

15 MATERIAL ASSETS

15.1 INTRODUCTION

This chapter describes the Material Assets that are potentially impacted by the proposed development. A full description of the proposed development, development lands and all associated project elements is provided in **Chapter 2** of this EIAR. The purpose of this assessment is to identify relevant Material Assets that are within the vicinity of the proposed development site or will be utilised by the development, determine the impact, if any, on these resources, and propose mitigation where necessary to ensure that they are used in a sustainable manner.

15.1.1 Scope of Assessment

The assessment considers the entirety of the proposed development to include the wind turbines and the associated site infrastructure, including the overhead and underground grid connection options.

According to the EPA's Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015), Material Assets are "Resources that are valued and that are intrinsic to specific places. They may be of either human or natural origin. The assessment shall be concerned primarily with ensuring equitable and sustainable use of resources". The topics to be examined in an assessment of the impact of a development on Material Assets are set out in the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (Draft) (EPA, August 2017). Material assets can be broadly divided into Roads and Traffic; Built Services namely Electricity, Telecommunications, Water Supply Infrastructure, Sewerage and Gas; and Waste Management. **Table 15-1** outlines the topic areas to be examined.

Table 15-1: Material Assets and Topics to be Covered in Assessment

Material Asset	Topics to be Covered
Roads & Traffic	Construction Phase Operational Phase Unplanned Events (i.e. Accidents)
Built Services	Electricity Telecommunications Water Supply, Wastewater Infrastructure and Gas
Waste Management	Management of Solid and Liquid Wastes

The 2017 Draft Guidelines state: "The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."

Given the projects setting within an active forestry plantation, Forestry Resources have also been considered as a relevant material asset.

Therefore, based on a review of the proposed development and consultation with the aforementioned guidance, the material assets relevant to wind farm projects and associated grid connections, which have been brought forward for assessment in this chapter are as follows.

- Roads and Traffic
- Electricity Supply and Infrastructure
- Telecommunications and Aviation
- Water and Wastewater Infrastructure
- Waste Management
- Forestry Resources

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 impact on water resources is considered in the assessment on the surface water and groundwater resource provided in EIAR **Volume 2, Chapter 8 Water**. No further assessment on this topic is included in this chapter.
- The assessment on the land and geological resource is presented in **Chapter 9 Lands and Soils**. No further assessment on this topic is included in this chapter.
- Assimilative capacity of the air resource is considered in the assessment provided in **Chapter 10 Air and Climate**. No further assessment on this topic is included in this chapter.
- The assessment on Cultural Assets is provided in **Chapter 14 Cultural Heritage**. No further assessment on this topic is included in this chapter.

15.1.2 Methodology

The methodology used for the study included desk-based research and site visits. The desk study and material assets assessment were carried out in accordance with the following regulations and guidelines:

- The requirements of EC Directives and Irish Regulations regarding Environmental Impact Assessment;
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, September 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of the Environment, Community and Local Government [DoECLG], 2013);
- European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (2017);
- Guidelines on the Information to be Contained in Environmental Impact Statements (Draft) (Environmental Protection Agency, August 2017).

The methodology recommended in the aforementioned 2017 EPA Draft Guidelines has been followed. The chapter is based on the data gathered during the assessment process. It applies accepted methodologies in determining if impacts will be significant and recommends mitigation measures to avoid or reduce impacts where possible. Any likely impact the proposed development may have on those assets is assessed with the aim of ensuring equitable and sustainable use of resources.

15.1.3 Assessment Criteria

The assessment is based on the EPA Glossary of Impacts, included in the aforementioned 2017 EPA Draft Guidelines.

15.1.4 Statement on Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the other material assets within the scope of this assessment.

15.1.5 Competency of Assessors

The assessment was completed by Sinéad Ryan BSc MSc of MWP. Sinéad is a Senior Environmental Consultant and holds a BSc in Environmental Science and an MSc in Environmental Engineering. Sinéad is an experienced and competent environmental professional having worked for more than 20 years in environmental consultancy, environmental engineering and environmental science roles in both the private and public sectors. Sinéad has extensive experience in project managing all aspects of EIA and has completed EIAR chapters for numerous projects. More specifically, she has completed material asset impact assessments for a wide range of projects during her career to date including renewable energy, quarries, industrial and commercial developments.

The Traffic and Transportation Assessment (**Appendix 15-1**) was prepared by Seamus Quigley BE CEng MIEI MCIHT of MWP. Seamus Quigley has 30 years' experience in transport planning and traffic engineering projects, including EIS/EIAR traffic and transportation chapters, traffic impact assessments, traffic management studies, mobility management plans, traffic modelling studies, feasibility studies and road safety audits. He is a Chartered Engineer with Engineers Ireland, and also a member of the Chartered Institution of Highways and Transportation. He joined Malachy Walsh and Partners in 2007, having spent over 16 years with Atkins.

15.2 EXISTING RECEIVING ENVIRONMENT

15.2.1 Road and Traffic

15.2.1.1 Existing Road Network

The proposed development is located within a rural area of north Kerry. It is located approximately 4km southeast of Ballylongford village and 6km north of Listowel town. The area surrounding the proposed development site is well connected by a network of local and regional roads. The proposed development site can be accessed via local road L-6021 at the northeast or from L-1091 west of the site as shown in **Error! Reference source not found.**



Figure 15-1: Local Road Network

15.2.1.2 Proposed Access for Construction Deliveries, Turbine Components & Operational Phase

Primary access to the proposed development site will be provided via a new entrance off the L6021 local public road on the north eastern side of the proposed development site. This will be the main site entrance during both the construction and operational phases of the development. A second temporary entrance to facilitate construction and access will be formed on the local public road L1009 on the western side of the site. The layout of the site stretches in an east-west configuration and thus having two entrances will assist during the construction stage of the development. Once the construction phase of the project is complete the western entrance will then be closed with controlled access. The eastern entrance off the L6021 will remain as the permanent access for the operational

life of the wind farm development. See **Figure 15-2** showing the location of each site entrance. The wind turbine component deliveries will be via the eastern entrance only.

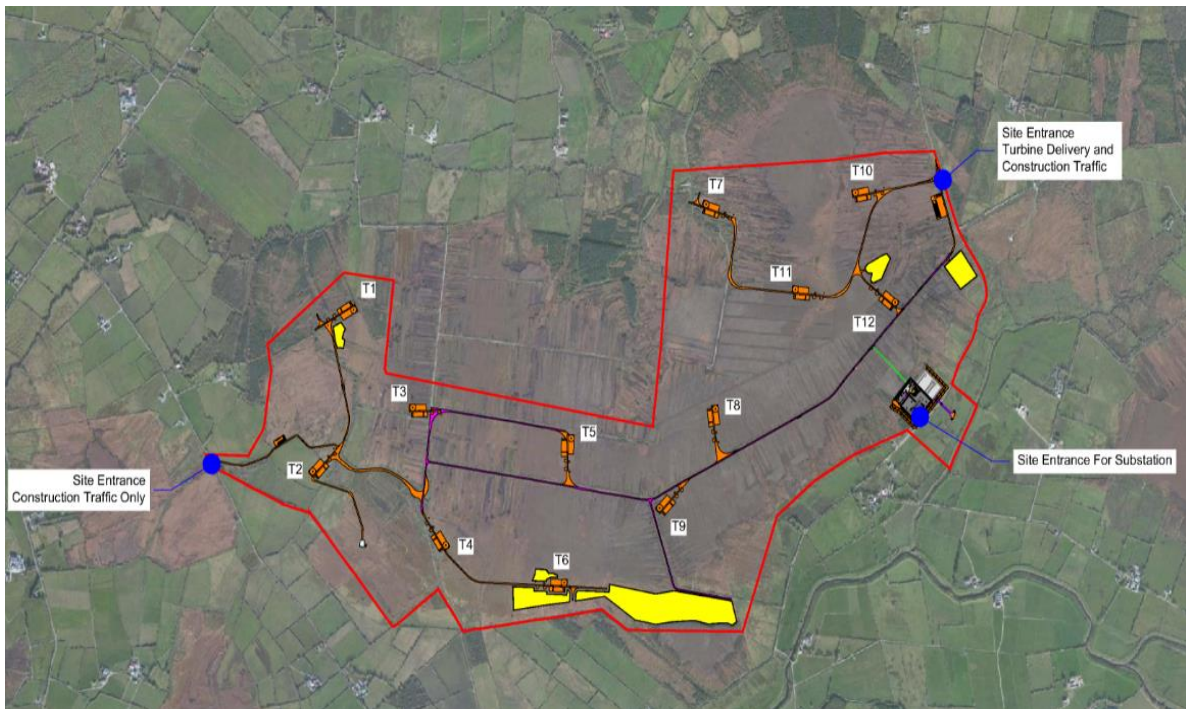


Figure 15-2: Proposed Site Entrances

It is anticipated that the turbine components will be delivered by sea to Foynes Port, Co. Limerick. The components will be delivered to Foynes Port in Co Limerick by sea and transported to site along the national, regional and local road network as follows:

- Starting at Foynes Port;
- Travelling westwards along the N69 coastal road towards Tarbert.
- At Tarbert follow the R551 in a south westerly direction to the intersection of the L6021;
- Then due south west along the L6021 to Leanamore Crossroads.
- Follow the L6021 in a southern direction to the eastern site entrance.

