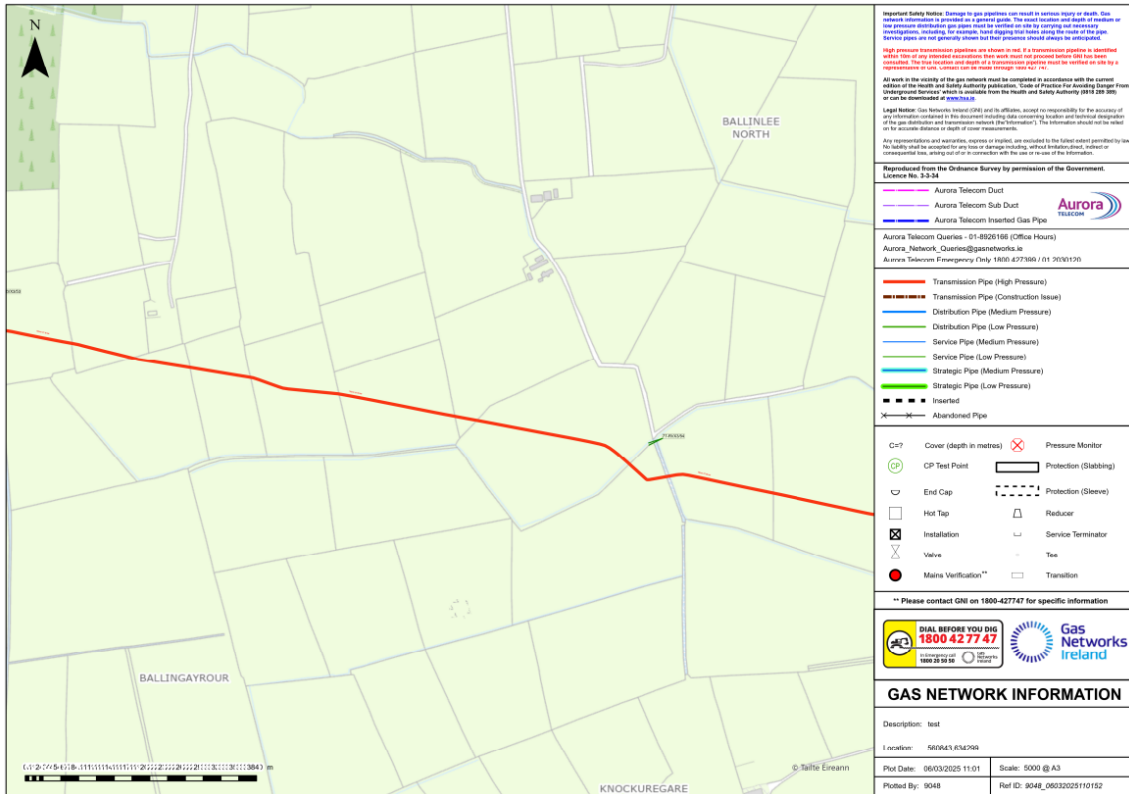


Figure 17-3: Gas Network Ireland Maps (Northern Section of Wind Farm Boundary)

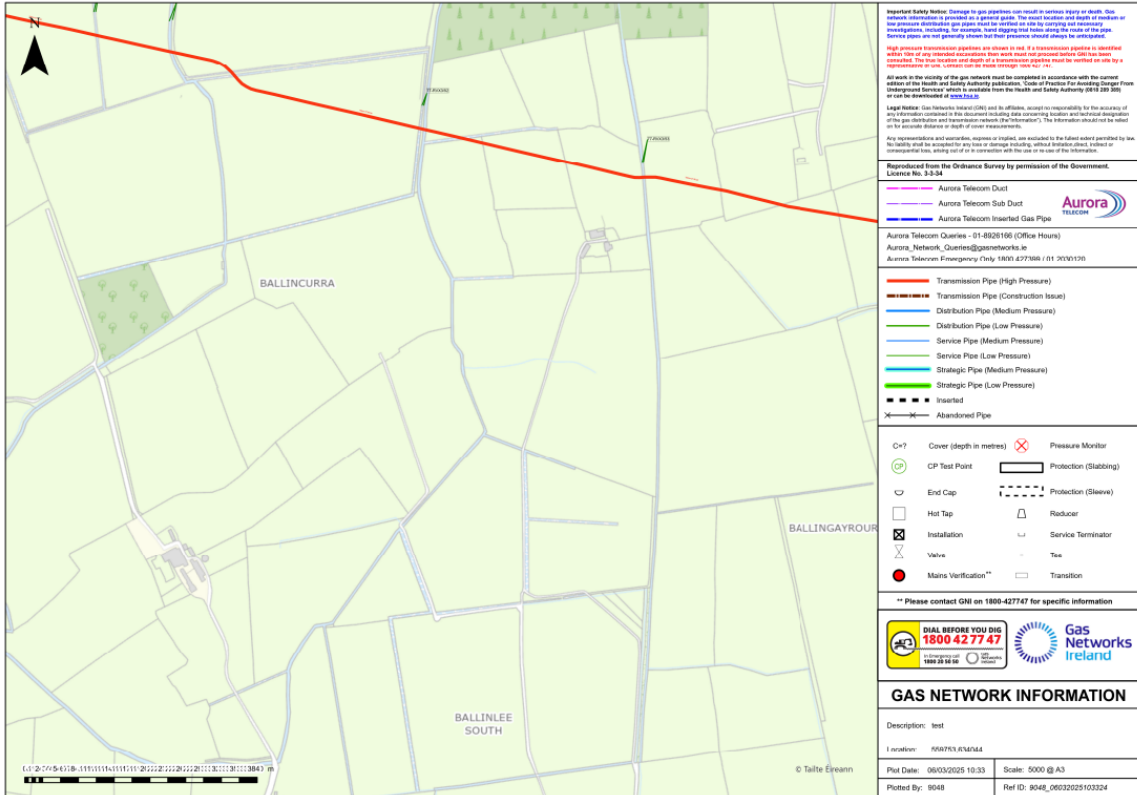


Figure 17-4: Gas Network Ireland Maps (Southern Section of Wind Farm Boundary)

At the northern section of the grid connection route, there is also a medium pressure distribution pipeline, refer to **Figure 17-5** to **Figure 17-8**. The gas pipeline starts at Ballyneety, refer to **Figure 17-5**, and continues to Limerick City. When the grid connection route turns off on the L1170, refer to **Figure 17-8**, there are no further mapped gas pipelines.

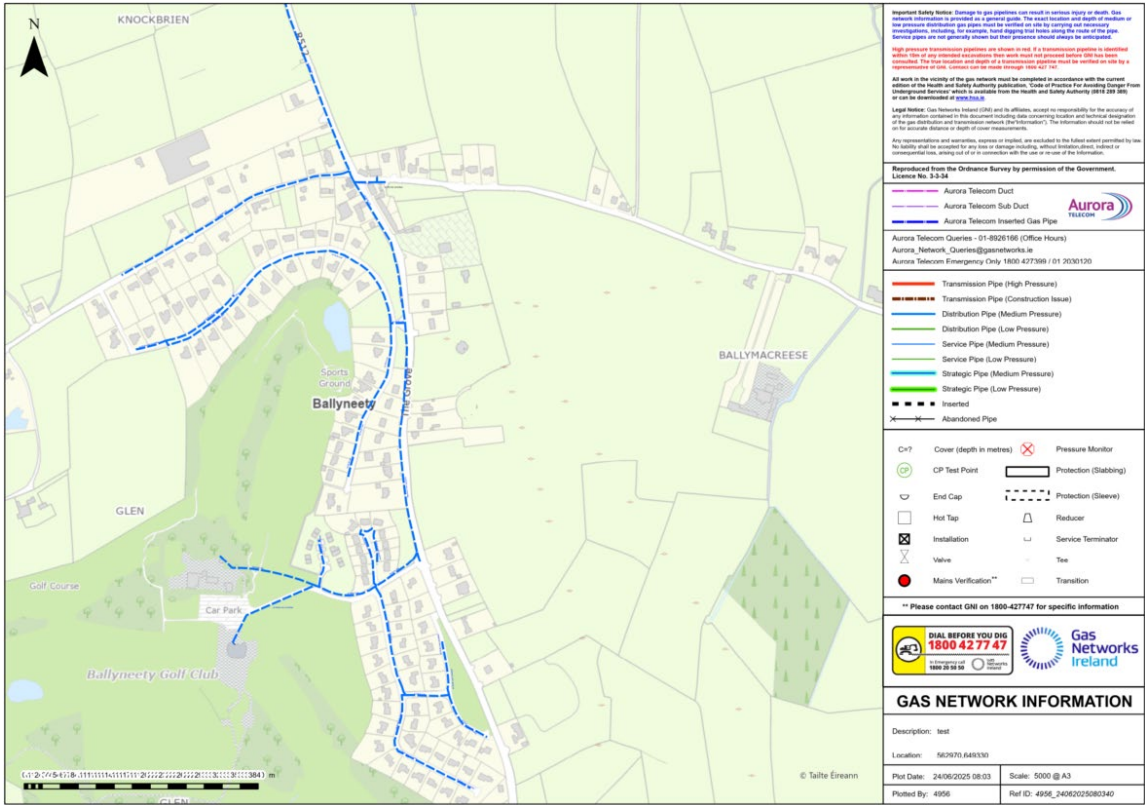


Figure 17-5: Gas Networks Ireland Maps (Northern section of grid connection – Ballyneety)

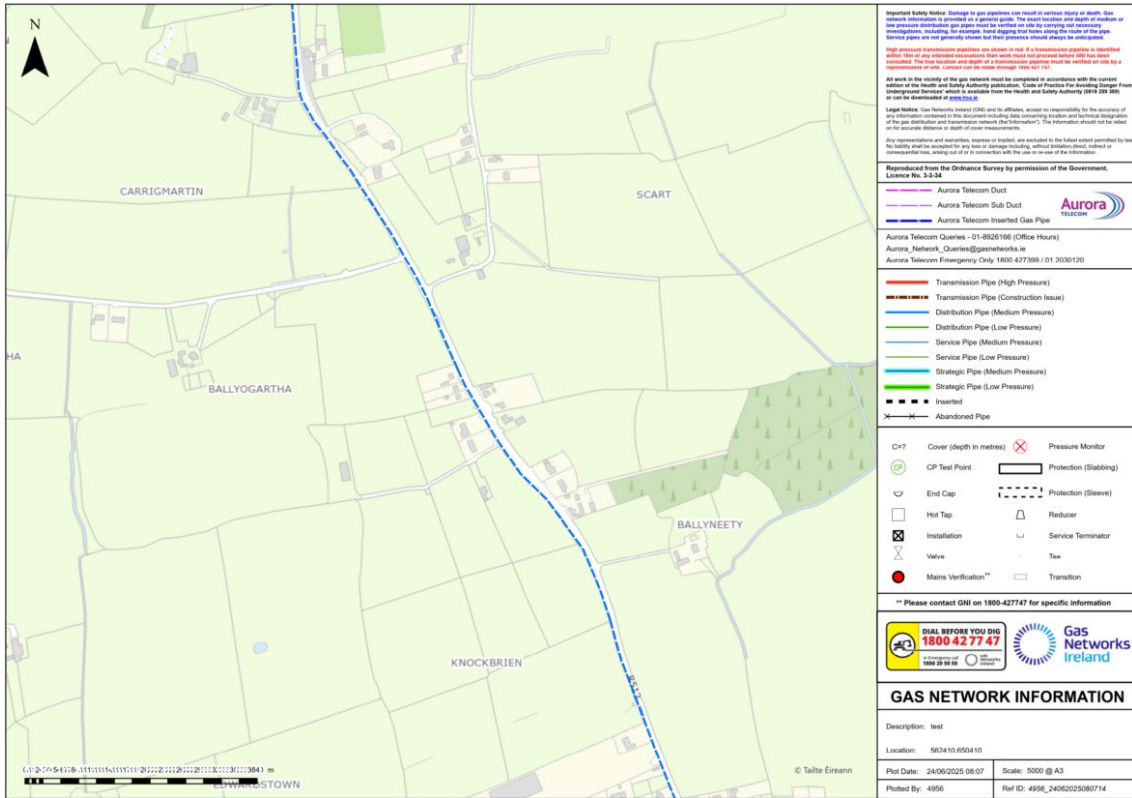


Figure 17-6: Gas Networks Ireland Maps (Northern section of grid connection – Ballyneety contd.)

