GALETECH
ENERGY SERVICES

Cush Wind Farm
Phase II

Environmental Impact Assessment Report

Chapter 14: Material Assets

Cush Wind Limited

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14.1 INTRODUCTION

Material assets comprise resources, services and infrastructure that may be affected by a proposed development. This chapter assesses potential effects on material assets, including transport and access infrastructure, aviation, telecommunications, utilities and other infrastructure. Other environmental factors, including biodiversity, water, air quality, landscape and cultural heritage, are assessed in their respective chapters of this EIAR.

14.1.1 DESCRIPTION OF THE PROJECT

The project site is located in rural Co. Offaly, approximately 4 km north of the town of Birr and c. 28 km south-west of Tullamore, Co. Offaly.

The project assessed within this EIAR comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I, together with all associated and ancillary infrastructure and works. This includes turbine foundations, crane hardstanding areas, access tracks, internal wind farm underground cabling, site drainage and rehabilitation works, peat/spoil management, a proposed electrical switch room building, and c. 5 km of underground electricity line to connect the proposed wind farm to the national electricity network at the separately proposed Mullanafawnia 110 kV substation. A description of the project, including the turbine delivery haul route, is presented in **Chapter 3**.

14.2 TRANSPORT & ACCESS

14.2.1 INTRODUCTION

14.2.1.1 Overview

Galetech Energy Services ('GES') has undertaken an assessment of the likely significant effects on transport and access arising from the construction, operation and decommissioning of the project.

The assessment considers the potential effects of project-related traffic on the road network, including the turbine delivery haul route, together with site access arrangements during each phase of the project. The relevant sections of this chapter should also be read in conjunction with the Route Access Survey enclosed at **Annex 3.5**.

14.2.1.2 Statement of Authority

The assessment of likely significant effects on transport and access has been undertaken by various members of the GES Environment and Planning Team. GES has substantial experience in undertaking such assessments, having prepared Material Assets (Transport & Access) chapters for numerous permitted and proposed developments which have been subject to EIA. The competence and relevant experience of the GES team members are presented in **Chapter 1**.

14.2.2 METHODOLOGY

14.2.2.1 Assessment Methodology

This assessment was undertaken using the following methodology, with further details provided in the sections below:

- Review of relevant legislation, policy and guidance;
- Desk study, including review of available maps and published information;
- Project site walkover;
- Windshield survey of the turbine delivery haul route and underground electricity line route, including a walkover survey of all noteworthy locations;
- Windshield survey of likely construction material haul routes;
- Evaluation of likely effects;
- Evaluation of the significance of these effects; and,
- Identification of measures to avoid and mitigate any likely effects.

14.2.2.2 TI Design Publications

The Transport Infrastructure Ireland (TII) website[1] provides access to standards, specifications and guidance relating to the national road network. The TII publications relevant to the design and assessment of the project's transport and access arrangements include:

- Geometry Series (GEO) including; DN-GEO-03031 Road Link Design, DN-GEO-03030 Design Phase Procedure, DN-GEO-03036 Cross Sections and Headroom, and DN-GEO-03060 Geometric Design of Junctions;
- Standard Construction Details (SCD);
- Specification for Works (SPW);
- Safety (STY);
- Policy (POL)
- Planning and Development (PDV), including PE-PDV-02045 Traffic and Transport Assessment Guidelines;
- Project Appraisal Guidelines (PAG), including: PE-PAG-02017 Travel Demand Projections, PE-PAG-02038 Estimating AADT on National Roads, and PE-PAG-02038 Expansion Factors for Short Period Traffic Counts;
- Pavement (PAV), including; DN-PAV-03021 Pavement and Foundation Design, DN-PAV-03023 Surfacing Materials for New and Maintenance Construction, and DN-PAV-03024 Bituminous Materials, Surface Treatments;
- Drainage (DNG); and
- Earthworks (ERW).