A turbine delivery route assessment has been undertaken for this project. A full detailed report is provided in **Volume 3, Appendix 3-1**. **Figure 15-3** shows the turbine delivery route proposed for this project. The majority of the proposed route to the proposed development site has previously been used for turbine component delivery to the operational Leanamore Wind Farm (Planning Refs 11/299). An Autotrack assessment drawing for the wind turbine blades (refer to **Appendix 3-1**) has revealed a requirement for some minor and temporary works in order to achieve delivery. In some cases, temporary accommodation works are required along the turbine delivery route such as hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening. Any updates to existing road infrastructure will be carried out in advance of turbine deliveries and following consultation and agreement with Kerry County Council.

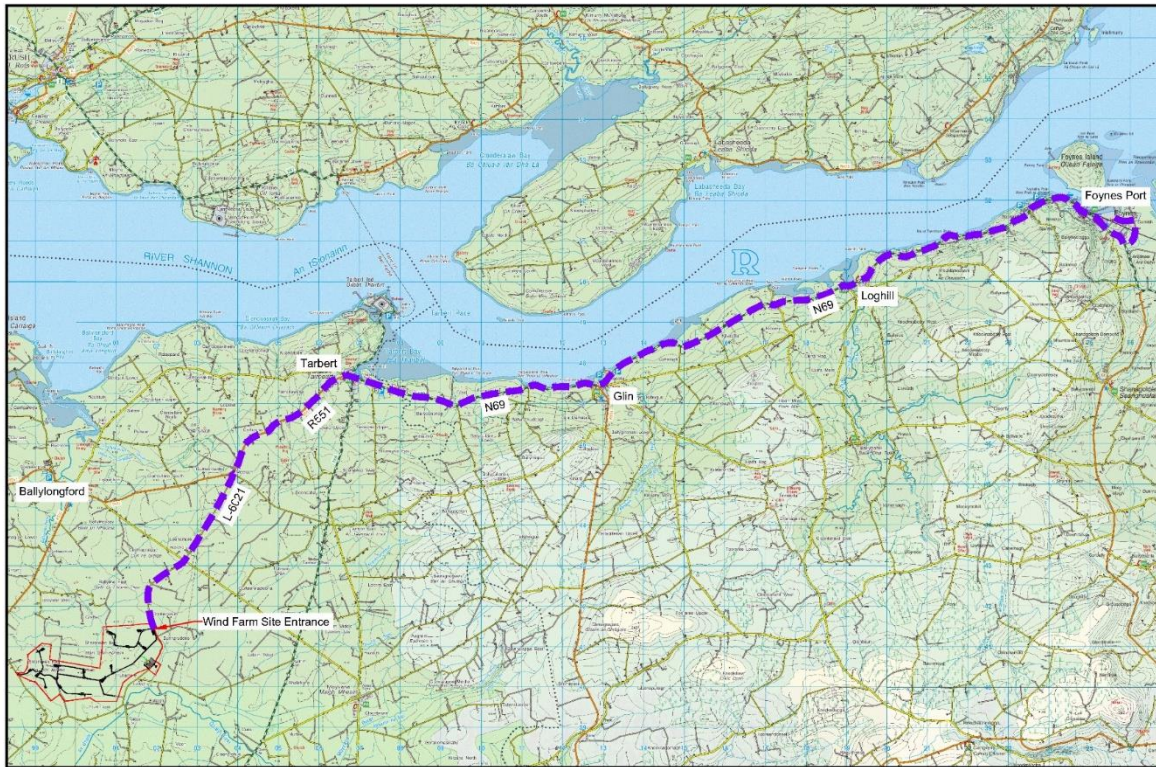


Figure 15-3: Proposed Turbine Delivery Route

15.2.1.3 Existing Traffic Volumes and Road Capacity

Existing baseline traffic volumes have been determined on the basis of a review of traffic volumes for previous planning applications to Kerry County Council in the area (Ref. Leanamore Wind Farm and TII’s automatic traffic counter data, as outlined in **Volume 3, Appendix 15-1 Traffic and Transportation Assessment**). The 2019 typical baseline traffic volumes are provided in **Table 15-2**. The volumes of peak Heavy Goods Vehicles (HGV) and the proportions of Annual Average Daily Traffic (AADT) HGV’s are also provided.

Table 15-2: Existing Traffic Volumes

Road Location	Total Vehicles (HGVs)	
	2019 Peak Hour (HGVs)	2019 AADT (% HGVs)
N69 between Listowel/Tarbert	451 (14)	4,119 (3.5%)
N69 between Tarbert/Foynes	435 (17)	3,468 (5.3%)
R551 between Ballylongford/Tarbert	172 (8)	1,823 (4.4%)
R552 between Listowel/Ballylongford	121 (5)	1,282 (3.6%)
L1021 between R551/N69	17 (1)	180 (1.7%)
L6021 between Site/L1021	11 (0)	117 (1.7%)
L1012 between R551/N69	27 (1)	286 (1.4%)
L1009 between R552/Site	7 (0)	74 (1.4%)

The road network capacities based on existing traffic volumes were also examined. This concluded that the regional and local roads surrounding the proposed development are operating within their respective rural road link capacities as are the roads in the nearest urban centres – Ballylongford,

Tarbert and Listowel. Further details are provided in **Volume 3, Appendix 15-1 Traffic and Transportation Assessment**.

15.2.2 Built Services

15.2.2.1 Electricity Supply and Infrastructure

Existing electricity infrastructure in the vicinity of the proposed development site includes the 110kV Kilpaddoge to Tarbert overhead line, as shown in **Figure 15-4**.

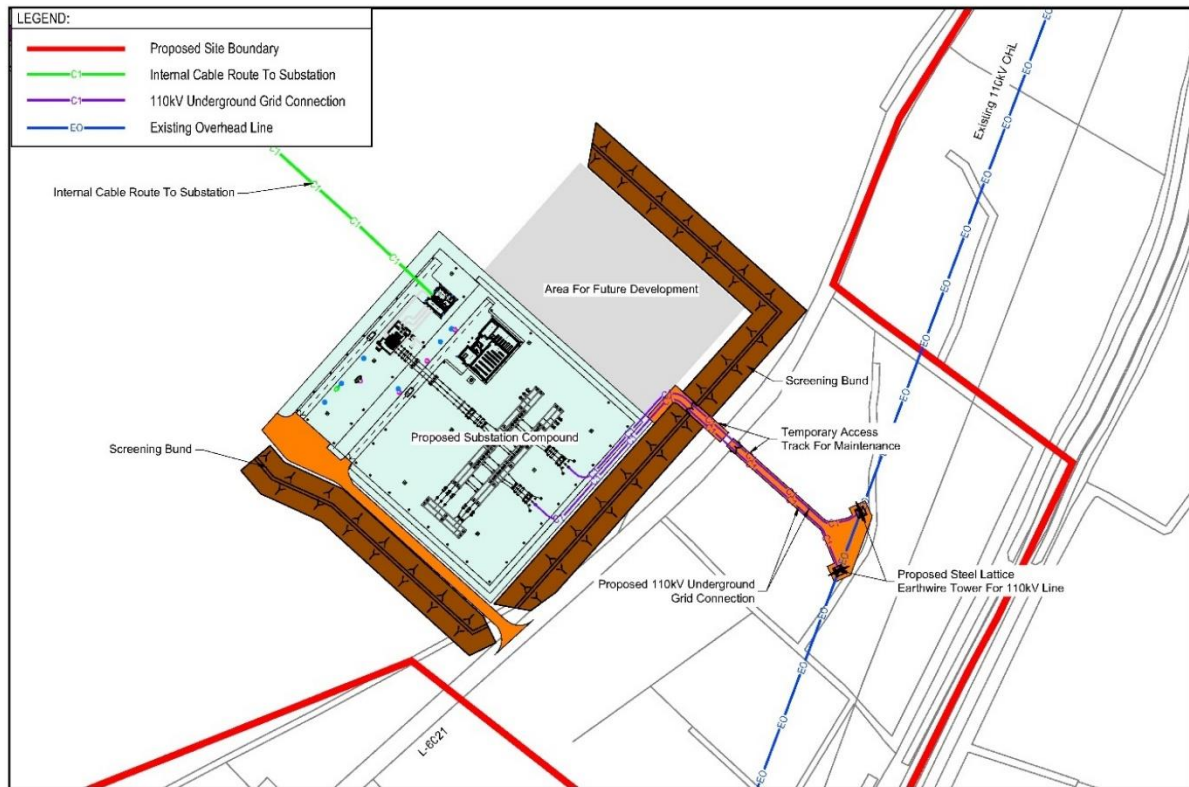


Figure 15-4: Existing 110kV Overhead Electricity Infrastructure

A solar farm development (Tullamore Solar Farm), which has received planning permission from An Bord Pleanála (Planning Ref. PL08 .302681), will be located circa 1.5km south of the proposed wind farm. This development will consist of 357,500m² of solar panels which will be connected to the 110kV overhead line via an on-site substation. Refer to **Figure 15-5**.