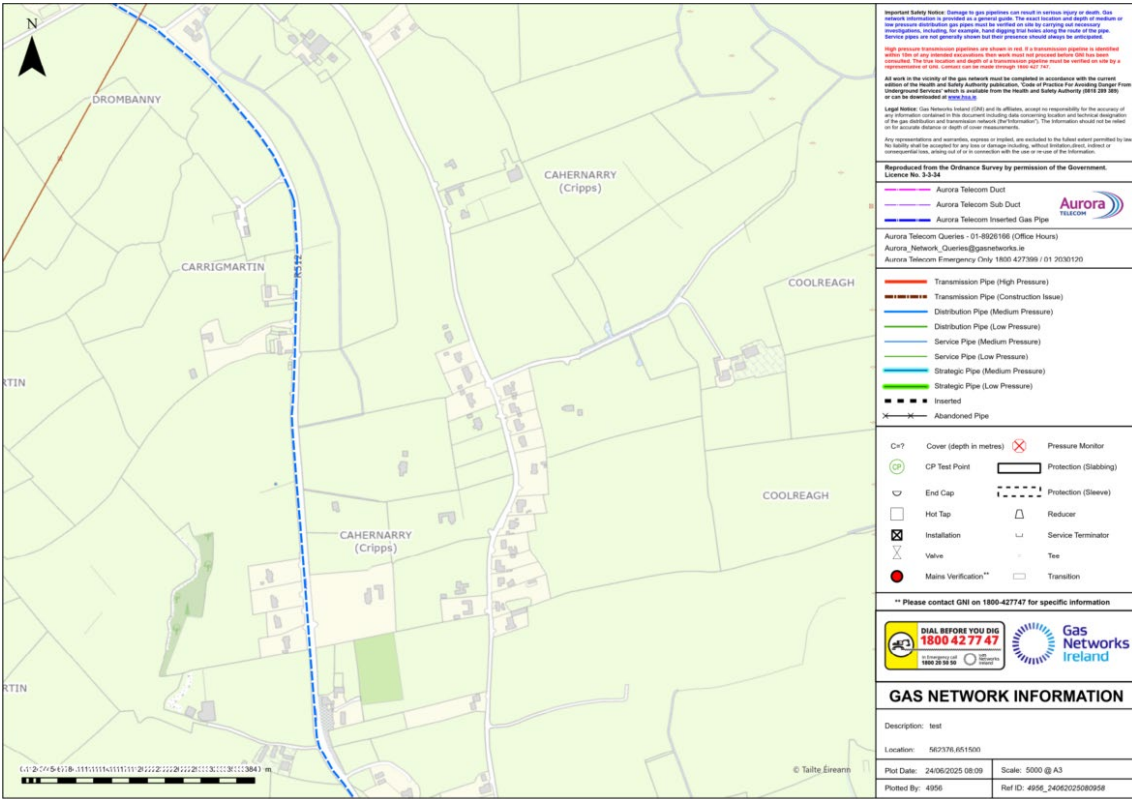


Figure 17-7: Gas Networks Ireland Maps (Northern section of grid connection - towards Limerick)

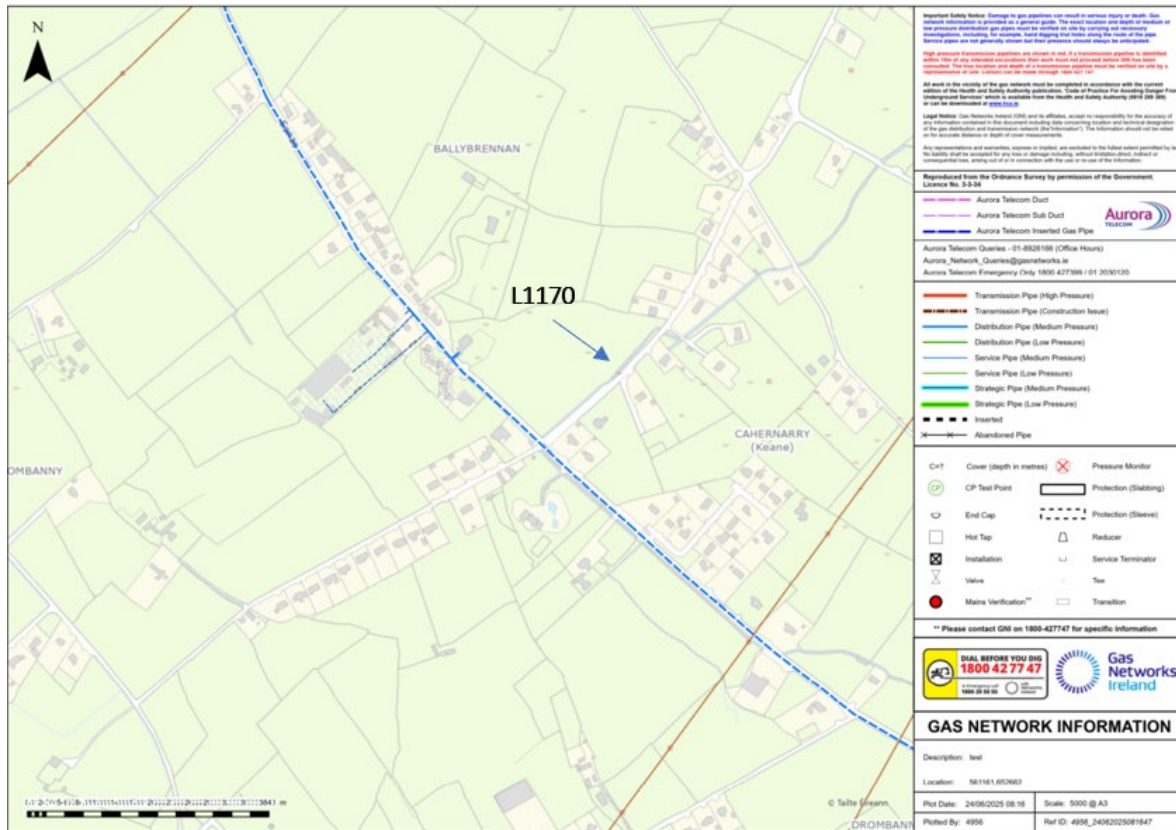


Figure 17-8: Gas Networks Ireland Maps (Northern section of grid connection – towards Limerick)

17.3.4 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.

MWP commissioned Ai Bridges Ltd to review the possible impacts on aviation systems in the vicinity of the proposed wind farm, refer to Ballinlee Wind Farm Aviation Review Statement **Volume III, Appendix 17A** of this EIAR.

Elevated structures within the proposed development will include seventeen (17) wind turbines and a meteorological mast. It is proposed that sixteen (16) of the turbines will have a tip height of 160m and one (1) will have a tip height of 150m, the met mast will be approximately 92m in height.

Shannon Airport, is one of Ireland's main international Airports and is an important state economic asset, and is located circa 30km north 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 17-9).

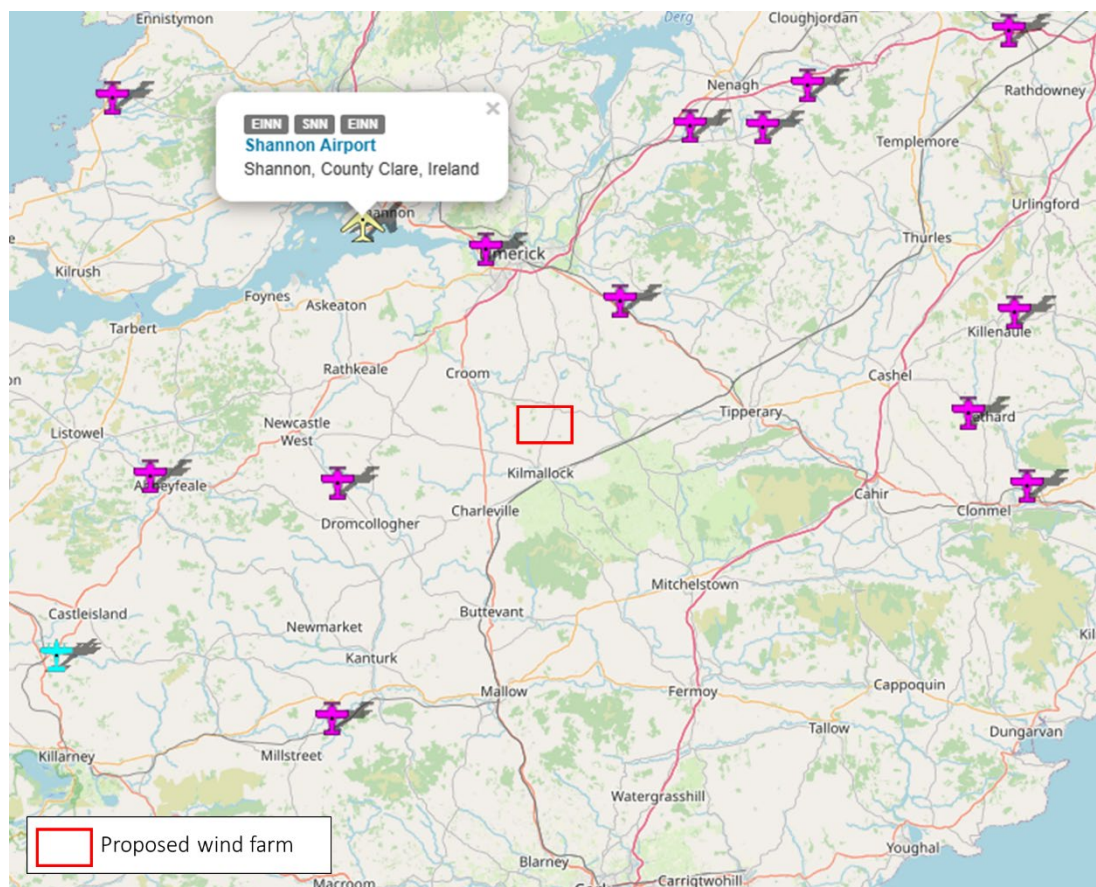


Figure 17-9: Aviation facilities in proximity to the development site

17.3.5 Telecommunications

Ai Bridges were commissioned to evaluate the possible impacts that the proposed wind farm could have on existing telecommunications operator networks. The scope of work included field and desktop surveys to determine telecommunications network infrastructure that could be impacted by the proposed development. Consultations with telecom operators were also undertaken to assist in identifying network infrastructure that could be impacted. During the consultation 19 telecom operators were contacted. At the time of writing this chapter, 14 of the 19 telecom operators contacted have responded to the consultation request. The responses received can be found in **Section 3** of the Ai Bridges Ballinlee Telecommunications Impact Assessment, which is included in this EIAR **Volume III, Appendix 17B**.

Results from the impact analysis indicate that there are 4 radio links that cross over/near the proposed development (see **Table 17-3**). The radio links which could possibly be impacted by the wind farm development are illustrated in **Figure 17-10**.

Table 17-3: Microwave radio links potentially impacted by proposed wind farm.

Telecom Operator	Link Description	Nearest Turbine	Fresnel Zone (F1) Clearance	Wind Farm Impacts/Observations
Eir	Limerick to Ballyhoura	T04	33.9 m	No impacts.
Eir	Slieveveagh to Tooreen	T17	2.4 m	The clearance distance from T17 to the Fresnel Zone of this radio link is minimal and Eir may request that mitigation measures are put in place. Mitigation measures are described in Section 17.5 of this Chapter and Section 6 of Ballinlee Telecommunications Impact Assessment (EIAR Volume III, Appendix 17B).
Vodafone	Tullovlin to Bruff (18 GHz)	T01	>400m	No Impacts
Vodafone	Tullovlin to Bruff (15GHz)	T01	>400m	No Impacts

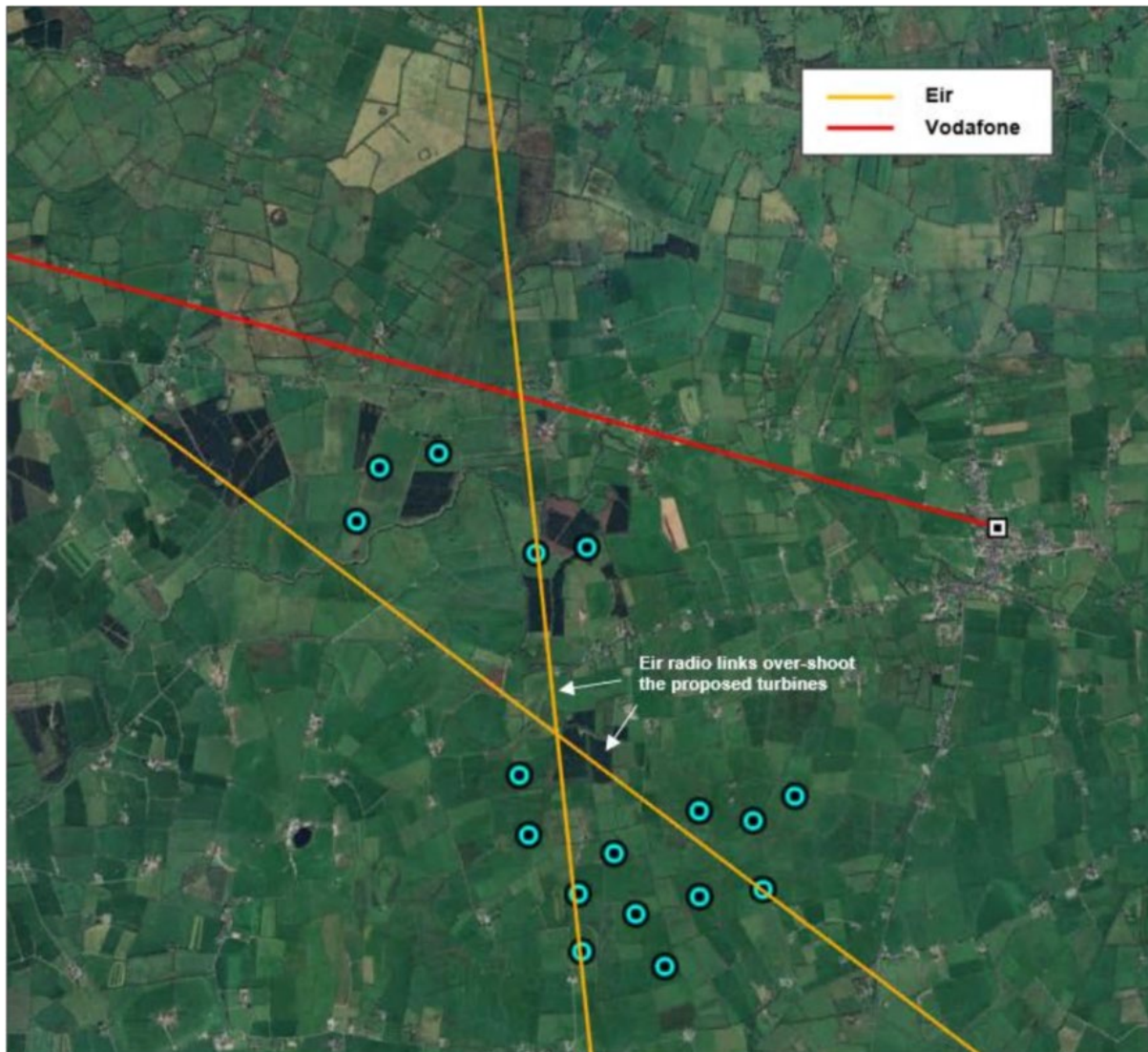


Figure 17-10: Plan view of Radio links that cross through/near the proposed wind farm development

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 located in Athlacca, Bruff, Dromin and Kilmallock primarily receive TV reception from the southwest via the transmitter at Mullaghanish, County Cork.
- Areas located in Bruree primarily receive TV reception from the north via the transmitter at Maghera, County Clare.