14.2.2.3 Planning Policy & Guidelines

This assessment has been prepared and carried out in accordance with guidance contained in the following published documents:

- European Commission (2017) *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*;

[1] http://www.tiipublications.ie/

- Department of Housing, Local Government & Heritage (August 2018) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*;
- Environmental Protection Agency (September 2015) *Draft - Advice Notes on Current Practice (in the preparation on Environmental Impact Statements)*;
- Environmental Protection Agency (May 2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*;
- *Offaly County Development Plan 2021–2027* ('the Offaly CDP 2021-2027');
- *Galway County Development Plan 2022–2028* ('the Galway CDP 2022-2028');
- Department of Housing, Local Government and Heritage – *The Design Manual for Urban Roads and Streets;*
- Transport Infrastructure Ireland *The Design Manual for Roads and Bridges*;
- Transport Infrastructure Ireland *Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions) DN-GEO-03060* (May 2023);
- Transport Infrastructure Ireland *Rural Road Link Design DN-GEO-03031*(April 2017);
- Transport Infrastructure Ireland *Traffic and Transport Assessment Guidelines*; and
- Department of Transport Circular RW 18 of 2024, *Exceptional Abnormal Loads* (23 September 2024).

An assessment of the relevant transport policies and objectives of the Offaly CDP 2021-2027 are set out in **Table 14.1**, below. Policies and objectives which are not considered to be relevant have been excluded from further assessment.

Planning Policy / Objective	Assessed	Comment
SMAP 22: It is the policy of the Council to:- Facilitate development of the road network in Offaly and the midland region in accordance with the National Development Plan and with Government policy. The Council will also support the relevant agencies and bodies involved in achieving such development including Transport Infrastructure Ireland and the National Transport Authority.	Yes	While this policy is not directly relevant, the project will be undertaken to ensure that all associated works are undertaken in accordance with the requirements of all relevant agencies and bodies.
SMAP 23: It is the policy of the Council to:- Strictly control development, outside of identified settlements, which could generate significant additional traffic, thereby potentially compromising the capacity and efficiency of the national roads/restricted regional roads and associated interchanges and possibly lead to the premature and unacceptable reduction in the level of service available to road users. This policy will also apply to national roads which may be downgraded during the lifetime of this Plan but which will still comprise high quality regionally important links.	Yes	The project will be undertaken to ensure that there are no adverse effects on the safety or capacity of the national road network.
SMAP 24: It is the policy of the Council to:- Maintain and protect the safety, strategic transport function, capacity and efficiency of	Yes	As per above, the project will be undertaken to ensure that there are no adverse effects on the safety or

Planning Policy / Objective	Assessed	Comment
national roads, motorways and associated junctions and in accordance with Strategic Planning and National Roads Guidelines 2012 or any subsequent edition.		capacity of the national road network.
SMAP 34: It is the policy of the Council to:- Recognise the importance of hedgerows and roadside boundaries for wildlife and biodiversity when designing or inputting into road schemes. Retention of such features should be incorporated into design and where this is not possible, replacement planting with native species of indigenous provenance shall be provided.	Yes	While this policy is not directly relevant, the project has been designed in such a way as to minimise the level of hedgerow and roadside boundary removal. Where removal is necessary, compensatory/replacement measures have been incorporated into the project design.
SMAO 15: It is an objective of the Council to:- Improve and maintain regional and county roads in line with the annual roads programme and allocated budgets.	Yes	While this objective is not directly relevant, project works will be undertaken in accordance with the requirements of all relevant agencies and bodies.

Table 14.1: Offaly CDP 2021-2027 Transport Policies & Objectives

14.2.2.4 Desk Study

A desk study of the proposed project, including the proposed wind farm, switch room, underground electricity line, turbine delivery haul route and the surrounding area was undertaken. The sources of information included documentary sources, outlined at **Section 14.2.2.2**, and an evaluation of aerial imagery and visualisations (e.g. Google Maps and Streetview) to assess the nature and condition of the local road network.

14.2.2.5 Fieldwork

A site visit; including a windshield survey of the proposed turbine delivery haul route, likely construction material haul routes, and underground electricity line route; was undertaken in March 2026. The proposed site entrance and noteworthy locations along the turbine delivery haul route and underground electricity line route were the subject of a walkover survey. The site visit was used to verify information obtained as part of the desk study and to visually assess site entrance locations and associated vehicle visibility splays.

14.2.2.6 Evaluation of Likely Effects

Following the assessment of the baseline environment, the available data was used to identify and categorise likely effects to affect the local road network used for the turbine delivery route and construction materials haul route.