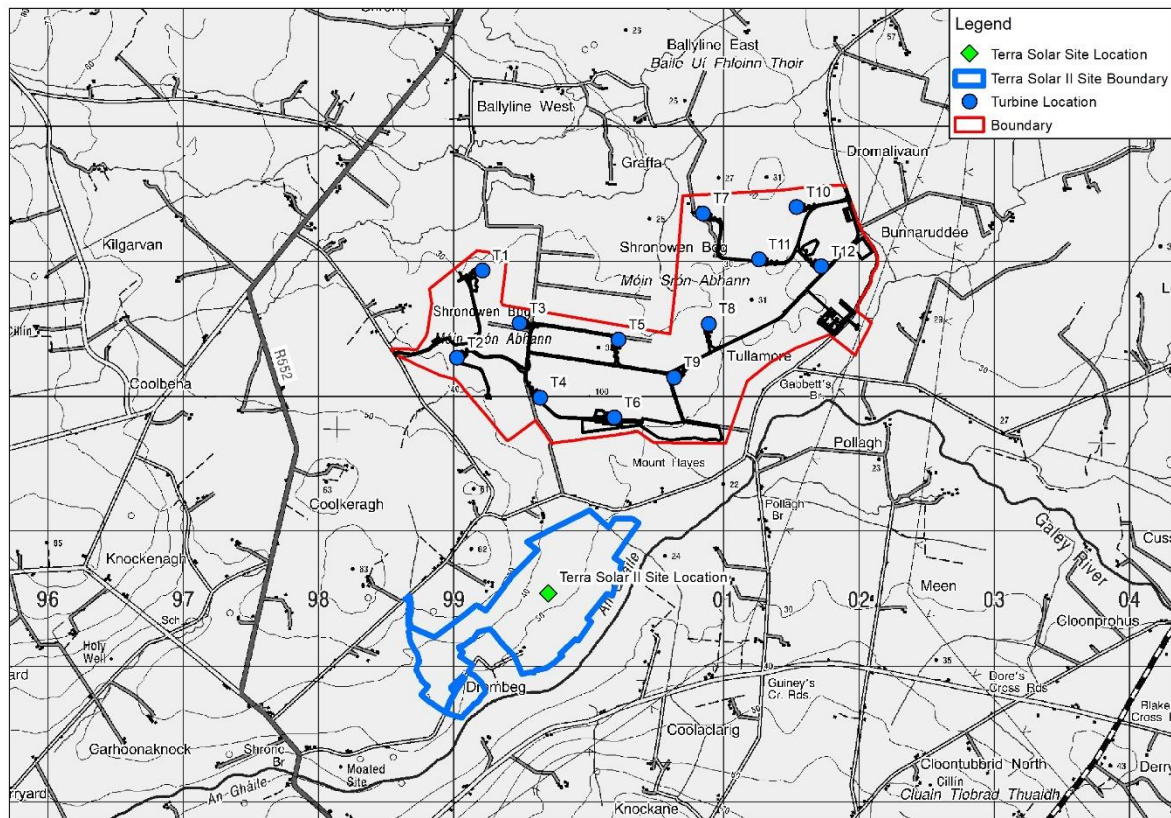


Figure 15-5: Permitted Solar Farm Location to south of Proposed Wind Farm

15.2.2.2 Telecommunications

Field and desktop surveys were undertaken 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 by the proposed wind farm.

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. TV transmitter locations in proximity to the proposed development are shown in **Figure 15-6**. House locations in proximity to the proposed development receive transmission from Cnoc an Oir transmitter circa 10km west of the development.

Saorview coverage is also illustrated in **Figure 15-6**. The map shows that the proposed development is within an area of good coverage, indicated by the green shading. Areas where coverage is 'challenging' are not shaded, including some house locations in Listowel to the south of the development, Duagh to the southwest and Athea.

A review of the Commission for Communications Regulation (ComReg) site map shows that mobile network operators with masts and communication links in the area include Meteor, Vodafone, Eir, Imagine Communications Ireland Ltd. and Three, see **Figure 15-7**.

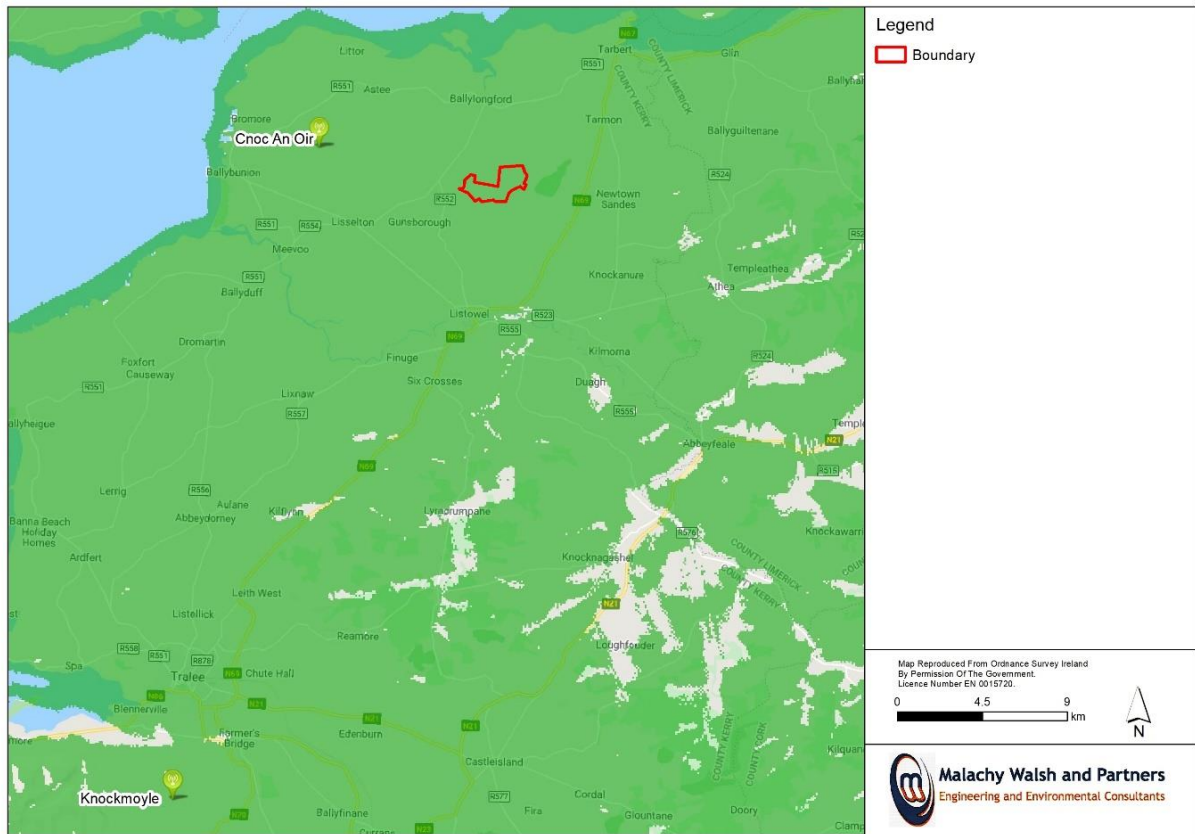


Figure 15-6: TV Transmitter Locations and Saorview Coverage

(Source: <https://www.saorview.ie/en/get/coverage>)

Areas of green shading indicate 'good' coverage.