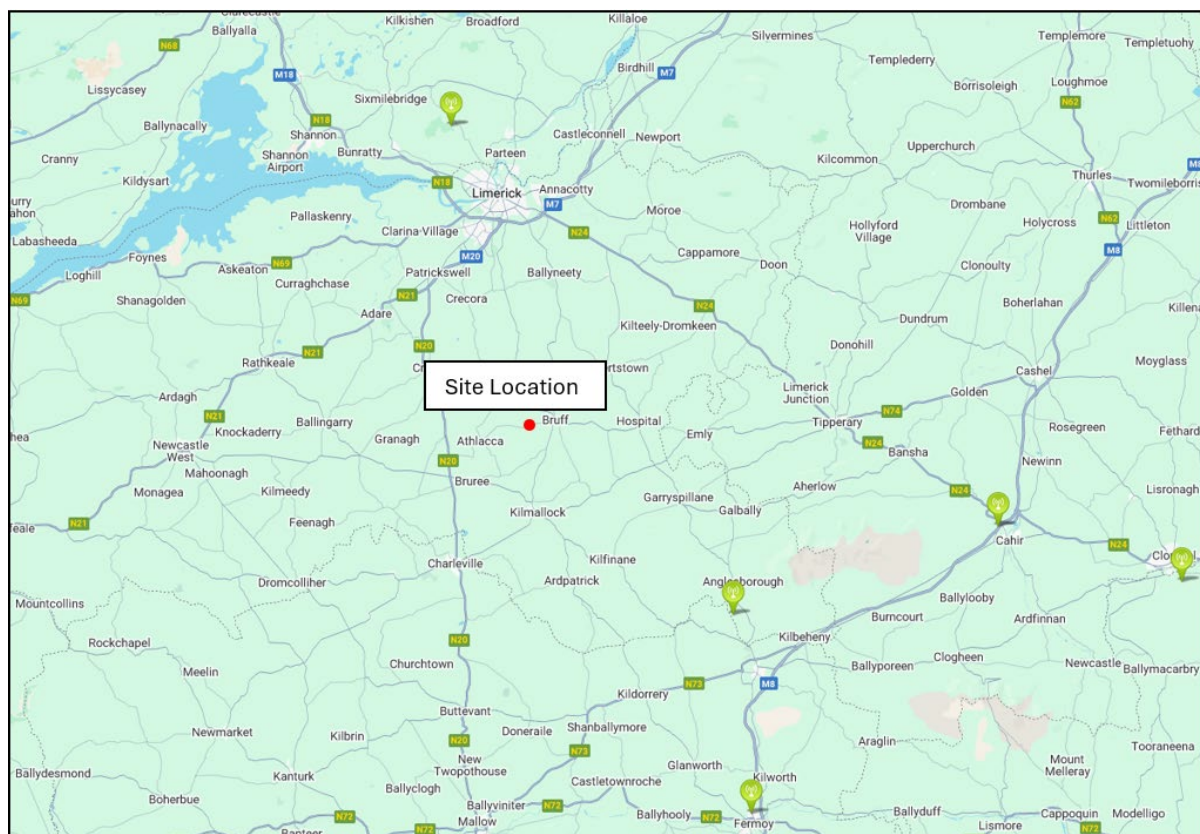


Figure 17-11: TV transmitters in proximity to the proposed wind farm site.
(<https://www.saorview.ie/en/get/coverage>)

A review of the Commission for Communications Regulation site was undertaken to check the Mobile network operators with masts and communication links in the area. The ComReg¹ site map in **Figure 17-12** shows mobile communication masts (highlighted in green circle) in the surrounding areas of the study area. These include Vodafone, Three, Eircom and Imagine Communications Ireland.

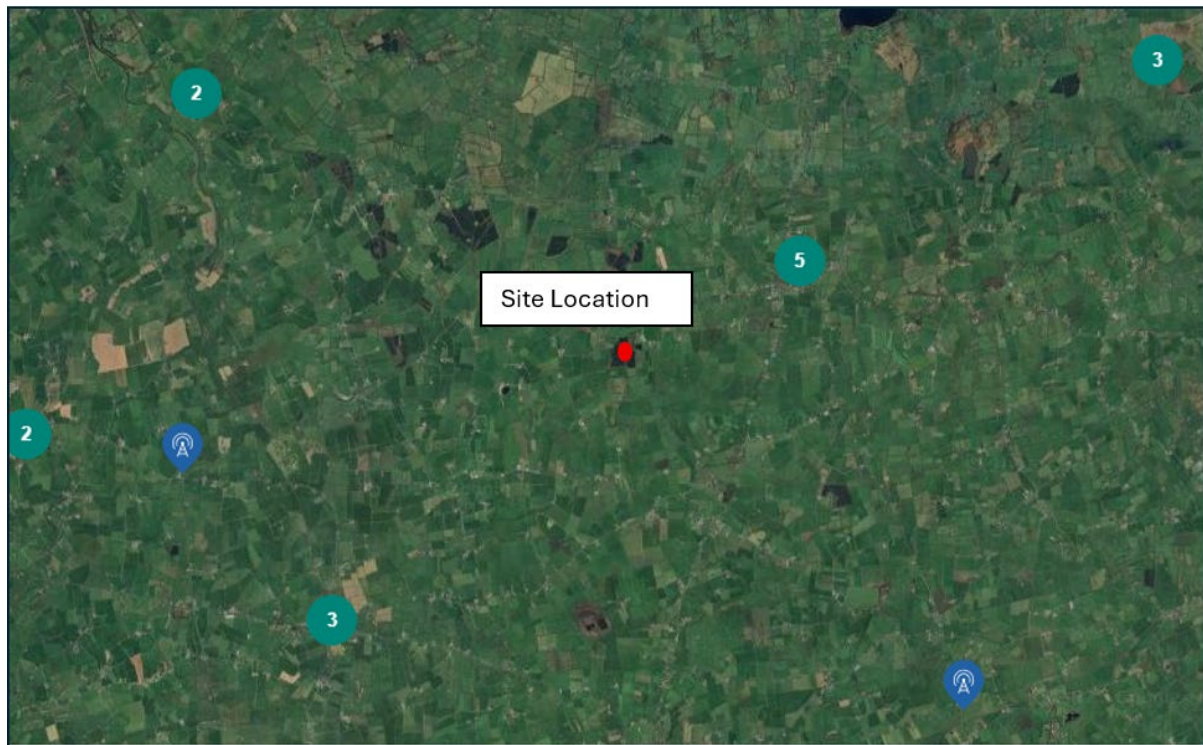


Figure 17-12 Mobile Communication Masts

17.3.6 Water and Wastewater Infrastructure

The following details were sourced from Uisce Éireann Maps, which were reviewed in order to confirm existing water and wastewater infrastructure within the proposed development study area.

Existing Water Infrastructure

There is an existing watermain located along the R516 to the north of the proposed development as well as a watermain which runs along the L1414 which is located between the north and south sections of the proposed development, refer to **Figure 17-13**.

There are also watermain underground along the grid route including the R512 road where most of the grid connection is located.

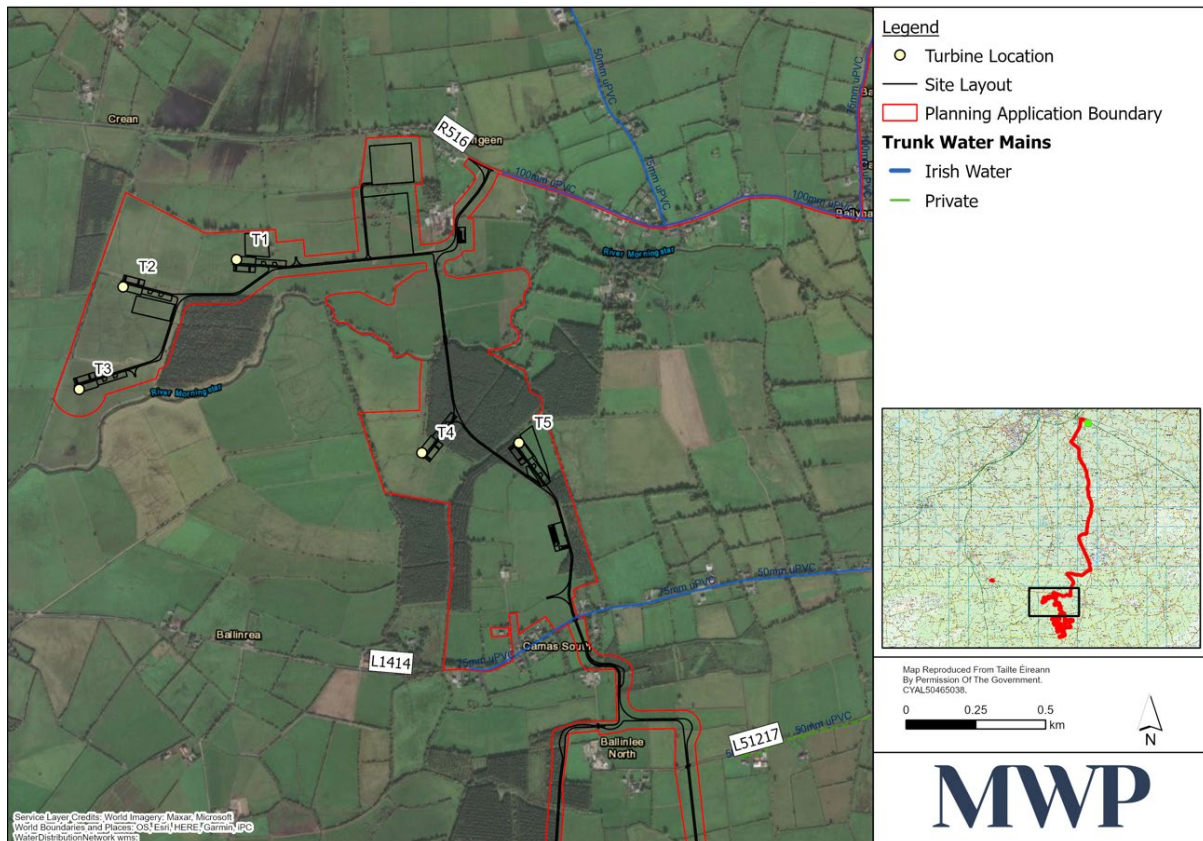


Figure 17-13: Existing Water Infrastructure

Existing Wastewater Infrastructure

There is no wastewater infrastructure within the proposed windfarm development but there is a private wastewater infrastructure along the public road which the grid connection crosses.

The nearest Wastewater Treatment Plant (WWTP) is located in Bruff approximately 3km north-east of the proposed development and there is a network of wastewater pipes within the town which collects foul and directs it to the WWTP. Along the grid connection route, dwellings are served by individual septic tanks for wastewater treatment.

Consultation with Uisce Éireann

Uisce Éireann (8th October 2024) confirmed the presence of water mains at Camas South and Ballinrea, as indicated on **Figure 17-13**, advising that any cabling works may require a diversion. They requested that the EIAR address potential impacts on public water supply abstraction points (notably Athlacca South), water services capacity, and protection of water quality during construction and operation. They also confirmed that no new surface water discharges to combined sewers will be permitted.

17.3.7 Waste Management

There are several waste collection, treatment, recovery and disposal facilities within Limerick to efficiently manage waste in the surrounding area. Authorised waste facilities in Limerick are listed in **Table 17-4**.