The statutory criteria for the assessment of impacts require that likely impacts are described with respect to their magnitude, nature (i.e. negative, positive or neutral), transboundary nature (if applicable), intensity and complexity, probability, duration, frequency, reversibility, cumulation and possibility of reducing the effects. The descriptors used in this chapter are those set out in the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022).

Impacts may be categorised as follows:-

- Direct: where the existing traffic and transport environment in proximity to the project is altered, in whole or in part;

- Indirect: where the traffic and transport environment beyond the project is altered by activities related to the construction, operation, and decommissioning of the project; and
- No Impact: Where the project has neither negative nor a positive impact upon the traffic and transport environment.

Sensitivity

The sensitivity of the local transport infrastructure has been identified using the criteria outlined within the TII Guidance. These criteria are outlined in **Table 14.2** below.

Importance	Criteria
Very High	Attribute has a high quality, significance or value on a regional or national scale.
High	Attribute has a high quality, significance or value on a local scale.
Medium	Attribute has a medium quality, significance or value on a local scale.
Low	Attribute has a low quality, significance or value on a local scale.

Table 14.2: Criteria for Rating Site Attributes

Magnitude

The magnitude of likely effects has been defined in accordance with the criteria provided in the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) as outlined within **Table 14.3** below.

Magnitude of Impact	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 14.3: Impact Assessment Criteria

Significance Criteria

The significance of the likely effects of the project have been classified by taking into account the sensitivity of receptors and the magnitude of the effects on them, combined with the likelihood of an event occurring as defined in **Table 14.4**.

Magnitude of Impact					
Importance of Attribute		Negligible	Small	Moderate	Large
	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
	High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Severe/ Significant

	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Table 14.4: Rating of Significant Environmental Impacts

14.2.3 DESCRIPTION OF EXISTING ENVIRONMENT

14.2.3.1 Site Location & Road Network Context

The road network in the vicinity of the project generally comprises a mix of national, regional and local roads.

A total of 3 no. site entrances will be required to facilitate access to the project site.

It is proposed to use 1 no. construction phase and 1 no. operation phase access permitted as part of Cush Wind Farm Phase I[2] as part of the project, this includes; 1 no. construction phase site entrances from the N62 national road (eastern side), which will provide access to the proposed wind farm and will be used to transport construction materials and turbine components (including abnormal-sized loads) to the site, and 1 no. operation phase site entrance from the L300321 local road.

Following the construction phase, the specifications of the temporary construction phase site entrance will no longer be needed to accommodate abnormal-sized loads. This entrance will be fenced off and will only be used in rare occasions in the event of a major turbine component replacement during the operation phase of development (e.g. replacing a turbine blade or gearbox/generator).

The N62 national road, which will provide access to the project site for turbine component and construction material deliveries, is of a good condition and would appear to be subject to regular maintenance. It is anticipated that construction works for the project will be carried out at the same time as the construction process for the permitted Cush Wind Farm Phase I.

Following the construction phase, the specifications of the temporary construction phase site entrance will no longer be needed to accommodate abnormal-sized loads. The entrance, as permitted, will be fenced off and will only be used in rare occasions in the event of a major turbine component replacement during the operational phase of development (e.g. replacing a turbine blade or gearbox/generator).

1 no. permitted operation phase site entrance, located along the L300321 (local road east of the project site), will be used to facilitate operation phase traffic. In addition a separate site entrance is required, from the L300321 local road, in order to facilitate access to the proposed electrical switch room building. Access to the switch room will be required during both the construction and operation phases of the project.

The L300321 is a cul-de-sac single carriageway road which provides local access to dwellings and farms from the nearby N52 (to the east). This road exhibits signs of deterioration; however localised remedial works (patching) has been completed. As set out within the plans and particulars to accompany the planning application for Cush Wind Farm Phase I, the existing access laneway from the edge of the L300321 to the eastern side operation phase site entrance will be made good and maintained for the duration of the project.

[2] An Coimisiún Pleanála Reference: ABP-318816-24

Works along the turbine delivery haul route are set out at **Annex 3.5** and will include temporary widening of roadside verges including temporary hardcoring of roadside verges, trimming and removal of trees and hedgerows, removal of street furniture and construction of a short section of access track to facilitate the reverse manoeuvre at the N52/N62 junction, as permitted as part of Cush Wind Farm Phase I. Permanent works are required at 1 no. location along the haul route, at the Junction of the R339 regional road and Connolly Avenue in Galway City, accommodation works will be required on private lands in order to remove a small section of wall and fence[3] to facilitate unrestricted passage of turbine components.