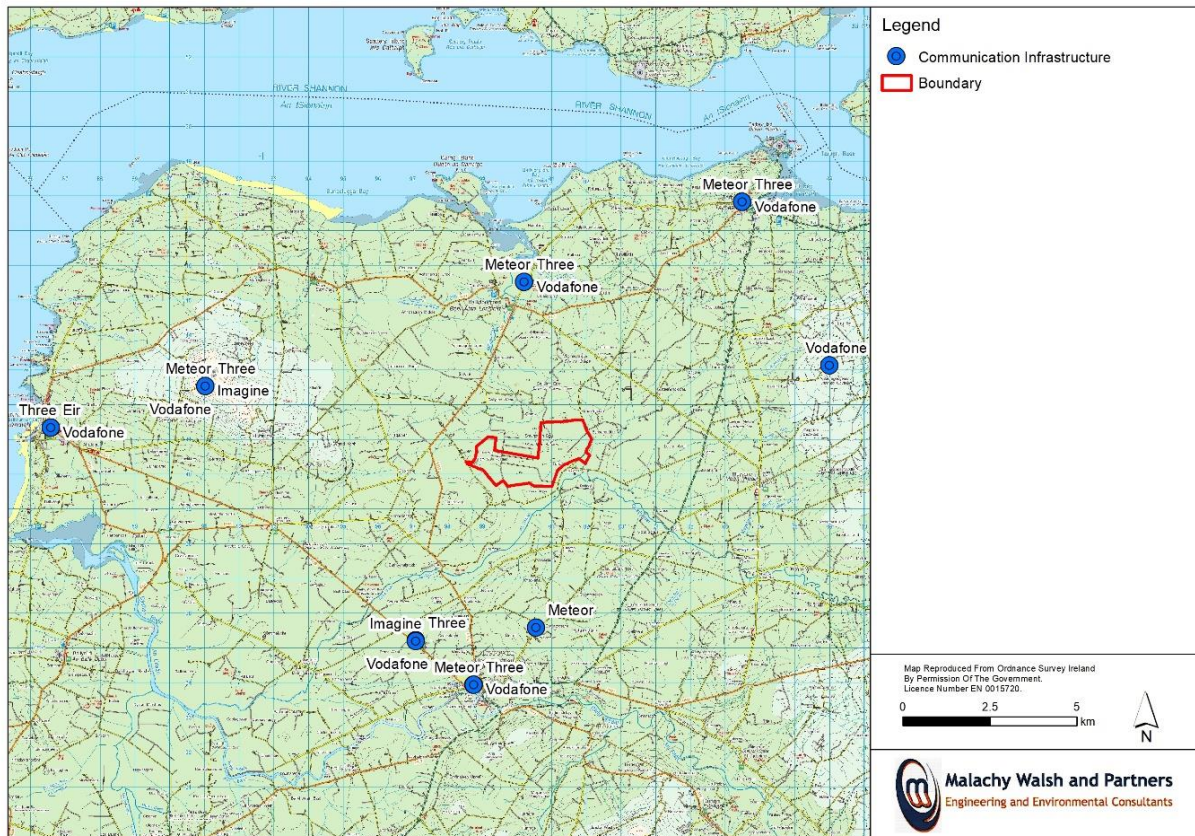


Figure 15-7: Locations of Telecommunications Infrastructure

(Source: <https://siteviewer.comreg.ie/#explore>)

The responses from telecoms operators are summarised in **Table 15-3**. Of the eighteen (18) telecom operators consulted, twelve (12) had no issues with the proposed development and five (5) did not respond. Both Ivertec and Vodafone queried the potential for interference with signals associated with their infrastructure, however further investigation by MWP and the Applicant, concluded that the concerns were unfounded.

Table 15-3: Telecoms Consultation Responses

Consultee	Response	Comment
AI Bridges	09-11-2020	No issues raised
Eircom	02-11-2020	No issues raised
Electricity Supply Board	No response	
Enet Telecommunications Networks	03-11-2020	No issues raised
EOBO	No response	
Imagine Networks Services	05-11-2020	No issues raised
Ivertec	03-11-2020	Potential issue identified – requested analysis.
Meteor Mobile Communications	02-11-2020	No issues raised
MP&E Trading Company	11-11-2020	No issues raised
PermaNET	No response	No issues raised
Raidio Ciarrai Teoranta	No response	
Three Ireland (Hutchison)	03-11-2020	No issues raised
Viatel Ireland	No response	
Virgin Media Ireland	02-11-2020	No issues raised
Vodafone Ireland	12-11-2020	Potential issue with location of T2 – requested analysis.
RTÉ/Saorview	29-10-2020	No issues raised
BAI	02-11-2020	No issues raised
RTE Transmission Network Ltd	29-10-2020	No issues raised

15.2.2.3 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.

There is one aviation centre within 20km of the proposed development; Abbeyfeale Airfield to the southeast; and four within 50km including Shannon Airport to the northwest, Ardferit Airfield to the southwest and Kerry Airport to the south as shown in **Figure 15-8**.

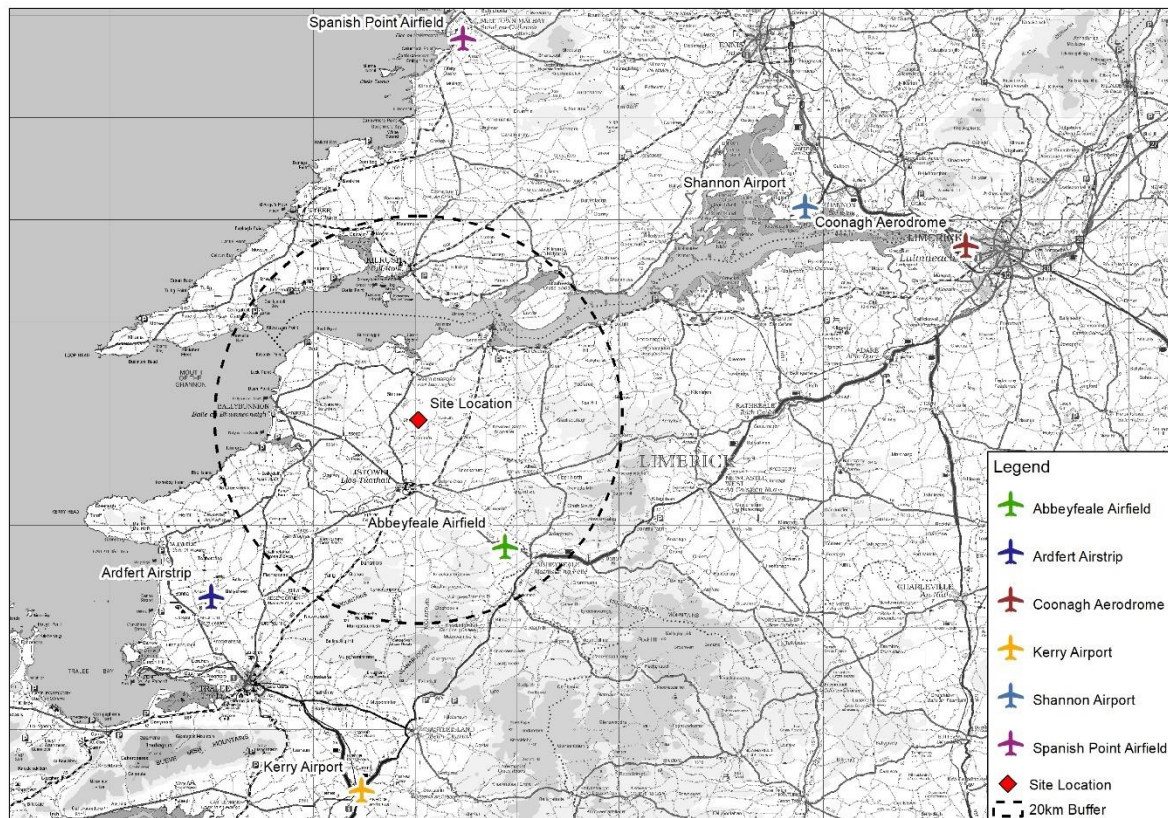


Figure 15-8: Airport/Airfield Locations in the Region

15.2.2.4 Water and Wastewater Infrastructure

The proposed site is currently greenfield and there is currently no wastewater or water supply infrastructure within the site. The alternative proposed grid connections route includes an underground cable route on the Local Road L6021 to the south and east of the site. Excavation of trenching for the cable route may impact on any existing group water scheme pipelines, however their locations will be identified prior to construction in consultation with Kerry Co. Council Water Services and Irish Water.

15.2.3 Waste Management

The proposed site is greenfield and there is currently no solid or liquid waste within the site. The construction of the proposed development will result in the removal of soil, subsoil, peat and bedrock in parts of the site in order to facilitate the construction of the new access roads, turbine bases, crane hardstand areas, substation, cable trenches, permanent met mast and all other associated infrastructure. The total volume of excavated material for the proposed development is approximately 146,700m³ of which peat accounts for approximately 131,200m³. Excavated materials, other than peat, will be re-used on the site for landscaping, drainage berms and can be used to backfill turbine foundations as appropriate. The locations of the proposed 6 no. peat storage areas and peat deposition areas are shown as discussed in **Volume 2, Chapter 9 Land and Soils**.

15.2.4 Forestry Resources

The proposed development site largely comprises cutover bog surrounded by agricultural grassland with smaller expanses of commercial coniferous forestry around the boundary of the site. Forestry is not however dominant on the site or in the wider area. To facilitate the construction of the turbine

foundations, hardstands, access tracks and turbine assembly at turbine locations T1 and T7, permanent felling of a small area of forestry (ca. 3.15ha) is required, as shown on **Figure 15.9**.



Figure 15-9: Areas to be Felled (excerpt from Planning Drawing 19876-MWP-00-00-DR-C-P01-5019)

Further details are provided in **Chapter 2 Project Description** and **Chapter 6 Biodiversity**.

15.3 LIKELY SIGNIFICANT EFFECTS

15.3.1 Roads and Traffic

A detailed assessment of the impact of the proposed development on traffic and the road network is provided in **Volume 3, Appendix 15-1 Traffic and Transportation Assessment**.