Table 17-4: Licensed Waste Facilities in proximity to the Proposed Development

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
15 01 01	Paper and cardboard packaging	Alfa Skips Limited (NWCPO-09-05608-02)	Reboge, Limerick, V94 Y982	WM Fitzgerald SkipHire Limited. (WFP/L/2021/11/002/01/R3)	Timaru Rathbane North Limerick Co. Limerick V94 A039
		Ward Waste Products Ltd (NWCPO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	KDI Recycling Ltd. (WFP/L/2024/217/R4)	Unit 9 Dromkeen Industrial Estate Drombane Dromkeen V94 X9X2
		DGD Papers Ltd. (NWCPO-11-05669-03)	Bay M1 Ballycummin Avenue Raheen Business Park Limerick V94 ED34	DGD Papers Ltd. (WFP/L/2024/09C/R7)	Bay M1 Ballycummin Avenue Raheen Business Park Limerick V94 ED34
15 01 02	Plastic Packaging	Alfa Skips Limited (NWCPO-09-05608-02)	Reboge, Limerick, V94 Y982	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro Co. Limerick V94TP68
		DGD Papers Ltd. (NWCPO-11-05669-03)	Bay M1 Ballycummin Avenue Raheen Business Park Limerick V94 ED34	DGD Papers Ltd. (WFP/L/2024/09C/R7)	Bay M1 Ballycummin Avenue Raheen Business Park Limerick V94 ED34
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths,	Derry White Skip Hire Limited (NWCPO-	Mountplummer Broadford Co Limerick P56 N224	KDI Recycling Ltd. (WFP/L/2024/217/R4)	Unit 9 Dromkeen Industrial Estate Drombane

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
	protective clothing contaminated by hazardous substances	14-11356-07)			Dromkeen V94 X9X2
17 01 01	Concrete	Taylor Rubbish Removals (NWCPO-09-05617-03)	20 Claughan Court Garryowen Limerick V94 HOVH	Coolrus Plant Hire Ltd. (WFP/L/2022/189/R2)	Cappanahane Kilmallock Co. Limerick
		United Metal Recycling (Ireland) Ltd. (NWCPO-10-05657-03)	Eastway Business Park Ballysimon Co. Limerick	WM Fitzgerald SkipHire Limited. (WFP/L/2021/11/002/01/R)	Timaru Rathbane North Limerick Co. Limerick V94 A039
		Smith Demolition Ltd (NWPCO-11-05668-03)	Killougheen Newcastle West Co. Limerick	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro Co. Limerick V94TP68
17 01 07	mixture of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	Smith Demolition Ltd (NWPCO-11-05668-03)	Killougheen Newcastle West Co. Limerick	Coolrus Plant Hire Ltd. (WFP/L/2022/189/R2)	Cappanahane Kilmallock Co. Limerick
		Rowen Haulage Limerick Ltd (NWCPO-11-05567-04)	Atlas Avenue Dock Road Co. Limerick	WM Fitzgerald SkipHire Limited. (WFP/L/2021/11/002/01/R)	Timaru Rathbane North Limerick Co. Limerick V94 A039

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
		Limerick Grab Hire Ltd (NWPCO-21-12703-01)	Ballincarriga Kildimo Limerick	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro Co. Limerick V94TP68
17 02 01	Wood	Valcroft Unlimited Company t/a Mr. Binman (NWPCO-12-11056-08)	Dock Road Limerick Limerick V94HPV3	Woodstock Composting Ltd. (WFP-L-2023-221-R3-T1)	Lisnafulla Broadford Co. Limerick Limerick
		Alfa Skips Limited (NWPCO-09-05608-02)	Reboge, Limerick, V94 Y982	Cremins Farm Compost Ltd (WFP/L/2022/23A/R11)	Coolaleen Broadford Co Limerick
		Ward Waste Products Ltd (NWPCO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro Co. Limerick V94TP68
17 02 03	Plastic	Alfa Skips Limited (NWPCO-09-05608-02)	Reboge, Limerick, V94 Y982	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro Co. Limerick V94TP68
17 04 07	Mixed Metal	Alfa Skips Limited (NWPCO-	Reboge, Limerick, V94 Y982	Sheahan Waste Recycling Ltd.T/A Recycle Right (WFP/L/2024/170/R6)	Unit 10 B Galvone Industrial Estate Roxboro

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
		09-05608-02)			Co. Limerick V94TP68
		Limerick Metal Recycling Company Ltd (NWCPO-19-12324-01)	Ballysimon Road Limerick City Limerick	Limerick Metal Recycling Company Ltd (WFP-L-2024-11-001-01-R10-T1)	Clearcircle, Ballysimon Limerick V945C67
		Limerick Metal Recycling Company Ltd (NWCPO-19-12324-01)	Ballysimon Road Limerick City Limerick	Limerick Metal Recycling Company Ltd (WFP-L-2024-11-001-01-R10-T1)	Clearcircle, Ballysimon Limerick V945C67
17 04 11	Cables other than those mentioned in 17 04 10	Alfa Skips Limited (NWCPO-09-05608-02)	Reboge, Limerick, V94 Y982	Derry White Skip Hire Limited. (WFP/L/2023/17D/R6)	Mountplummer Broadford Co Limerick P56 N224
		United Metal Recycling (Ireland) Ltd. (NWCPO-10-05657-03)	Eastway Business Park Ballysimon Co. Limerick	United Metal Recycling (Ireland) Ltd. (WFP/L/2022/11/003/01/R2)	Monoclino Industrial Estate Ballysimon Road Limerick V94 VE42
17 05 03*	Soil and stones containing hazardous substances	Limerick Metal Recycling Company Ltd (NWCPO-19-12324-01)	Ballysimon Road Limerick City Limerick	Higgins Waste & Recycling Services Ltd (WFP-KY-24-0001-01)	Unit 16 Listowel Business Park Listowel Co. Kerry

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
17 05 04	Soil and stones	Limerick Metal Recycling Company Ltd (NWCPO-19-12324-01)	Ballysimon Road Limerick City Limerick	Valcroft Unlimited Company t/a Mr. Binman (WFP/L/2024/203/R4)	Dock Road Bunlicky Limerick
		Ward Waste Products Ltd (NWCPO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	Ward Waste Products Ltd (WFP-L-2019-11A-R4)	Knocknadiha Tournafulla Co Limerick V42 NV62
		Limerick Grab Hire Ltd (NWPCO-21-12703-01)	Ballincarriga Kildimo Limerick	WM Fitzgerald SkipHire Limited (WFP/L/2021/11/002/01/R)	Timaru Rathbane North Limerick Co. Limerick V94 A039
17 06 04	Insulation materials	Ward Waste Products Ltd (NWCPO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	Ward Waste Products Ltd (WFP-L-2019-11A-R4)	Knocknadiha Tournafulla Co Limerick V42 NV62
		Alfa Skips Limited (NWCPO-09-05608-02)	Reboge, Limerick, V94 Y982	Derry White Skip Hire Limited. (WFP/L/2023/17D/R6)	Mountplummer Broadford Co Limerick P56 N224
		Limerick Metal Recycling Company Ltd (NWCPO-	Ballysimon Road Limerick City Limerick	Limerick Metal Recycling Company Ltd (WFP-L-2024-11-001-01-R10-T1)	Clearcircle, Ballysimon Limerick V945C67

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
		19-12324-01)			
17 09 04	Mixed construction and demolition waste other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	Valcroat Unlimited Company t/a Mr. Binman (NWPCO-12-11056-08)	Dock Road Limerick Limerick V94HPV3	Valcroat Unlimited Company t/a Mr. Binman (WFP/L/2024/203/R4)	Dock Road Bunlicky Limerick
20 01 01	Paper and cardboard	Alfa Skips Limited (NWPCO-09-05608-02)	Reboge, Limerick, V94 Y982	WM Fitzgerald SkipHire Limited. (WFP/L/2021/11/002/01/R)	Timaru Rathbane North Limerick Co. Limerick V94 A039
		Ward Waste Products Ltd (NWPCO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	Ward Waste Products Ltd (WFP-L-2019-11A-R4)	Knocknadiha Tournafulla Co Limerick V42 NV62
20 03 01	Domestic waste	Valcroat Unlimited Company t/a Mr. Binman (NWPCO-12-11056-08)	Dock Road Limerick Limerick V94HPV3	Valcroat Unlimited Company t/a Mr. Binman (WFP/L/2024/203/R4)	Dock Road Bunlicky Limerick
		Derry White Skip Hire Limited (NWPCO-14-11356-07)	Mountplummer Broadford Co Limerick P56 N224	Derry White Skip Hire Limited. (WFP/L/2023/17D/R6)	Mountplummer Broadford Co Limerick P56 N224

EWC Code	Waste Type/Stream	Transport	Location	Facility	Location
20 03 04	Domestic Wastewater	Ward Waste Products Ltd (NWCPO-09-05619-03)	Knocknadiha Tournafulla Co Limerick V42 NV62	Woodstock Composting Ltd. (WFP-L-2023-221-R3-T1)	Lisnafulla Broadford Co. Limerick Limerick
		Derry White Skip Hire Limited (NWCPO-14-11356-07)	Mountplummer Broadford Co Limerick P56 N224	Cremins Farm Compost Ltd (WFP/L/2022/23A/R11)	Coolaleen Broadford Co Limerick

**Hazardous waste*

17.4 Assessment of Potential Effects

17.4.1 “Do-Nothing” Scenario

In evaluating the material assets associated with the proposed wind farm development, it is essential to consider the baseline scenario of taking no action (the "Do Nothing" option). Under this scenario, the existing natural and built environment would remain unchanged, with no construction, demolition or operational activities related to the wind farm taking place. Therefore the effects of the proposed development on material assets would not occur.

17.4.2 Construction phase

17.4.2.1 Forest and Hedgerows

Felling of some hedgerows and portions of existing tree plantations is required within and around wind farm infrastructure to accommodate the construction of the turbine foundations and associated hardstands, access tracks, turbine assembly and deposition areas. Trees in a radius of between 73.9m to 97.1m around each turbine will be felled as part of the project. Sections of conifer forestry that will be felled for this purpose are indicated in **Figure 17-14**. Additional tree line and hedge removal will be needed in some areas for the new access tracks and construction areas. Overall forestry felling of 14.4ha and 1,900m of hedgerow removal will be required which 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) and will follow the specifications set out in Forest Service’s ‘Forestry and Water Quality Guidelines’ (2000) and ‘Forest Harvesting and Environmental Guidelines’ (2000). 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. A felling licence application will be submitted once planning permission is received for the proposed development.

The following two areas of conifer plantation felling will be required:

1. For Turbines 4 and 5 and their associated hardstands and access tracks and deposition areas are indicated in **Figure 17-14**.
2. For the proposed substation, construction compound 1 and the access track from the site entrance to the substation and beyond to T6 indicated in **Figure 17-14**.

Replacement replanting of forestry in Ireland is subject to license in compliance with the Forestry Act 2014 as amended. The consent for such replanting is covered by the Forestry Regulations 2017 as amended (S.I. No. 191 of 2017). The total amount of felling proposed for the project is 14.4 hectares. 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. 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. For the purposes of this project, the location of any replanting (alternative afforestation) associated with the project will be outside any potential hydrological pathways of connectivity i.e., outside the catchments within which the proposed project is located and also at a distance so as to not create any potential cumulative effects.

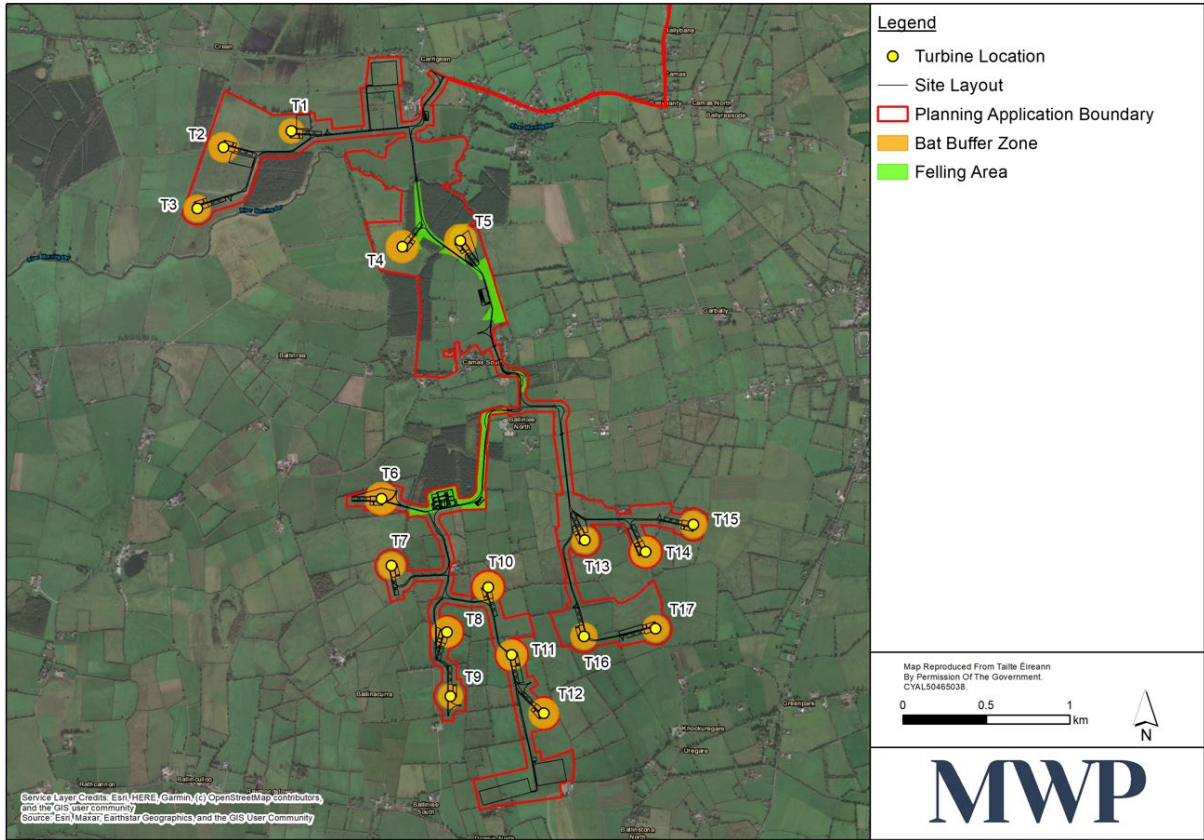


Figure 17-14: Areas where tree felling required

As is discussed in **Volume II, Chapter 06 Biodiversity** of this EIAR, in the absence of mitigation, there would be no replacement of forestry or hedgerow. The development would therefore result in a permanent loss of hedgerow and treeline habitat totalling a length of c. 2.8km (1,900m of hedgerows, 922m of treelines), as such there will be an **adverse, significant, local, permanent** and **direct** effect on these habitats.