15.3.1.1 Construction Phase

As outlined in the **Traffic and Transportation Assessment** for the project, subject to receiving planning permission, it is envisaged that work would commence at the site once the relevant permits and funding are in place in 2022, with duration of approximately 18 months. Accordingly, the proposed development is scheduled to be fully complete and operational by 2024. Peak construction would occur during eight months of the 18 months construction programme, in 2023.

15.3.1.1.1 Site Access and Traffic

As outlined in Section 15.2.1.2, access to the site will be provided using two entrances. The main site entrance during both the construction and operational phases will be from the L6021 on the north eastern side of the site, with a second entrance from the L1009 on the western side for construction only. Turbine components will be delivered via the north eastern entrance. The construction materials' delivery vehicle routes are likely to include the R552, R557, R555, R553, R523 Regional Roads and L6021 and L1009 Local Roads, as shown on **Figure 15-10**.

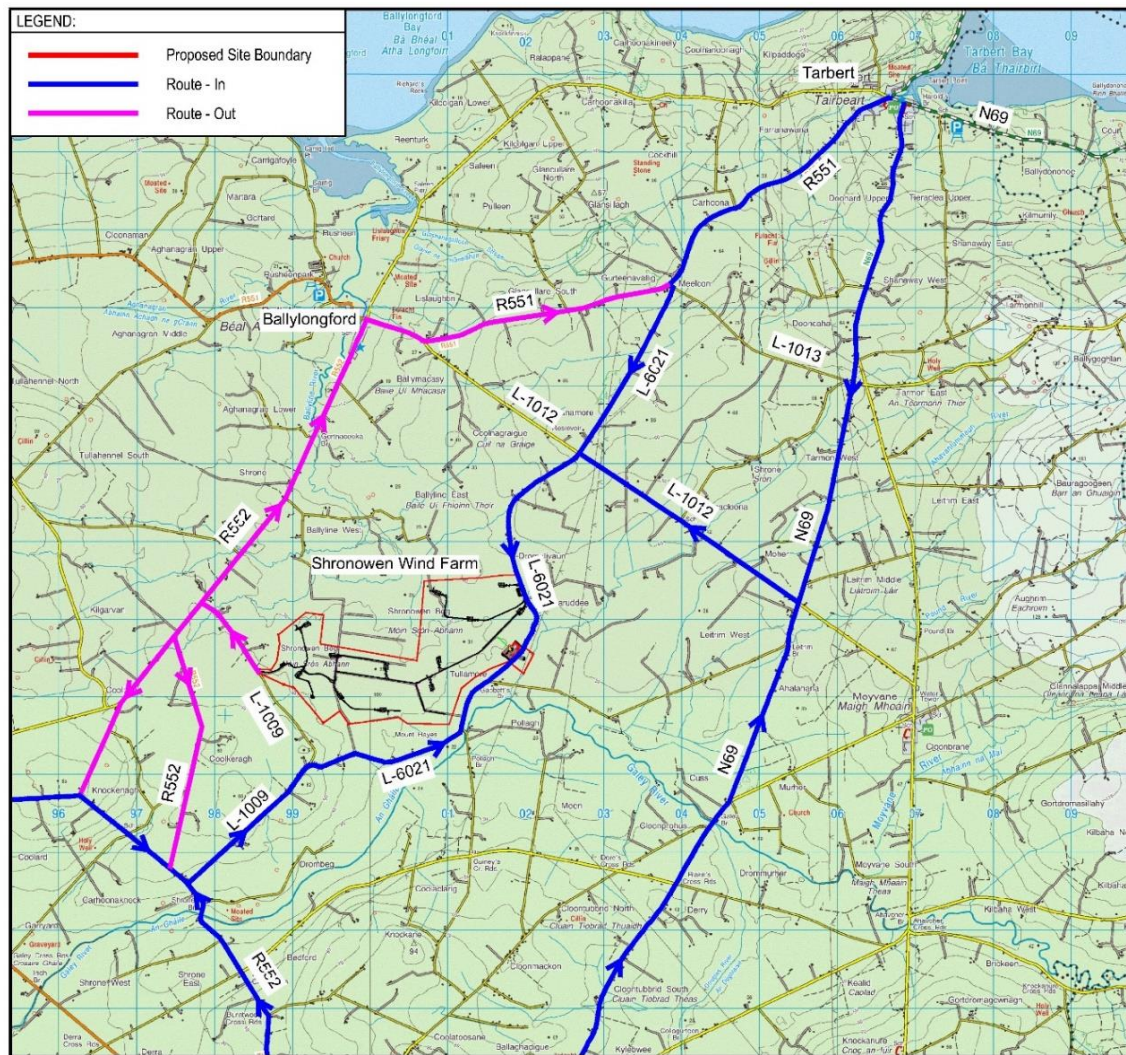


Figure 15-10: Proposed Construction Materials Delivery Routes

The proposed site entrances will be in line with TII Rural Road Link Design DN-GEO-03031 (June 2017) and TII Geometric Design of Junctions DN-GEO-03030 (April 2017), ensuring that the visibility requirements are adhered to. Simple priority junctions will be provided.

Construction of the proposed wind farm will result in an increase in traffic on the L1009 and L6021. In addition, access will be required for the proposed substation compound via a proposed new access point from the L6021 Local road. The 18 months construction programme will require the importation of up to 30,507 loads of construction materials. This will include delivery vehicles for the 12 wind turbines including their abnormal loads. All other construction materials will be imported using standard heavy vehicle delivery trucks with capacities of 10 m³ and 20 tonnes. Concrete will be imported using 8 m³ capacity trucks. Peak heavy vehicle traffic volumes generated by the delivery of construction materials will be up to 158 heavy vehicles per day, both to and from the site. Highest peak hour heavy vehicle traffic volumes will be up to 13 heavy vehicles, both to and from the site.

It is proposed to source imported stone and capping aggregate from local quarries in the area. There are currently a number of licensed facilities in the surrounding area including Ardfert Quarry Products located circa 26km southwest of the development in Sackville, Ardfert, O'Mahoney Quarries located circa 24km southwest in Ballintobeenig, Tralee, P. Galwey quarries located circa 26km south of the

development in Fahaduff and William McAuliffe Ltd. Sand and Gravel located circa 40km east-southeast in Kilmeeady, Co. Limerick.

Site personnel will travel to site prior to 7.00 a.m. and depart from site from 7.00 p.m., on weekdays, outside the peak traffic hours. The expected peak staff will be up to 60 personnel, who will generate approximately 60 car and van trips, both to and from the site each working day, on the basis of an average worst case vehicle occupancy rate of one (1) person per vehicle. Canteen facilities for personnel will be provided on-site, therefore there are no requirements for staff to leave site during the working day.

The wind turbine loads will be delivered in consultation with Kerry County Council and An Garda Síochána, during off-peak traffic periods. A total of 120 delivery vehicles will be required for the 12 turbines, which have been included in the number of HGV deliveries. This could result in temporary delays for other location traffic during the off-peak traffic delivery periods.

Based on the anticipated traffic volumes and existing road capacities, the **Traffic and Transportation Assessment** concluded that the N69 and R551 would continue to operate within their TII rural road link AADT capacities, for the predicted peak construction year 2023 peak daily volumes and the TII central growth scenario. The TII guidance does not provide rural road link capacities for rural roads with typical road carriageway widths of less than 6m. The R552, with a typical rural road carriageway width of 5.3 metres, the L1012, with a typical road carriageway width of 5.1m, and the L1021, with a typical road carriageway width of 5m, have estimated rural road link capacities that equate to the majority proportion of the 5,000 vehicles AADT capacity identified by TII for a 6m-wide carriageway. Accordingly, the R552, L1012 and L1021 would continue to operate well within their estimated rural road AADT link capacities, based on their predicted 2023 peak daily volumes with peak construction and the TII central growth scenario. The AADT volumes on other local roads would remain relatively low, and within estimated rural road AADT link capacities, subject to the provision of local road carriageway widening, in consultation with Kerry County Council, including along the L6021 and L1009.

15.3.1.2 Traffic Management

A Traffic Management Plan (TMP) has been prepared for the proposed development to manage the estimated additional traffic that will be generated, mainly during the construction. Refer to **Volume 3, Appendix 15-2 Preliminary Traffic Management Plan (TMP)**.

The key management measures to be implemented are as follows:

- Construction activities associated with the proposed development will adapt working practices to ensure the safety and convenience of all road users during the construction of the development, including pedestrians, cyclists and other traffic.
- The appointed contractor shall properly plan and manage the project to ensure that any works within the road network do not result in a safety hazard to road users or the workforce involved in the project and; any resulting increase in traffic delays and congestion are minimised.
- Construction traffic will be limited to an appropriate speed limit to be set by the appointed contractor along local roads. A construction traffic safety and courtesy protocol will be implemented to manage the traffic for delivery of materials. A traffic coordinator will be

employed full time during this construction period to implement speed limitations and construction traffic safety and courtesy protocol.

- The appointed contractor will liaise with An Garda Síochána and Kerry County Council in the event of other planned construction projects in the area. The appointed contractor will recognise that other external factors such as severe weather events can affect traffic flow close to the project and will endeavour to minimise the effect of the works on traffic in the planning and programming of the works at construction stage.
- In order to reduce two-way construction vehicle movements on local roads, it is proposed that all general construction delivery vehicles enter the wind farm site via the eastern entrance on the L6021 and exit the site via the western entrance on the L1009.
- It is proposed to allow routine deliveries such as aggregate access the site between 8.00am and 8.30am. The initial early morning delivery trucks will exit the wind farm site empty with the run of traffic but they will be prohibited from delivering again until 10am.
- A wheel wash facility will be installed on the exits of the wind farm site and a road sweeper will operate on the L-1009 and L-6021 Local roads on a full-time basis for the duration of the importation of aggregates and concrete and at regular intervals for the duration of the project. A water bowser will be employed to spray the local roads with water during dry periods when there is a risk of dust nuisance.
- Appropriate signage will be maintained for the duration of the project with clear warning signage at all site entrances along the L-1009 and L-6021 Local roads.
- Pre-construction and post-construction surveys will be carried out to verify the structural integrity of the proposed turbine delivery route road network. Repairs will be carried out on the public roads as necessary during the construction phase to ensure that the condition does not deteriorate below an acceptable standard. Following completion of construction, the condition of the public road will be of at least the same standard as it was prior to commencement of construction.
- The Applicant is committed to providing a high level of communication with the relevant local authorities and to the general public and business community regarding the extent and duration of the project. The appointed contractor will co-operate with the developer in this regard. Such communications shall include:
 - Submissions of proposed traffic management measures;
 - Updates to construction programming.
- The appointed contractor shall also ensure that the local community is informed of any proposed traffic management measures in advance of their implementation. Such information shall be disseminated by posting advertisements in local newspapers or by delivering leaflets to nearby houses. Such information shall contain contact information for members of the public to obtain additional information and to provide knowledge such as on local events, sports fixtures etc. which may conflict with any proposed traffic management measures.

The Preliminary Traffic Management Plan is for planning purposes only and a Final Traffic Management Plan will be produced at construction stage by the appointed contractor pending final selection of the grid connection option.

15.3.1.3 Turbine Delivery Route

The proposed Turbine Delivery Route (TDR) has been assessed using an AutoTrack model which was developed for a 68m long blade with a 12m overhang on a bogie trailer in accessing the route from

Foynes Port to the proposed site. Pinch points along the route were identified using aerial photography, topographical survey information where available and site visits as discussed in **EIAR Volume 3 Appendix 3-1**.

Along the TDR, nodes/ pinch points have been identified where temporary works will be required to facilitate vehicle access. Works will be limited to minor temporary disturbances, such as removal of fences, lighting poles, telecoms poles, signs and other street furniture. Temporary removal of telecom poles, electrical poles, overhead cables, fences as discussed above will be limited to approximately one day. Electrical works will be completed with minor temporary disruptions to local electricity supply. Fences, signs and other street furniture will be replaced on same day of completing works. The effects of works along the TDR are considered to be short term and not significant.

15.3.1.4 Operational Phase

As outlined in the **Traffic and Transport Assessment**, during the operational phase there will be periodic maintenance on site. This will generate a relatively low volume of vehicles, including occasional heavy goods vehicles. The proposed operational phase will have imperceptible to not-significant traffic effects.

15.3.1.5 Decommissioning Phase

As outlined in the **Traffic and Transport Assessment**, the removal of the wind turbines during any decommissioning phase would be similar in nature to the erection process. In both cases the same scale and size of crane would be required to dismantle the blades, nacelle and tower components. Once the turbines are dismantled, they will then need to be transported off site by truck. That process will be subject to an abnormal load permit and traffic management plan to be agreed with the Local Authority and An Garda Siochana. Accordingly, the traffic impact would be the same in nature and duration.

15.3.2 Built Services

15.3.2.1 Electricity Supply and Infrastructure

To facilitate a connection to the National Electricity Grid (NEG) for the twelve (12) No. turbines, it is proposed that the wind farm's underground cables would be connected to a new 110kV substation within the site, which would in turn connect with the NEG via an underground cable connection to the existing Tralee to Tarbert 110kV overhead line. This will require the installation of two new lattice towers within the existing overhead line. The proposed grid connection location has been chosen to best integrate with the existing electrical infrastructure and is relatively short at c. 225m length.

An alternative option for connection has been assessed in this EIAR. This would consist of a 5.5km underground cable along the L6021 local road to the previously granted Tullamore Solar Farm due south of the wind farm site (KCC Planning Ref 18/720 and ABP Ref. PL.08.302681).

The proposed development does not pose a negative risk to the local electricity infrastructure. There is currently sufficient capacity and infrastructure in place to accommodate the additional renewable energy to be generated. The proposed development will result in an enhancement of the local electricity infrastructure and assist in meeting increases in electricity demand nationally by exporting electricity to the grid. Therefore, the effects on grid capacity and electrical infrastructure are considered to be long-term and positive.

15.3.2.2 Aviation

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. The proposed development is located within an area characterised by operational wind farms. It is not within any flight paths, therefore the effects on aviation are considered not significant. There will be no impact on aviation radar or aviation telecommunications from the wind farm development.

Consultation with Irish Aviation Authority (IAA) was undertaken. The IAA's responded stating that their policy is to evaluate the development following submission of the planning application and EIAR. The Any mitigation measures are to be agreed prior to construction should development be permitted.

15.3.2.3 Television and Telecommunications

Radio, television and microwave transmissions can potentially be affected by either individual wind turbines or wind farm developments as follows:

- The steel turbine tower may obstruct, reflect or refract the electromagnetic waves used in telecommunications systems for transmission purposes;
- The turbine blades may have a similar intermittent effect as they rotate;
- If the blades are either of steel construction or have a steel core they can act as an aerial to relay the signal.

The relatively recent switch over to digital terrestrial television (Saorview) has significantly reduced potential impacts on television signals associated with wind farm development.

As shown on **Figure 15-6**, Saorview service coverage is currently a challenge in some areas south and southeast of the development site. Correspondence from Broadcasting Authority of Ireland (BAI) has indicated that they are not aware of any issues from existing wind farms with existing Frequency Modulation (FM) networks. Furthermore, the proposed development is not located close to any existing or planned FM transmission sites. It is unlikely therefore, given that the proposed wind farm is not located close to any existing or planned FM transmission sites, that receptors in the vicinity of the wind farm could experience interference with television reception. Notwithstanding this, as is standard practice, a signed Protocol between the developer and RTE will be put in place, in which the developer will be responsible for resolving any issue of interference with television reception as a result of the proposed development.

Consultation with telecom operators was also undertaken to assist in identifying network infrastructure that could be impacted by the proposed wind farm. Of the operators who responded, most confirmed that the proposed development will not affect the existing network. Ivertec and Vodafone queried the potential for interference with signals associated with their infrastructure, however further investigation by MWP and the Applicant, concluded that the concerns were unfounded.

It is anticipated that any potential interference with links, should they arise, can be suitably overcome. Therefore, effects on telecommunication assets are not considered to be significant. Suitable mitigation, if required, would need to be carried out in consultation with the operations provider.

15.3.2.4 Water and Wastewater Infrastructure

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

Water needs for construction activities will be low and limited to truck washing, wheel wash, dust suppression and sanitary facilities for a temporary period of time. It is proposed that this water requirement will be sourced from on-site rainwater collection systems and settlement ponds. It is estimated that up to approximately 3,000 litres per day of potable water will be required during peak construction for construction employees. It is proposed that this water requirement will be imported in bulk water tanks. Potable water during the operational and maintenance phase is estimated to be approximately 50 litres per day. This water will be supplied as bottled water. The volumes of water required are minimal and will have a negligible impact on the water supply utilities.

During the construction time period, sanitary wastewater, estimated to be 3,000 litres per day, will be collected in portable toilets during construction. Disposal of sanitary wastes will be managed through a contract with a licensed waste contractor. There are 4 no. of licensed facilities within 50km of the proposed development. These are likely to include but are not limited to Shannon Wastewater Treatment Plant 49km northwest, Croagh Wastewater Treatment Plant 43km west, Tarbert Wastewater Treatment Plant 11km northwest and Ballylongford Wastewater Treatment Plant 4km north and other wastewater facilities in the surrounding area. During the operational phase, wastewater from welfare facilities on site will drain to integrated wastewater holding tanks associated with the toilet units. The stored effluent will then be collected on a regular basis from site by a permitted waste contractor and removed to a licensed waste facility for treatment and disposal. The volumes of wastewater requiring disposal are minimal and will have a negligible impact on the capacities of external treatment facilities. Therefore, the effects on water and wastewater infrastructure are considered to be Imperceptible.

15.3.3 Waste Management

During the course of the project, a certain amount of waste will be produced, mainly during the construction phase. **Table 15-4** below outlines the anticipated types of major waste streams that will be generated by the project.