Table 17-5: Construction Phase Effects – Forest, Treeline and Hedgerow

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Forestry, Treeline and Hedgerow	Adverse	Significant	Local	Permanent	Direct

17.4.2.2 Grid Capacity and Electrical Infrastructure

Within the site area of the wind farm project, there are existing overhead power lines in close proximity to some of the proposed turbine locations however none are located over turbine areas. The appointed contractor will coordinate with the ESB networks to ensure that work does not interfere with existing power infrastructure.

There are no other existing electrical services that would be affected by the proposed wind farm infrastructure or construction works.

The proposed Grid Connection Route will consist of approximately 27.6km of a 110kV underground cable buried in the public road (local and regional roads) and under access tracks within the wind farm site. The route generally

follows a southern direction on a mixture of regional and local roads. From the Eirgrid existing 220/110kV Killonan substation the route follows the N24 in a westerly direction and then proceeds along the L1171 for a short distance to the intersection with the L1170 (Ballysimon Commons rd) going south until it intersects with the R512. It then follows south along the R512 through Ballyneety down to Hollycross, then west onto the L1412 road, then south along the L8011 road to the R516 where it turns west towards the proposed site entrance. Where existing electrical services are located in the public road, the cable will avoid these services by providing ducting above, below or on the other side of the road corridor. Prior to construction being undertaken, a survey of underground services along the grid route will be undertaken to identify their location and to design the layout of the grid route cables to avoid any interference with or risk to the existing services and networks under the road. The relevant authorities will also be consulted during this phase and will approve the proposed approach and methods prior to the initiation of construction. This will avoid any effects on existing electrical networks along the grid route.

The accommodation works for the Turbine Delivery Route (TDR) will require some brief disruption to electrical supplies due to movement of existing overhead lines, refer to Turbine Delivery Route Report (EIAR **Volume III, Appendix 2C**) when the turbine components are being delivered to site. The ESB and relevant local authorities will be consulted on these proposed temporary changes and will need to approve them and facilitate the disconnection and reconnections of the affected lines and poles.

During the construction phase of the proposed development, in the absence of mitigation, there will be an **adverse, not significant, localised, brief to temporary** and **direct** effect on electrical infrastructure and supply. This level of significance is considered appropriate as the interaction with existing electrical infrastructure will be limited to brief to temporary disruptions associated with the accommodation works for the Turbine Delivery Route, and because no permanent loss or damage to electrical services is anticipated.

Table 17-6: Construction Phase Effects - Grid Capacity and Electrical Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Grid Capacity and Electrical Infrastructure	Adverse	Not Significant	Local	Brief to Temporary	Direct

17.4.2.3 Gas

GNI will be consulted prior to construction works. The locations of existing gas pipeline within the proposed wind farm site and along the grid connection route will be confirmed prior to the commencement of on-site works by carrying out trial holing. In addition, safe codes of practice will be applied by the appointed contractor during the construction phase. No turbines will encroach upon the main gas pipeline wayleave. Access track crossing and associated electrical cabling will be undertaken with consultation with GNI. Relevant separation distances will be complied with. EIAR **Volume III, Appendix 4L** contains an electrical interference assessment relating to potential interference from electrical cables to be installed as part of the proposed development and buried gas pipelines. Under both normal and fault conditions there are no safety risks to the pipeline, general public or livestock. Refer to **Planning Drawing No. 22635-MWP-00-00-DR-C-5442** for details on the protection to the pipeline at the access track/cable crossings.

Therefore, the construction phase will cause **no significant adverse effects** on gas infrastructure.

17.4.2.4 Telecommunication

Wind Farm Telecommunications

Results from Ai Bridges impact analysis indicate there are four radio links in the vicinity of the proposed wind farm development, these are listed in **Table 17-3** of **Section 17.3.5**. There will be no interference to existing radio links during the construction phase. Cranes will temporarily be in place and turbines will be erected gradually over the 24-month construction period.

Pre-mitigation construction effects are described as **adverse, slight, localised, temporary to short-term** and **direct**. This classification is considered appropriate as any potential effects are limited to temporary crane use and turbine erection during the construction period, which may briefly obstruct radio links but will not cause lasting disruption or loss of service. The scale of works relative to the overall telecommunications infrastructure in the area is minor, and the effects are both reversible and of short duration.

Grid Connection Route

Where existing telecommunications are located in the public road, the grid cable will avoid these services by providing ducting above, below or on the other side of the road corridor. Prior to construction being undertaken, a survey of underground services along the grid route will be undertaken to identify their location and to design the layout of the grid route cables to avoid any interference with or risk to the existing services and networks under the road. The relevant authorities will also be consulted during this phase and will approve the proposed approach and methods prior to the initiation of construction. This will avoid any effects on telecommunication lines along the grid route.

Pre-mitigation construction effects are described as **adverse, not significant, localised, temporary** and **direct**. This assessment is considered appropriate as the potential for interaction with existing telecommunications is limited to the installation of underground grid cables along public roads, where established procedures such as pre-construction service surveys and coordinated design are standard practice. Any disruption that could occur would be confined to a small area, temporary duration, and easily reversible through reinstatement of services. As no permanent loss, degradation, or long-term interruption of telecommunications infrastructure is anticipated, the overall effect is justifiably assessed as not significant.

Turbine Delivery Route

The temporary accommodation works for the Turbine Delivery Route (TDR) may result in some brief disruption to existing overhead telecommunication lines due to the temporary movement of existing overhead lines, refer to Turbine Delivery Route Report (EIAR **Volume III, Appendix 2C**)

Pre-mitigation construction effects on telecommunications are described as **adverse, not significant, localised, temporary** and **direct**. This conclusion is appropriate as the interaction with telecommunications infrastructure will be limited to temporary disconnections and reconnections of overhead lines required to facilitate turbine component delivery. These works will be carried out in consultation with the relevant service providers and local authorities, ensuring they are carefully planned, controlled, and reversible. Given the very limited duration, scale, and nature of these interventions, no long-term or widespread disruption to telecommunications services is expected, thereby justifying the assessment of effects as not significant.

Table 17-7: Construction Phase Effects -Telecommunications

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Telecommunications – Wind Farm	Adverse	Slight	Local	Temporary to Short-Term	Direct
Telecommunications – Grid Connection Route	Adverse	Not Significant	Local	Temporary	Direct
Telecommunications – Turbine Delivery Route	Adverse	Not Significant	Local	Temporary	Direct

17.4.2.5 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. Ballinlee 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.

In the absence of mitigation, the effects of cranes and turbines during the construction phase on aviation are considered **adverse, slight, localised, temporary** and **direct**. This classification is appropriate as the site is located well outside controlled airport airspace, with Shannon Airport approximately 32 km away, and the works will not intrude into recognised flight corridors. Any interaction with aviation is confined to the temporary use of cranes and turbine erection activities, limited in extent, and reversible once construction is complete. In the absence of mitigation, the use of cranes and the staged erection of turbines during construction could give rise to slight, temporary effects on aviation.

Table 17-8: Construction Phase Effects -Aviation

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Aviation - Turbines & Cranes	Adverse	Slight	Local	Temporary	Direct

17.4.2.6 Water and Wastewater Infrastructure

During construction works, there will be temporary compounds on the wind farm site. These temporary compounds will be set up upon commencement of the construction phase. They will be used as a secure storage area for construction materials, will also contain temporary site accommodation units to provide welfare facilities and enclosed wastewater management system. Sanitary wastewater will be collected in portable toilets. Disposal of sanitary wastes will be managed through a contract with a licensed waste contractor.

Water needs for construction activities will be limited to concrete truck chute washing, wheel wash, dust suppression and sanitary facilities.

It is estimated that 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 phase a 110kV underground cable will be installed in the public road. Prior to construction being undertaken, a survey of underground services along the grid route will be undertaken to identify their location and to design the layout of the grid route cables to avoid any interference with or risk to the existing services and networks under the road. The relevant authorities will also be consulted during this phase and will approve the proposed approach and methods prior to the initiation of construction. This will avoid any effects on existing water infrastructure along the grid route.

The TDR accommodation works are limited to ground level and above ground works. Consequently, there are expected to be no effects on underground water supply or wastewater networks along the TDR.

In the absence of mitigation, pre-mitigation construction effects on water infrastructure are considered **adverse, not significant, local, temporary to short-term and direct**. This assessment is appropriate because construction activities are limited to above ground works and carefully planned temporary compounds, with water supplied in bulk tanks and sanitary waste managed through licensed contractors.

Table 17-9: Construction Phase Effects -Water and Wastewater Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Water and Wastewater Infrastructure	Adverse	Not significant	Local	Temporary to Short-Term	Direct

17.4.2.7 Waste Management

During the course of the project, a certain amount of waste will be produced, this will be mainly during the construction phase.

The Developer will comply with Circular Economy requirements and ensure that waste is prevented as much as possible. Any potential waste will be treated as a by-product as much as possible and where it is possible, materials removed off-site will be re-used in accordance with the Article 27 notification procedure or treated to comply with Article 28 if practicable (under the European Union (Waste Directive) Regulations 2011 as amended). Other materials will be recycled where possible.

Any materials containing invasive species will be appropriately managed and sent to authorised facilities.

Table 17-10 outlines the anticipated types of major waste streams that will be generated by the project.

Table 17-10: Anticipated waste arising on site

Waste Item
Waste from Welfare Facilities
Waste Chemicals, Fuels and Oils
Packaging
Concrete
Waste Materials
Excavated Materials
Domestic Waste

In accordance with the waste hierarchy in Council Directive 98/2008/EC as amended by Directive 2018/851 on waste and Section 21A of the Waste Management Act 1996, as amended, and the principles of the Circular economy, waste management will be undertaken in order of priority, as follows:

1. Prevention;
2. Re-use;
3. Recycling;
4. Other recovery (including energy recovery); and
5. Disposal

Waste generation is principally avoided through planning and management of activities and good housekeeping. The majority of materials required for construction will be procured in bulk. By bulk procurement, the generation of small-sized containers and packaging is largely avoided and thus minimises the generation of unnecessary waste recycling or disposal.

Ireland's Circular Economy Programme (2021 to 2027) is the driving force for Ireland's move to a circular economy. The vision for the Programme, which is led by the EPA, is an Ireland where the circular economy ensures that everyone uses less resources and prevents waste to achieve sustainable economic growth. In line with the Waste Hierarchy, wherever possible, packaging will be returned to the originator for reuse ahead of recycling or disposal. Otherwise, waste packaging will be segregated and stored on site in appropriate skips within the construction compound and disposed of in accordance with waste management regulations. Skips will be clearly labelled for plastics, timber, steel and other waste materials to ensure segregation. Materials will be placed in these and can be reused as required during construction. 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. A list of nearby waste facilities is included in **Table 17-4**.

Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, cable wires, shuttering timber and building materials.

It has been calculated that there will be approximately 321,758m³ of material excavated during the construction of the proposed development. Excavated soils and subsoils from the wind farm site will be managed within the site, with material primarily reused for bunding, landscaping, and localised earthworks, while any remaining volumes will be placed in the designated permanent deposition areas and used to infill the borrow pits.

The waste from all other components of the proposed development will be stored in demarcated areas in the construction compounds and collected during and 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 an appropriate authorised facility.

The types of wastes generated will be similar to established construction waste streams and will not require unusual or new treatment options. Waste volumes will not be significant as to require new permitted treatment, storage and disposal facilities as there is sufficient capacity at licensed disposal or recycling facilities in proximity of the proposed development. Waste management procedures have been included in the Construction Environmental Management Plan (CEMP) (EIAR **Volume III, Appendix 2A**) and the Resource Waste Management Plan (EIAR **Volume III, Appendix 2B**)

In the absence of mitigation, the effects of waste generation and on the capacity of waste management facilities during the construction phase are considered **adverse, slight, local, temporary to short-term** and **indirect**. This assessment is appropriate because the project will generate typical construction wastes that can be managed with best practice by using established licensed facilities nearby, with no need for new treatment, storage, or disposal infrastructure.

Good housekeeping, segregation of materials, and adherence to Circular Economy principles will minimise the volume of waste produced and ensure that reuse, recycling, and safe disposal are implemented.

Table 17-11: Construction Phase Effects- Waste Management

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Waste Management	Adverse	Slight	Local	Temporary to Short-Term	Indirect

17.4.3 Operational Phase

17.4.3.1 Forestry and Hedgerow

The wind farm developments operational phase will not impede or deter either existing or future use of the local forest or hedgerow resources. Habitat and Species Management Plan (HSMP) (EIAR **Volume III, Appendix 6I**) outlines measures to maintain and enhance the conservation status of hedgerows and mixed broadleaved/conifer woodland as part of the operational phase.

Therefore, there will be **no significant adverse** effects on the local forest and hedgerow resources.

17.4.3.2 Grid Capacity and Electrical Infrastructure

The electricity generated by the proposed development will assist to displace the electricity produced from coal, oil and gas fired power plants, thus reducing emission from these power plants.

Once operational, there will be no direct emissions to the atmosphere from the wind farm.