Table 15-4: Anticipated waste arisings on site

Waste item
Domestic waste from Welfare Facilities
Waste Chemicals, Fuel and Oils
Packaging
Concrete
Waste Metals
Excavated Materials

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

- (a) Prevention;
- (b) Re-use;
- (c) Recycling;
- (d) Other Recovery (including energy recovery); and
- (e) Disposal.

Waste generation is principally avoided through planning and management of activities and good housekeeping. The procurement of material inputs are generally in bulk. By bulk procurement, the generation of small-sized containers and packaging is largely avoided and thus minimises the generation of unnecessary waste requiring recycling or disposal.

In line with the waste hierarchy, wherever possible, packaging will be returned to the supplier 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.

15.3.3.1 Construction Phase

Construction phase waste may consist of hardcore, concrete, spare steel reinforcement, cable wires, shuttering timber and building materials. This waste will be stored in the construction compound and collected at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best practice procedures at an approved facility. Plastic waste will be taken for recycling by an approved contractor and disposed of 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 compounds and disposed of at a licensed landfill facility.

Any surplus spoil generated through the construction of the access roads, crane hardstands, turbine foundations and substation compound will be managed within the site and will not be disposed of offsite. Material will be transported to designated peat/spoil deposition areas via articulated dumper trucks or tractor and trailer as outlined in **Chapter 3 Civil Engineering**.

15.3.3.2 Operational Phase

During the operational phase, minimal amounts of solid waste will be generated, which will be collected onsite and transported to a licensed disposal (potential facilities are listed in **Table 15-5**), or recycling facility by a waste hauling contractor. Hazardous materials, such as gear and hydraulic oils used in the operation of the wind turbines and mineral oils used in transformers, will be disposed of in accordance with all applicable legislation.

Table 15-5: Licensed Waste Facilities

Waste Type	EWC	Facility	Location
Excavated Material (not suitable for on-site reuse)	17 03 01 17 03 02	K Fahy Waste Facility Ltd	Fahy Environmental, Dromard, Rathkeale, Co. Limerick. V94 H9XE
		Roadstone Limited	Ballygarvan Sandstone Quarry, Killanully, Ballygarvan, Co. Cork T12 AX80
		Roadstone Ltd.	Bunratty, Co. Clare V95 D735
		K Fahy Waste Facility Ltd	Fahy Environmental, Dromard, Rathkeale, Co. Limerick
Domestic Wastewater	20 03 04	Cremins Farm Compost Ltd	Coolaleen, Broadford, Co. Limerick P56 FP80
		OD Agri Ltd	Ballyboe, Ballypatrick, Clonmel Co. Tipperary
		Clare Drains Environmental Ltd	Unit 10 Abbey Business Park, Quin Road Business Park, Quin Road, Ennis, Co. Clare
		Shannon Wastewater Treatment Plant	Shannon, Co. Clare
		Croagh Wastewater Treatment Plant	Adamswood, Croagh, Co. Limerick
		Tarbert Wastewater Treatment Plant	Ballyculhane, Co. Kerry
		Ballylongford Wastewater	Quay St, Lislaughtin, Ballylongford, Co. Kerry
C&D waste	17 01 07	Roadstone Limited	Ballygarvan Sandstone Quarry Killanully Ballygarvan Co. Cork T12 AX80
		Roadstone Ltd.	Bunratty, Co. Clare V95 D735
		Donal Murphy	Caher & Connagh, Ballineen, Co. Cork P47 DP30
		Higgins Waste & Recycling Services Ltd.	Clogherclemin, Tralee Co. Kerry
Waste oils	13 02 08	K Fahy Waste Facility Ltd	Fahy Environmental, Dromard, Rathkeale, Co. Limerick
		Kerry ELV Centre Ltd	Rangue, Killorglin, Co. Kerry V93 PW74
		Thomas Relihan	Clounafineela, Kilflynn, Tralee, Co. Kerry V92 R295
Domestic waste	20 03 01	Emerald Waste Company Limited	Mallow, Co. Cork P51 DT91
		Starrus Property Holdings Ltd	Sarsfield Court Industrial Estate, Glanmire, Co. Cork T45 R585
		K Fahy Waste Facility Ltd	Fahy Environmental, Dromard, Rathkeale, Co. Limerick
Oil interceptors	13 05 01 13 05 02 13 05 03 13 05 06 13 05 08	Clare Drains Environmental Ltd	Unit 10 Abbey Business Park, Quin Road Business Park, Quin Road, Ennis, Co. Clare
		KPA (Ballinalack Limited)	Ballinalack, Co Westmeath N91 ATY0
		K Fahy Waste Facility Ltd	Fahy Environmental, Dromard, Rathkeale, Co. Limerick
		John Conaty Limited	Kells Co. Meath

The types of wastes to be generated will be similar to established construction waste streams and will not require unusual or new treatment options. Waste volumes will not be so significant as to require new permitted treatment, storage and disposal facilities as there is sufficient capacity at licensed disposal or recycling facilities in proximity to the proposed development. Waste Management procedures have been included in the Construction Environmental Management Plan (CEMP) in **EIAR Volume 3 Appendix 2-1**.

15.3.3.3 Decommissioning Phase

On decommissioning, about 85% of turbine components, including steel, copper wire, electronics and gearing, can be recycled or reused. The fibreglass blades however are difficult to recycle and currently are generally disposed of by landfill. There are existing options available to developers for blade reuse and recycling in the form of artificial reefs, playgrounds or street furniture, cement co-processing for the glass fibre component, and blade recycling through pyrolysis and gasification (Wind Europe, Discussion Paper on Managing Composite Blade Waste, 2017).

This would be a moderate negative impact of the development and likely to require provision of new treatment technologies and/or facilities. Therefore, the effects of waste management are considered to be Moderate-Negative.

15.3.4 Forestry Resources

To facilitate the construction of the turbine foundations, hardstands, access tracks and turbine assembly at turbine locations T1 and T7, permanent felling of a small area of forestry (ca. 3.15ha) is required, as shown on **Figure 15.10**.

All tree felling will be undertaken in accordance with a tree felling licence, using good working practices as outlined by the Department of Agriculture, Food and the Marine (DAFM) Standards for Felling and Reforestation (2019). These standards deal with sensitive areas, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. All conditions associated with a proposed felling licence will be complied with. All excess trees, brash and minor branch residues will be gathered and removed from the site. It is proposed to fell a distance of 93m, (in line with the required clearance for bats) around turbines.

To compensate for forestry felled, replacement forestry will be planted in lands to the northwest of the proposed development site adjacent to T7, as shown on **Figure 15-11**. These lands, or similarly approved lands, will be used for replanting should the proposed development receive planning permission. Replanting requirements will be discussed and agreed with the Forest Service.

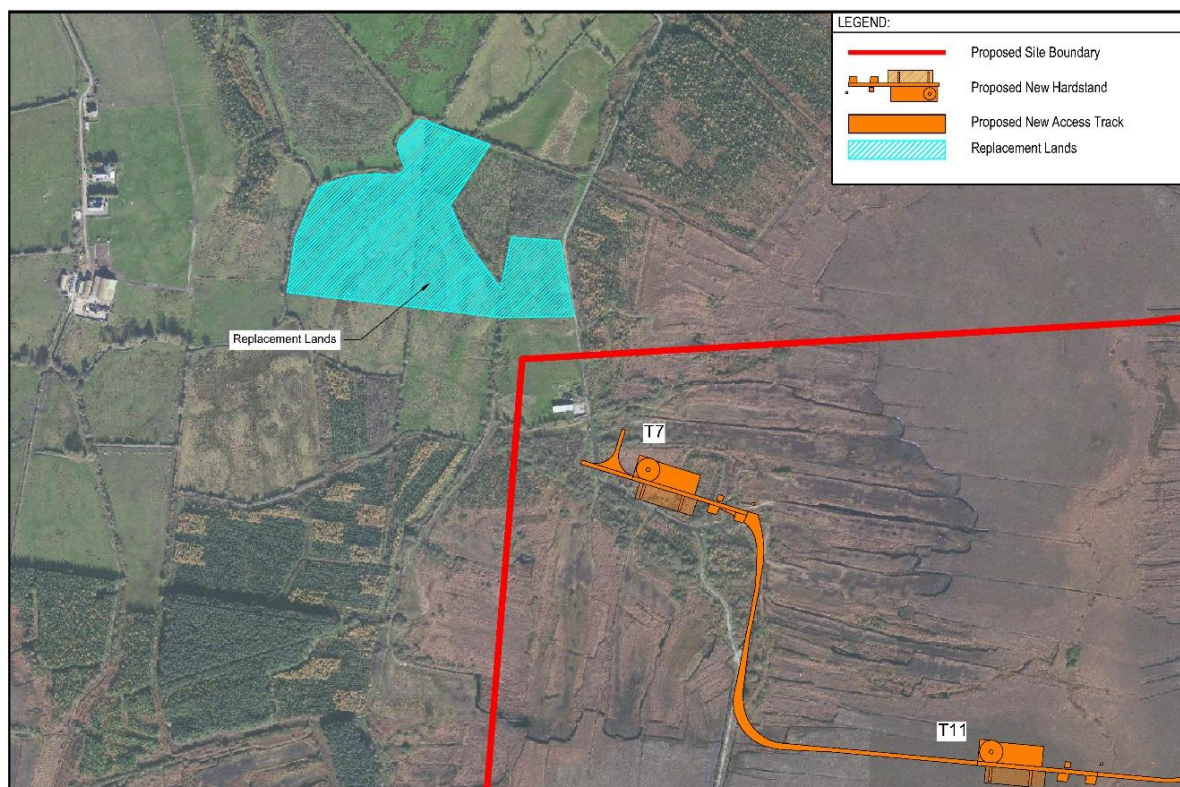


Figure 15-11: Forestry Replanting Site

Based on the above, it is concluded that the forestry loss within the site will be insignificant relative to the size of the forestry resource nationally, regionally and locally. As replanting will be required for the equivalent area felled and a replanting area has been identified, there will be no net loss of forestry.

Once mitigation measures have been implemented (outlined below in Section 15.4), namely the replanting of felled forestry on a replacement site and adherence to Forest Service requirements for felling and replanting, there will be no significant impact on forestry.

15.3.5 Cumulative Effects

The cumulative effects of the proposed development have been assessed with existing and permitted developments in the surrounding area. Much of the surrounding area accommodates residential dwelling, agricultural buildings and neighbouring wind farm developments. The overall impact is considered to be low with regards to traffic volumes and road capacities. The effects on roads traffic are considered not significant.

As discussed in **Chapter 11 Noise**, planning permission has been granted for a solar PV farm at Tullamore, Drombeg and Coolkeragh, Listowel Co Kerry (ABP ref ABP-302681-18). It is approximately 1.5 km south of the proposed wind farm. The solar panels do not produce any noise and little operational maintenance is required on an ongoing basis. There will therefore be no operational cumulative impact from this permitted development. A 100kV substation will form part of the solar development infrastructure but it is subject to a separate planning application. The substation is currently the subject of a section 182E preapplication consultation request to An Bord Pleanála. It is

reasonable to assume that this development will secure planning permission. It is understood that the proposed substation location is at least 400m from the nearest dwelling. At such separation distances, the proposed solar farm substation is unlikely to be perceptible, therefore there can be no cumulative impact with the wind farm.

To facilitate construction of the proposed development, an underground connection to existing 110kV overhead line located east of the development will need to be connected to the proposed substation. It will involve the installation of two new lattice towers within the existing OHL. The existing OHL conductor will be terminated at these two lattice towers in order to facilitate connection to the wind farm substation. The overhead line will be temporarily disrupted, it is estimated that works will take approximately one day with minimum disturbance to electricity supply in the area.

In the event that the alternative underground cable route connection to the granted Tullamore Solar Farm substation is adopted, then, when the commissioning of the line and grid connection to the Tullamore Substation is taking place, there will be a localised outage that will typically take 1 day to complete. This represents a localised temporary outage for the purposes of connection and commissioning.

15.4 MITIGATION

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

15.4.1 Roads and Traffic

15.4.1.1 Construction Phase

The construction phase mitigation measures are incorporated within the construction phase design and measures, assessed in this foregoing section. No additional mitigation measures are proposed as no significant adverse impacts are envisaged.

15.4.1.2 Operational Phase

The proposed development will not have a significant operational traffic impact; therefore, no mitigation measures are proposed.

15.4.1.3 Decommissioning Phase

The decommissioning phase mitigation measures for the removal of wind turbines will be similar to the construction phase mitigation measures for the delivery of wind turbines, assessed in this foregoing section. No additional mitigation measures are proposed as no significant adverse impacts are envisaged.

15.4.2 Built Services

15.4.2.1 Electricity Supply and Infrastructure

Mitigation by design has been adopted whereby the grid connection methodology for the proposed development has been selected to utilise existing built infrastructure as discussed in **Chapter 4 Alternatives**. Ecological, field and desktop assessments have been applied to determine project development infrastructure locations and mitigation by avoidance of any constraints. Internal cables, within the site boundary, will be laid underground to avoid effects on hedgerows and disturbance to nesting birds. The proposed substation connection to 110kV will require an underground connection approximately 225m in length.

There is no anticipated effect upon the grid network outside of the infrastructure for the proposed development itself. The proposed development will not result in any significant effects on grid capacity but will provide a potentially positive effect of the electricity supply infrastructure. Therefore, no specific mitigation measures are required.

15.4.2.2 Television and Telecommunications

In the unlikely event of interference to television and telecommunication services arising from the wind farm development, the Applicant is committed to working 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 for resolving any issue of interference with television reception as a result of the proposed development.

15.4.2.3 Aviation

Whilst the proposed development will not impede aircraft flying the test trajectories, the navigational aids assessment recommends that it would be prudent to ensure that pilots of test aircraft are fully aware of the presence of wind turbines, and any associated meteorological masts, before undertaking any test flights. The following mitigation measures are therefore recommended:

- All turbines and meteorological masts having a height of 100m or more are promulgated in the Irish Air Navigation Obstacle database;
- The extremities of the wind farm are lit;
- Meteorological masts are lit;
- Meteorological masts are painted red and white to aid visibility to pilots;
- Locations of meteorological masts having a height of less than 100m are promulgated to the pilots of test aircraft;
- Test aircraft are fitted with Terrain Awareness and Warning System (TAWS);
- Test aircraft TAWS obstacle databases are regularly updated to ensure they contain the wind turbine and met mast locations prior to construction.

Having regard to the above:

- The developer shall agree an aeronautical obstacle warning light scheme for the wind farm development;
- The developer shall provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location;
- The developer shall notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.

15.4.2.4 Water and Wastewater Infrastructure

All wastewater to be taken off-site is to be undertaken by an authorised waste contractor and brought to an authorised waste facility.

15.4.3 Waste Management

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

All waste for offsite treatment/disposal is to be stored temporarily in appropriate dedicated 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 as included in **EIAR Volume 3 Appendix 2-1**.

15.4.4 Forestry Resources

Mitigation measures against the impact on forestry include replanting areas so that there is no overall loss of forestry. A specific area for the replanting of the felled forestry has been identified to the northwest of the proposed development site.

15.5 RESIDUAL EFFECTS

Residual effects section outlines the degree of environmental change that will occur after the proposed mitigation measures have taken effect.

15.5.1 Roads and Traffic

The proposed construction and decommissioning works will have slight to moderate short-term negative effects. The proposed development will result in additional traffic during the construction phase and very minor traffic during the operational phase. Any required road improvements will be undertaken during the construction phase and therefore will have a positive long-term residual effect.

15.5.2 Built Services

15.5.2.1 Grid Capacity and Electrical Infrastructure

The effects on grid capacity and electricity infrastructure are considered a positive impact on the national electricity supply as a result of the proposed development.

15.5.2.2 Television and Telecommunications

In the event interference is established and following the implementation of suitable mitigation measures in full; the residual effects on television services or telecommunication services are considered to be imperceptible as a result of the proposed wind farm development.

15.5.2.3 Aviation

The residual effects on aviation anticipated as a result of the proposed development are considered not significant.

15.5.2.4 Water and Wastewater Infrastructure

The residual effects on water and wastewater infrastructure assets are considered imperceptible as a result of the proposed development.

15.5.3 Waste Management

The disposal requirements for turbine blades are considered a moderate negative residual effect.

15.6 CONCLUSION

In conclusion, the proposed wind farm and associated development including the underground grid connection and on-site substation, is unlikely to constitute a significant adverse impact to material assets in the vicinity of the proposed development.

The operation of the turbines will make a positive contribution to the supply of renewable energy. In terms of material assets, the proposal presents an opportunity for a positive effect in the use of renewables as it can correlate to a reduction in the use of fossil fuels. It will contribute to ensuring that adequate electricity supplies are available to support economic activity and growth.

REFERENCES

Department of the Environment, Heritage and Local Government (2006). Wind Energy Development Guidelines.

Department of the Environment, Heritage and Local Government (2019). DRAFT Wind Energy Development Guidelines.

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

Environmental Protection Agency (EPA) (2002). Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

EPA (2003). Advice Note on Current Practice in the Preparation of Environmental Impact Statements.

EPA (2015). Draft Advice Notes for Preparing Environmental Impact Statements.

EPA (2017). Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

European Union (2017). Environmental Impact Assessment of Projects: Guidance on Scoping.

IWEA (2012). Best Practice Guidelines for the Irish Wind Energy Industry

Transport Infrastructure Ireland (TII) (2017): TII's Rural Road Link Design DN-GEO-03031.

TII (2019): Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017.

Wind Europe (2017). Discussion Paper on Managing Composite Blade Waste. [online] Available at: <https://windeurope.org/wp-content/uploads/files/policy/topics/sustainability/Discussion-paper-on-blade-waste-treatment-20170418.pdf> [Accessed 25/6/20]