The proposed development includes a 110kV substation to accommodate additional renewable energy to the national grid.

During the operational phase, the effects of the proposed wind farm on electricity generation and grid infrastructure are considered **positive, significant, regional, long-term and direct**. This classification is appropriate because the development will provide renewable electricity that displaces fossil fuel generation, thereby reducing greenhouse gas emissions in line with Ireland’s Climate Action Plan 2025 and commitments under the Paris Agreement. The 110kV substation ensures that the additional renewable energy can be effectively integrated into the national grid. The benefits are substantial in scale, enduring over the operational life of the wind farm, and directly contribute to national and regional energy and climate objectives.

Table 17-12: Operational Phase Effects - Grid Capacity and Electrical Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Grid Capacity and Electrical Infrastructure	Positive	Significant	Regional	Long Term	Direct

17.4.3.3 Gas

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

17.4.3.4 Telecommunications

Wind Farm Site

Network analysis, as detailed in the **Ai Bridges Telecommunications Impact Assessment**, available to view in this EIAR **Volume III, Appendix 17B**, indicates that none of the radio links which are in vicinity of the proposed development will be impacted. The 3d modelling analysis indicates that the Eir radio link between Slieveveagh and Tooreen will not be impacted. The clearance distance between the blade-tip of T17 and the Fresnel Zone (F1) of the radio link is 2.4m. To account for any potential impacts during the operational phase of the proposed development, mitigation measure solutions are considered and these are described in **Section 17.5.4**.

In the absence of mitigation, the operational effects on telecommunications are considered **adverse, slight, localised, long-term and direct**. This assessment is appropriate because the proposed development is unlikely to interfere with existing radio links, with detailed 3D modelling confirming sufficient clearance (e.g., 2.4 m between the blade tip of T17 and the Fresnel Zone of the Eir link). Any potential interactions are highly localised to the immediate vicinity of individual turbines and will persist only for as long as the wind farm operates, without causing widespread disruption.

Table 17-13: Operational Phase Effects - Wind Farm Telecommunications

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Telecommunication - Wind Farm Site	Adverse	Slight	Local	Long-Term	Direct

Grid Connection

For the operational phase, the grid infrastructure will have no effects on telecommunications because the telecommunications and grid infrastructure will already be installed, buried, and largely self-contained.

Maintenance works will be routine, brief to temporary and not expected to cause significant effect to telecoms infrastructure.

Turbine Delivery Route

There is a possibility that additional turbine components may need to be delivered from time to time during the operational phase. This may require additional temporary accommodation works along the delivery route similar to those during the construction phase. This would result in an **adverse, not-significant, local, brief to temporary** and **direct** effects on telecommunication lines associated with the TDR.

Table 17-14: Operational Phase Effects – Telecommunications Turbine Delivery Route

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Telecommunications - Turbine Delivery Route	Adverse	Not Significant	Local	Brief to temporary	Direct

17.4.3.5 Aviation

The Ai Bridges Aviation Review Statement has noted that in the event of a grant of planning, the proposed development will be required to register in the IAA Air Navigation Obstacle Data set. A copy of the **Ai Bridges Aviation Review Statement** is included in this EIAR **Volume III, Appendix 17A**. By incorporating aviation warning lighting within the design of the proposed wind turbines, effects are assessed to be **neutral, imperceptible, localised, direct** 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 for this element of the project. It is concluded that the operation of the proposed wind turbines will not result in any likely significant effect on Aviation.

Table 17-15: Operational Phase Effects - Aviation

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Aviation	Neutral	Imperceptible	Local	Long-Term	Direct

17.4.3.6 Water and Wastewater Infrastructure

During the operational phase, maintenance personnel will visit the substation building on a semi-regular basis. The daily average wastewater production during the operational phase is estimated from the average number of workers on site, which is expected to be 2 workers, resulting in a typical wastewater production rate of 100 litres per day, on days where workers are present on site. The wastewater generated during the operational phase at the on-site substation will be managed by a holding tank which is fitted with an alarm to indicate levels and when it is due to be emptied. The holding tank will be emptied by a permitted contractor and brought to a licensed wastewater treatment plant. Potable water required during the operational phase is estimated to be approximately 20 litres per day. This water will be supplied as bottled water. Welfare facilities during the operational phase will utilise rainwater harvesting at the substation. The volumes of both potable water and wastewater associated with the operational phase are considered small in scale and would therefore result in a **neutral, imperceptible, local, long-term** and **direct** effect on the water supply and waste water utilities.

Table 17-16: Operational Phase Effects - Water and Wastewater Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Water and Wastewater Infrastructure	Neutral	Imperceptible	Local	Long-Term	Direct

17.4.3.7 Waste Management

During the operational phase, minimal amounts of solid waste will be generated, which will be collected onsite and transported to a licenced disposal facility, or recycling facility by a waste hauling contractor.

During the operational phase, the effects of waste generation on the capacity of waste management facilities are considered **adverse, slight, local, indirect** and **long-term**. This assessment is appropriate because only minimal amounts of waste are expected, which will be managed in accordance with applicable regulations and transported to licensed disposal or recycling facilities. Hazardous materials, such as turbine gear and hydraulic oils, will be handled through established procedures, ensuring no adverse impacts on waste management capacity.

Table 17-17: Operational Phase Effects - Waste Management

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Waste Management	Adverse	Slight	Local	Long-Term	Indirect

17.4.4 Decommissioning Phase

17.4.4.1 Forest and Hedgerow

During the decommissioning phase, there may be tree or hedgerow removal required to access turbines which are to be removed. Transport of turbines off site may also require the felling of some trees and removal of hedgerow. Removal of hedgerows will be minimised wherever possible, removed out outside of the bird-nesting season, and any retained hedgerows will be protected with temporary buffers to prevent accidental damage. Removed hedgerow sections will be translocated or replaced nearby.

As with tree removal associated with the construction phase, tree removal 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) and will follow the specifications set out in Forest Service's 'Forestry and Water Quality Guidelines' (2000) and 'Forest Harvesting and Environmental Guidelines' (2000) or any other applicable regulations and guidelines introduced in advance of the period of decommissioning. 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 contractor assigned during the decommissioning phase will be required not to progress on 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.

In the absence of mitigation and replacement of forestry and hedgerow, the decommissioning phase of the proposed development is expected to have an **adverse, slight, local, permanent**, and **direct** effect on forest and hedgerow resources. Removal of hedgerow and treeline is not expected to be of similar levels that are required for the construction phase.

Table 17-18: Decommissioning Phase Effects - Forestry and Hedgerow

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Forestry and Hedgerow	Adverse	Slight	Local	Permanent	Direct

17.4.4.2 Grid Capacity and Electrical Infrastructure

Decommissioning of the wind farm will result in the removal of approximately 76 MW of renewable electricity from the national grid. The grid connection will remain a permanent part of the national grid and therefore

decommissioning is not foreseen for these elements. Decommissioning will involve removing the cable from the ducting but leaving the ducting and associated supporting structure in place. The ducting will not be removed if the environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving in situ. The assessment will be carried out closer to the time to take into account environmental changes over the project life. The removal of the ducts would also cause disruption to road users. Leaving the ducts in place would avoid disruption to road users without compromising the structure of the roadway.

It is also likely that the proposed on-site 110kV sub-station will remain in place and will previously have been taken in charge by the system operator, after the proposed wind farm is connected to the national electricity grid.

During decommissioning there will be an **adverse, significant, regional, permanent** and **direct** effect on power generation as a result of removal of electricity generating infrastructure and loss of approximately 76 MW of renewable electricity to the national grid. At the same time there will be a potential **direct positive** effect associated with the installed 110kV substation and underground grid infrastructure which will be used for electricity distribution in the locality and region and positively effect grid capacity.

Table 17-19: Decommissioning Phase Effects - Grid Capacity and Electrical Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Power Generation and Storage for Grid	Adverse	Significant	Regional	Permanent	Direct
Additional Grid Capacity Freed Up	Positive	Significant	Regional	Permanent	Direct

17.4.4.3 Gas

During decommissioning, there will be no encroachment on the existing pipeline which traverses areas of the proposed wind farm, as all works will be above ground and therefore no effects are predicted.

17.4.4.4 Telecommunications

Decommissioning will likely have no effects as turbines will be removed from the site, removing any potential obstruction to telecommunication links. The turbine components will be dismantled prior to being removed from site. Consequently, their removal from site will not have the same effects as those associated with the delivery of turbines.

17.4.4.5 Aviation

At the end of the estimated 35-year lifespan of the proposed development, the Developer will make the decision whether to repower or decommission the turbines. Any further proposals for development at the site during or after this time will be subject to a new planning permission application. If planning permission is not sought after the end of life of the turbines, the site will be decommissioned and reinstated with all 17 No. wind turbines and towers removed. Effects associated with the decommissioning phase will be similar to those of the construction phase. Removal of infrastructure will be undertaken in line with landowner and regulatory requirements and best practice applicable at the time of decommissioning.

During decommissioning, the effects are expected to be **positive, imperceptible, local, permanent, and direct**, as all infrastructure removal will follow regulatory requirements and best-practice methods that restore the site while minimising disruption to existing habitats and land use.

Table 17-20: Decommissioning Phase Effects - Aviation

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Aviation - Turbines & Cranes	Positive	Imperceptible	Local	Permanent	Direct

17.4.4.6 Water and Wastewater Infrastructure

During decommissioning works, temporary compounds will be set up and used as a secure storage area for materials, waste materials and contain temporary site accommodation units to provide welfare facilities and enclosed wastewater management system. Sanitary wastewater will be collected in portable toilets and potable water will be brought to site by tanker. Disposal of sanitary wastes will be managed through a contract with a licensed waste contractor to a wastewater treatment plant. During decommissioning, there will be no impact on in-road water infrastructure as the cable ducting will be left in-situ.

The effects on existing water and wastewater infrastructure during the decommissioning phase are expected to be **neutral, imperceptible, local, temporary to short-term, and direct**, as all sanitary and wastewater management will be controlled through portable systems and licensed contractors, with no disturbance to in-situ cable ducting or other existing infrastructure.

Table 17-21: Decommissioning Phase Effects - Water and Wastewater Infrastructure

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Water and Wastewater Infrastructure	Neutral	Imperceptible	Localised	Temporary to Short-Term	Direct

17.4.4.7 Waste Management

During the decommissioning phase, waste will be kept to a minimum. The majority of the materials on site will be recycled.

Domestic type waste generated by contractors will be collected on site, stored in an enclosed skip at the temporary compounds and disposed of at an appropriate authorised facility. Tracks, hardstanding areas and foundations will be left in situ with hardstands and foundations covered over and revegetated. All non-recyclable or reusable materials will be disposed of in a licenced waste facility.

At present, between 85% and 95% of turbine components can be recycled. Wind turbine blades remain the most difficult item to recycle however, Ballinlee Green Energy Ltd. have committed to reuse, recycle or otherwise recover all wind turbine blades from the decommissioned wind farm, and avoid blades going to landfill. Technology has now been developed that allows for the breakdown of polymer composites to reuse them as new products that can substitute materials such as virgin plastics, steel and concrete. Wind turbine blades are also

being repurposed for a range of applications, including artificial reefs, playground equipment, street furniture, and materials for domestic construction.

During the decommissioning phase, the effects on waste and the capacity of waste management facilities are expected to be **adverse, slight, local, temporary to short-term**, and **indirect**, as a small volume of non-recyclable materials will still require disposal at licensed facilities despite extensive recycling and repurposing of turbine components.

Table 17-22: Decommissioning Phase Effects - Waste Management

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Waste Management	Adverse	Slight	Local	Temporary to Short-Term	Indirect

17.5 Mitigation and Monitoring Measures

Mitigation measures have been outlined to reduce or eliminate potential effects on the receiving environment.

17.5.1 Forestry and Hedgerow

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, operation, or decommissioning 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.

As is stated in **Volume II, Chapter 06** Biodiversity of this EIAR, there will be a permanent combined hedgerow and treeline loss of 2.8 m. Replanting in appropriate areas within the Planning Application Boundary will mitigate for this loss and supplement existing hedgerows. The total length of new and translocated hedgerow planting will be c. 3,970 m, resulting in a net gain of c. 1,574.7 m.

Hedgerow planting will include the following, locally sourced species: alder *Alnus glutinosa*, blackthorn *Prunus spinosa*, holly *Ilex aquifolium*, bramble *Rubus fruticosus*, hazel *Corylus avellana*, dog-rose *Rosa canina*, spindle *Euonymus europaeus* and hawthorn *Crataegus monogyna*.

Replanting will be in place at the earliest opportunity after the commencement of construction works, to facilitate early establishment/growth, but will not be put at risk of accidental damage due to ongoing construction works (e.g., machinery movement, material storage).

The site layout was designed to utilise existing tracks, and the infrastructural footprint largely targets lower value habitats, including improved grassland. Likewise, areas where felling is required to implement bat feature buffers have targeted commercial forestry and the lengths of treelines and hedgerows that will be removed will be kept to a minimum. Furthermore, the number of locations where access tracks are required to punch through hedgerows/treelines has been limited and the areas to be removed will be kept to a minimum.

Where works are occurring in close proximity to hedgerows, temporary and permanent access tracks will not be sited within 3 m from the edge of the hedgerow vegetation, unless access tracks in such locations are being utilised. Existing agricultural tracks will be used by machinery traffic associated with construction works. No other construction works or activities will be located within 5 m of hedgerow vegetation.

A pre-construction assessment of hedgerows and treelines adjacent to the works corridor, targeting sections that will be retained post-construction, will be undertaken by an appropriately qualified arboriculturist. Root Protection Areas (RPA), will be implemented in line with BSI (2012) at locations where construction activities, including excavation, access and storage of materials, will be limited, to avoid adverse effects on the health of trees/shrubs adjacent to the area of construction works.

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

17.5.2 Grid Capacity and Electrical Infrastructure

Mitigation by design has been adopted whereby the grid connection methodology at the proposed development has been selected to utilise existing built infrastructure. All electrical and other services within the public road will be identified prior to construction of the 110kV underground grid route cable.

The contractor will put the following 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:

- Carry out a full survey of all underground and overhead electrical and utility services along the 110kV grid connection route prior to construction.
- Identify exact locations of live overhead lines, underground cables, and other utilities.
- Ongoing consultation with ESB Networks to ensure safe working practices and compliance with their guidelines.
- Agree in advance any temporary disconnections or diversions of electrical services.
- Notify ESB Networks before any works near live infrastructure.
- Implement exclusion zones and physical barriers when working near live overhead or underground lines.
- Ensure all staff and contractors are trained in working safely near live electrical infrastructure.
- Use protective equipment and follow ESB-approved procedures for working adjacent to live services.
- Where diversion or temporary relocation is necessary, carry out works in a controlled and planned sequence to prevent interruptions.
- Confirm the location of all Gas Networks Ireland high- and medium-pressure pipelines through trial holes prior to construction.
- Maintain safe distances from all pipelines; no turbines or infrastructure will encroach on pipeline wayleaves.
- Follow GNI codes of practice for working near pipelines.
- Provide staff training on emergency procedures in case of accidental pipeline contact.
- Maintain emergency contacts for ESB Networks and Gas Networks Ireland on site.
- Implement immediate shutdown and evacuation procedures if accidental damage occurs.

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.

The proposed development will not result in any significant effects on grid capacity but will provide a potentially positive effect on the electricity supply infrastructure.

17.5.3 Gas

Desktop study revealed that a high-pressure Gas Networks Ireland (GNI) pipeline will cross both the northern section of the main wind farm site boundary and also the southern section. The location of the existing gas pipeline within the proposed wind farm site and along the grid connection route will be confirmed prior to the commencement of on-site works by completion of trial holes. In addition, safe codes of practice will be applied by the appointed contractor during the construction phase to avoid the existing gas pipeline which traverses the

site. No turbines will encroach upon the main gas pipeline wayleave and the gas pipeline will be outside the electrical safety exclusion zone.

17.5.4 Telecommunications

Results from the impact analysis indicate that there are four radio links in the vicinity of the proposed wind farm development.

The Ai Bridges, Ballinlee Telecommunications Impact Assessment (EIAR **Volume III, Appendix 17B**) has advised the following mitigation measures to offset potential impacts:

In the event of impacts due to T17 on the Eir radio link from Slieveareagh to Tooreen the following mitigation solutions will be discussed with Eir and the most appropriate solution will be carried out:

- i) Re-locate the antenna at Tooreen to the new telecoms mast which has been installed at Tooreen.
- ii) Route the EIR Service into Tooreen from an Alternative Feeder Site.

These mitigation measures are described in more detail in the Telecommunications Impact Assessment and have also been included below.

Re-locate the antenna at Tooreen to the new telecoms mast which has been installed at the site

An option for mitigation for any potential impacts on the radio link between Slieveareagh and Tooreen would be to relocate the radio antenna at Tooreen from the existing 12m telegraph pole to the new 24m high lattice telecoms mast which has been recently installed at the site, as shown in **Figure 17-15**.

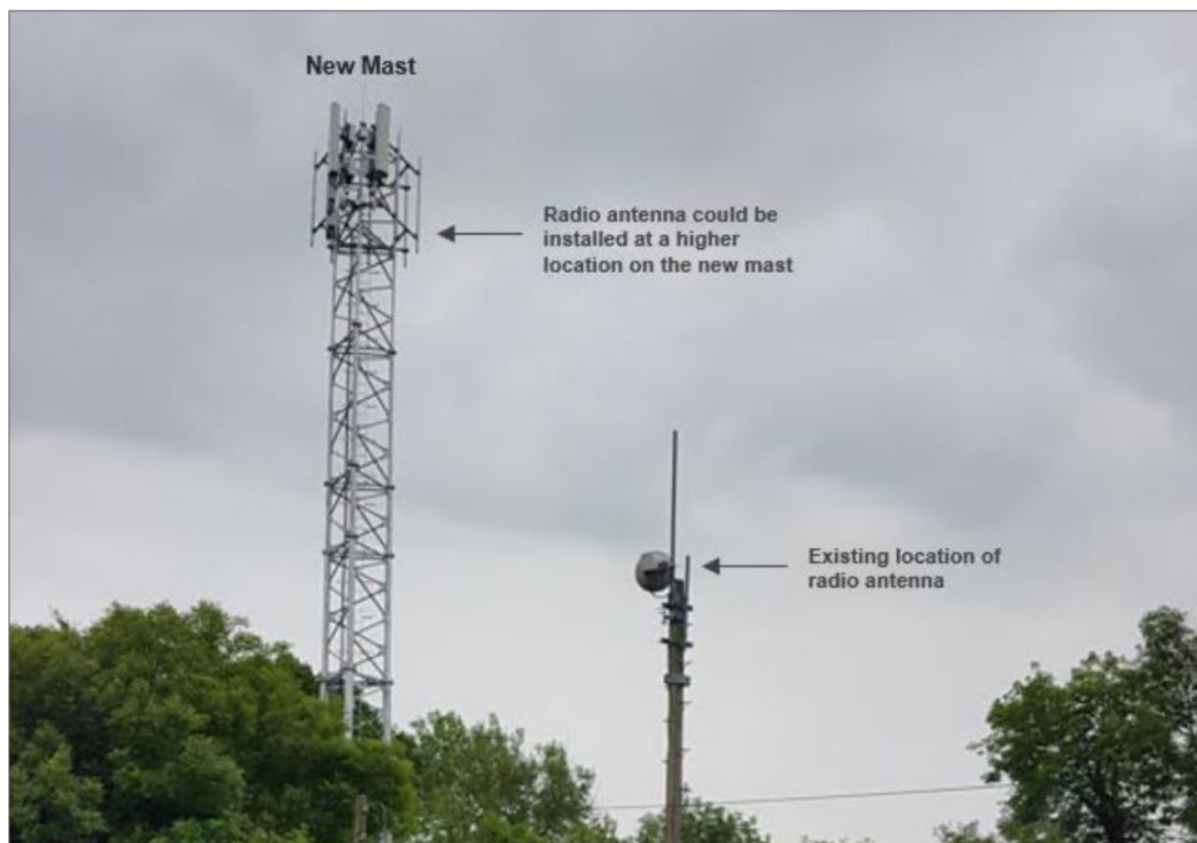


Figure 17-15: New Telecoms Mast at Tooreen

3d analysis indicates that the increase in antenna height at the Tooreen end of the radio link, would result in a clearance distance of 8.6m between the blade-tip of T17 and the Fresnel Zone of the radio link.

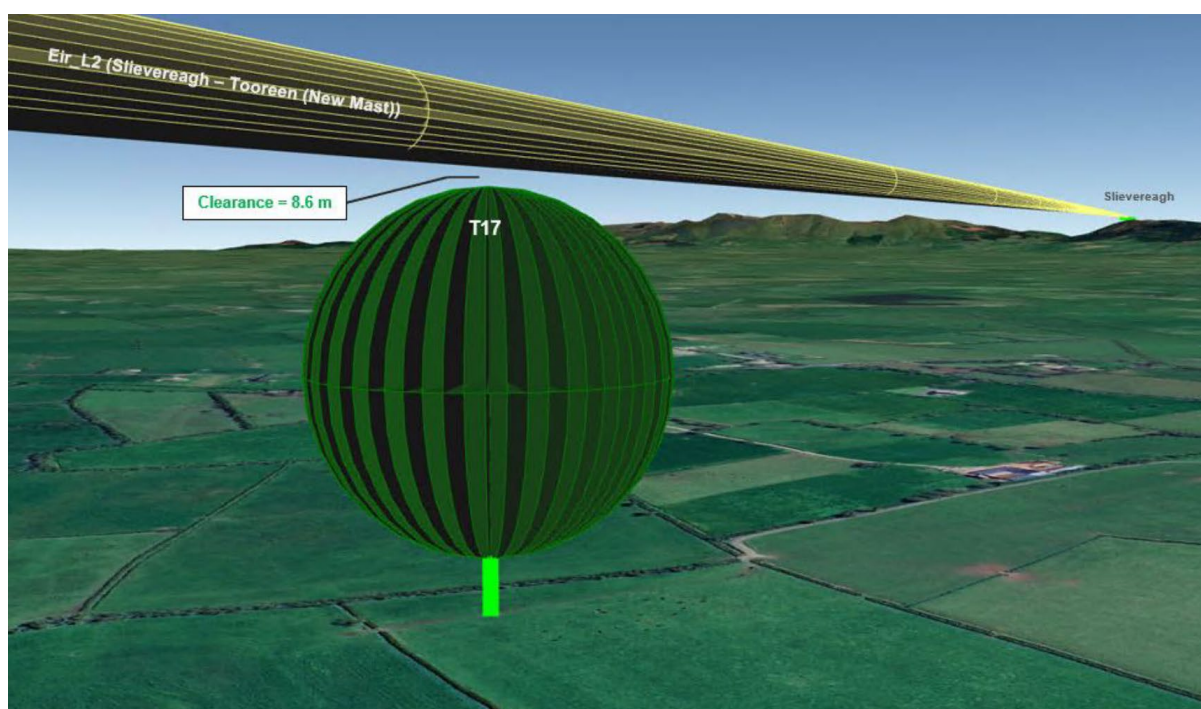


Figure 17-16: View of Eir radio link – Tooreen Antenna on New Mast

Route the Eir Service into Tooreen from an Alternative Feeder Site

An alternative option to mitigate for any potential impacts on the radio link between Slieveveagh and Tooreen would be to use an alternative Eir POP site to provide a service into Tooreen.



Figure 17-17: Example of how an alternative feeder-site could be used to mitigate against an obstructing turbine

The Radio Link Path Profile and Radio Link Budget are based on the following ITU-R recommendations:

- ITU-R P.525-2
- IT-R P.526-11
- ITU-R P.676-8

Path Profile – Ballyhoura to Tooreen

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

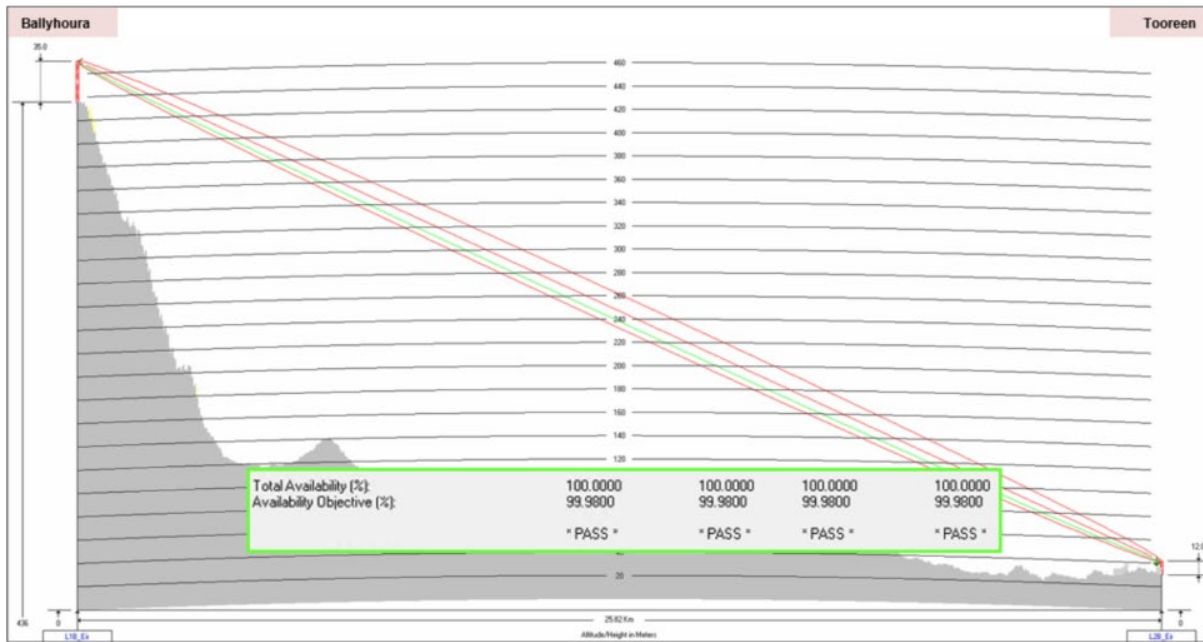


Figure 17-18: Path Profile – Ballyhoura to Tooreen

In addition to the preceding, in the event of interference to television and telecommunication services arising from the wind farm development, the applicant will work with telecommunication providers to remedy any issues of interference to affected communication links. Appropriate mitigation measures can be implemented such that there will either be an imperceptible effect, or no effect, on surrounding reception as a result of the proposed development, with the solution to interference with TV reception or communication links dependent on where the residence receives signal from.

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.

All telecommunications lines affected by the grid route or TDR accommodation works will be identified prior to construction.

17.5.5 Aviation

Whilst the proposed development will not impede aircraft, IAA Electronic Air Navigation Obstacle Data set identified obstacles as objects whose height above ground level is 90m or higher, affecting air navigation. Irish Wind Energy Association (IWEA) Guidelines have set out the following measures to ensure that pilots of aircraft are fully aware of the presence of wind turbines.

- All turbines and meteorological masts having a height of 90m, or more are promulgated in the Irish Air Navigation Obstacle database;
- Wind turbines or any structure exceeding 90m in height may require appropriate aviation warning lighting as agreed with IAA;
- The IAA should be informed 30 days in advance of the erection of any structure exceeding 45m in height.

Having regard to the prior measures:

- If permitted, the wind farm will be fitted with Aeronautical Obstacle Warning Lights in accordance with civil aviation industry and regulatory standards. Subject to further consultation with the IAA.
- The developer will provide the IAA with as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location.
- The developer will notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.

17.5.6 Water and Wastewater Infrastructure

There are existing watermains located along the R516 to the north of the proposed development as well as a watermain located along the L1414 which is located between the north and south sections of the proposed development.

There are also watermains underground along the grid route including the R512 road where most of the grid connection is located.

Pre-construction surveys will be completed to avoid disturbance to existing watermains.

The Contractor will 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 Uisce Éireann or other relevant authorities.

All works affecting the water and wastewater infrastructure will be carried out in ongoing consultation with the local authorities and service providers and will be in compliance with any requirements or guidelines they may have.

17.5.7 Waste Management

All waste for offsite treatment/disposal is to be stored temporarily in appropriate storage areas. The areas in which wastes are stored on site are 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** (EIAR **Volume III, Appendix 2A**). All personnel working on site will be trained in pollution incident control response, and an emergency response will be prepared as part of the CEMP.

17.6 Residual Effects

The residual effects section outlines the degree of environmental change that will occur after the proposed mitigation measures have taken effect. **Table 17-23** provides a summary of the residual material effects for the proposed development. There are no predicted significant residual effects post mitigation.

Table 17-23: Residual Effects

Impact	Effect (Pre-Mitigation)	Mitigation Measures	Residual Effect (Post-Mitigation)
Construction Phase			
Forestry and Hedgerow	Adverse, Significant, Local, Permanent and Direct	Refer to Section 17.5.1	Neutral, Imperceptible, Local, Short-Term, Direct and Likely
Grid Capacity and Electrical Infrastructure	Adverse, Not Significant, Local, Brief to Temporary and Direct	Refer to Section 17.5.2	Neutral, Imperceptible, Local, Brief to Temporary and Direct
Gas	No effects	No mitigation measures required	No effects
Telecommunications – Wind Farm	Neutral, Slight, Local, Temporary to Short-Term and Direct	Refer to Section 17.5.4	Neutral, Imperceptible, Local, Temporary to Short-Term and Direct
Telecommunications- Grid Connection Route	Adverse, Not Significant, Local, Temporary and Direct	Refer to Section 17.5.4	Neutral, Imperceptible, Local, Temporary and Direct
Telecommunications- Turbine Delivery Route	Adverse, Not Significant, Local, Temporary and Direct	Refer to Section 17.5.4	Neutral, Imperceptible, Local, Temporary and Direct
Aviation	Adverse, Slight, Local, Temporary and Direct	Refer to Section 17.5.5	Neutral, Imperceptible, Local, Temporary and Direct
Water and Wastewater Infrastructure	Adverse, Not Significant, Local, Temporary to Short-Term and Direct	Refer to Section 17.5.6	Neutral, Imperceptible, Local, Temporary to Short-Term and Direct
Waste Management	Adverse, Slight, Local, Temporary to Short-Term and Indirect	Refer to Section 17.5.7	Neutral, Not Significant, Local, Temporary to Short-Term and Indirect
Operational Phase			
Forestry and Hedgerow	No effects	No mitigation measures required	No effects
Grid Capacity and Electrical Infrastructure	Positive, Significant, Regional, Long Term, and Direct	No specific mitigation measures proposed	Positive, Significant, Regional, Long Term, and Direct

Impact	Effect (Pre-Mitigation)	Mitigation Measures	Residual Effect (Post-Mitigation)
Gas	No effects	NA	No effects
Telecommunications – Wind Farm	Adverse, Slight, Local, Long-Term and Direct	Refer to Section 17.5.4	Neutral, Imperceptible, Local, Long-Term and Direct
Telecommunications- Turbine Delivery Route	Adverse, Not Significant, Local, Brief to Temporary and Direct	Refer to Section 17.5.4	Neutral, Imperceptible, Local, Long-Term and Direct
Aviation	Neutral, Imperceptible, Local, Long-Term and Direct	Refer to Section 17.5.5	Neutral, Imperceptible, Local, Long-Term and Direct
Water and Wastewater Infrastructure	Neutral, Imperceptible, Local, Long term and Direct	Refer to Section 17.5.6	Neutral, Imperceptible, Long term and Direct
Waste Management	Adverse, Slight, Local, Long Term and Indirect	Refer to Section 17.5.7	Adverse, Not Significant, Local, Long Term and Indirect
Decommissioning Phase			
Forestry and Hedgerow	Adverse, Slight, Local, Permanent and Direct	Refer to Section 17.5.1	Neutral, Imperceptible, Local, Temporary and Direct
Grid Capacity and Electrical Infrastructure- Power Generation and Storage for Grid	Adverse, Significant, Regional, Permanent and Direct	No specific mitigation measures proposed	Adverse, Significant, Regional, Permanent and Direct
Grid Capacity and Electrical Infrastructure- Additional Grid Capacity Freed Up	Positive, Significant, Regional, Permanent and Direct	No mitigation measures required	Positive, Significant, Regional, Permanent and Direct
Gas	No effects	NA	No effects
Telecommunications	No effects	NA	No effects
Aviation	Positive, Imperceptible, Local, Permanent and Direct	No mitigation measures required	Positive, Imperceptible, Local, Permanent and Direct
Water and Wastewater Infrastructure	Neutral, Imperceptible, Localised, Temporary to Short-Term and Direct	Refer to Section 17.5.6	Neutral, Imperceptible, Localised, Temporary to Short-Term and Direct
Waste Management	Adverse, Slight, Local, Temporary to Short-Term and Indirect	Refer to Section 17.5.7	Adverse, Not Significant, Local, Temporary to Short-Term and Indirect

17.7 Major Accidents and Disasters

In accordance with the requirements of the EIA Directive (2014/52/EU), consideration has been given to the potential risk of major accidents and disasters which could have significant adverse effects on the environment.

- **Gas Infrastructure:** A high-pressure GNI pipeline crosses both the northern and southern sections of the wind farm site boundary. GNI have been consulted, and all works in proximity to pipelines will be undertaken in strict compliance with GNI requirements. Setback distances will be maintained, and crossing works will be supervised and agreed with GNI. This will ensure that the risk of accidental strike or leakage is minimised.
- **Electricity Grid:** Connection to the electricity grid will follow ESB Networks protocols. All works will be carried out by authorised personnel in compliance with HSA and ESB safety codes, eliminating the risk of electrocution or grid disruption.
- **Aviation:** Correspondence was issued to the Irish Aviation Authority; however, no response was received. The site is not within a designated airport safeguarding zone, and the development is not of a height or nature likely to pose a risk to aviation safety. On this basis, no significant effects are predicted.
- **Telecommunications:** No critical broadband or telecommunications assets are located within the development footprint. Consultation with relevant providers has not identified any issues.

17.8 Cumulative Impacts and Effects

The cumulative effects of the proposed development have been assessed with existing, proposed and permitted developments in the surrounding area (See **Section 1.4.4 of Volume II, Chapter 01** Introduction of this EIAR). Much of the surrounding area accommodates residential dwelling and agricultural buildings. A list of significant planning applications has been included in **Volume II, Chapter 01** Introduction of this EIAR.

There are no developments in proximity to the proposed development which would cause significant cumulative effects on forestry resources or wastewater infrastructure.

There is potential for cumulative effects to occur at existing waste management facilities if the construction of the proposed wind farm overlaps with any of these projects. Capacity of local waste management facilities may be affected. This has potential to cause a **slight, adverse** and **localised** effect on local waste management facilities.

The energy produced by the proposed Ballinlee wind farm development would positively accumulate with other renewable energy developments in the region to advance in delivering local, regional, and national green energy targets, as discussed in **Volume II, Chapter 01** Introduction of this EIAR. Other wind farm developments within 20km of the proposed development are illustrated in **Figure 17-19**.

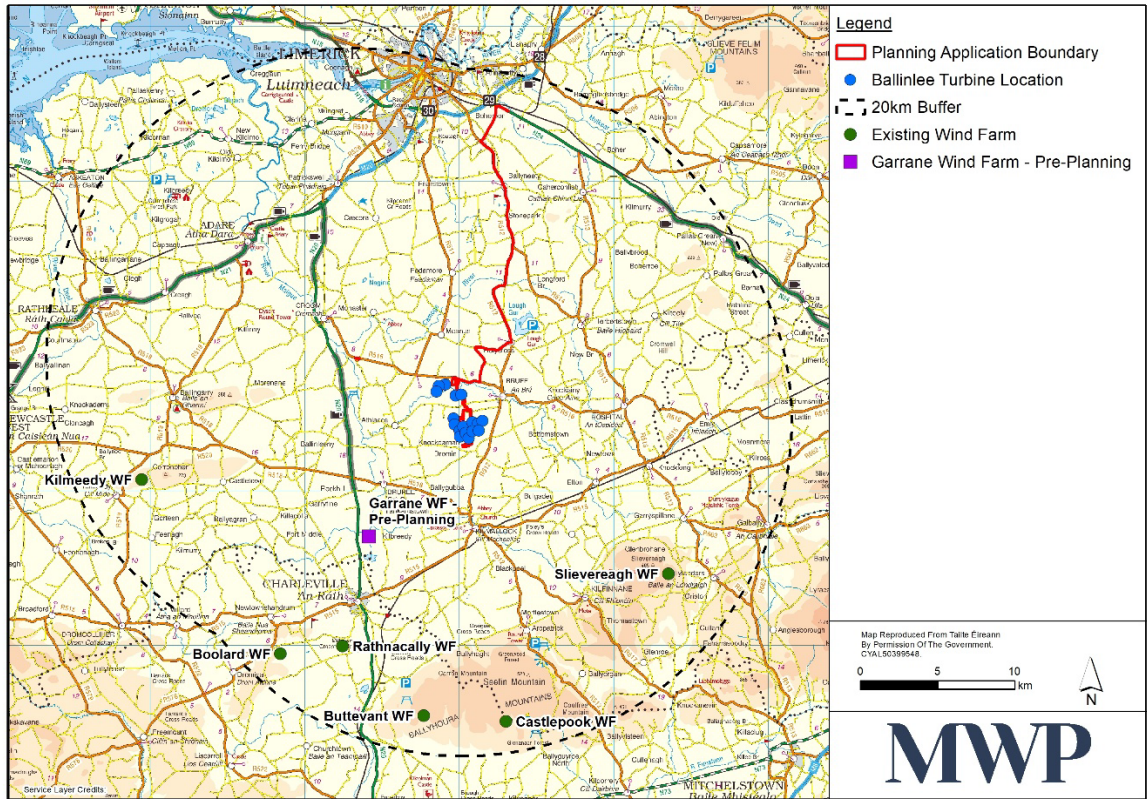


Figure 17-19: Neighbouring Wind Farms within 20km Buffer

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

The proposed wind farm development will positively cumulate with other renewable energy developments in the region to advance in delivering local, regional and national green energy targets.

17.9 References

Circular Economy And Miscellaneous Provisions Act 2022;

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

ESB Dial Before You Dig Maps (DBYD);

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

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

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

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

Guidelines on the preparation of the EIAR (European Commission 2017);

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

A Waste Action Plan for a Circular Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025 (Government of Ireland);

Landfill Directive (EU) 2024/1785 (EU, 2024a);

The European Union Waste Framework Directive Council Directive 98/2008/EC as amended by Directive 2018/851 (EU, 2018b);

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

European Directive 2011/92/EU as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive);

Planning and Development Regulations 2001 (as amended);

Revised National Planning Framework (NPF,2025);

Limerick County Development Plan 2022-2028 (as relevant to infrastructure and utilities);

Electricity Regulation Act 1999 (as amended);

The European Communities (Internal Market in Electricity) Regulations 2000 (as amended);

Climate Action and Low Carbon Development (Amendment) Act 2021;

EirGrid's Transmission Development Plan (TDP) 2024-2033;

Gas Act 1976 (as amended);

Gas (Interim) (Regulation) Act 2002;

Safety in Gas Works Regulations (S.I. NO. 299/2007);

Communications Regulation Act 2002 (as amended);

European Electronic Communications Code Directive (EU) 2018/1972;

ComReg Guidance and licensing requirements;

European Union (Drinking Water) Regulations 2023 (S.I. No. 99/2023, as amended);

European Union (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001, as amended);

Water Services Acts 2007–2017;

Waste Management Acts 1996–2011 (as amended);

Circular Economy and Miscellaneous Provisions Act 2022;

European (Waste Framework Directive) Regulations 2011 (S.I. No. 126 of 2011);

National Waste Management Plan for a Circular Economy (2022);

Hazardous Waste Management Plan for Ireland (2021–2027);

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

Irish Aviation Authority Act 1993 (as amended);

Irish Aviation Authority (Obstacles to Aircraft in Flight) Order 2005 (S.I. No. 215/2005);

ICAO Annex 14 Aerodromes, Volume I;

Wind Energy Association (IWEA) Guidelines on Wind Energy and Aviation (2012).