It should be noted that the precise traffic routes to and from the project site can only be determined prior to the commencement of construction. Accordingly, therefore, it is proposed that the final routes will form part of a Traffic Management Plan to be prepared prior to the commencement of development following consultation with the Planning Authority.

The proposed wind farm will connect to the proposed electricity substation via c. 5km of underground electricity line. From the proposed switch room, the underground electricity line ('UGL') will cross private lands, in a south eastern direction, to the point where it meets the N52 national road, at this point the UGL will be installed under the road via Horizontal Directional Drilling (HDD). On the opposite side of the N52 the UGL will continue toward the southeast within private lands until it meets the L7006 local road. At this point the UGL will again cross under the road via HDD, where it will be installed in private lands to the point where it connects to the Mullanfawnia 110kV substation. The installation of the UGL will not result in any direct interaction with the public road.

14.2.3.2 Construction Material Haul Routes

Turbine Delivery Haul Route

The likely turbine component haul route is described in the Route Access Survey at **Annex 3.5** and utilises the N6, M6, N52 and N62 before accessing the project site via the construction phase site entrance on the eastern side of the N62, as permitted as part of Cush Wind Farm Phase I. The Route Access Survey which accompanied the EIAR for the permitted Cush Wind Farm Phase I included an assessment of the haul route from Galway Port. The Route Access Survey included with this EIAR (**Annex 3.5**) has been updated to account for the integrated design flexibility aspect of the proposed wind farm (see **Section 1.8.3, Chapter 1**), including the potential for larger (length) turbine blades, depending on the turbine model/configuration which is ultimately selected for the project site. The Route Access Survey at **Annex 3.5** has been undertaken based on the maximum turbine blade length, corresponding to a rotor diameter of 175m. This results in an overall transport vehicle length of c. 100.48m, as illustrated in **Figure 14.1** below.

While the selection of a precise port of entry can only be determined following appointment of the chosen turbine manufacturer (to be completed post-consent

[3] These permanent upgrade works are assessed in this EIAR as secondary/off-site works associated with the project. They do not form part of the development for which planning permission is sought from Offaly County Council, the extent of which is defined by the plans and particulars accompanying the planning application.

subject to a competitive procurement process), it is considered likely that the Port of Galway will be utilised in this case[4].

Consequently, it is proposed that the Planning Authority will be advised of the selected port of entry as part of a final Transport/Traffic Management Plan, and that any specific traffic control measures arising from the selected route will be agreed with the Planning Authority prior to the commencement of development. Given that access from all potential port options to the construction phase project site entrance is readily achievable via the national road/motorway network, the ultimate selection of a port of entry has no bearing on the findings of the assessment undertaken in this chapter. The delivery of turbine components along this route will require the completion of temporary and permanent alteration works at a number of locations. The extent of these works is described in full at **Chapter 3** and at **Annex 3.5**.

Construction Material Haul Routes

The undertaking of civil engineering works during the construction phase of the project; including the construction of the site entrance (proposed switch room compound), access tracks, crane hardstands, and turbine foundations; will require the importation of aggregates and other general construction materials to the project site. However, the importation of construction materials will not require abnormal or over-sized loads to be brought to site and no specific road improvements are required.

Site analyses have indicated that little to no rock will likely be encountered during the excavation of turbine foundations etc. and thus it is not anticipated that significant volumes of rock will be available for reuse in the construction of access tracks and crane hardstands. Consequently, it is assessed that the rock/stone to be imported to the project site will include rough stone as well as capping material (CL804). Other construction material, such as ready-mix concrete and sand, will be sourced from local licensed quarries, subject to a competitive tendering process.

As the selection of material suppliers will be subject to a competitive tendering process prior to construction, it is not possible to confirm the precise source of these materials at this stage. However, a number of candidate quarries have been identified as potential suppliers and are identified at **Annex 2.2**. In addition, the likely haul routes from these suppliers to the site entrances are also identified. While the haul routes do not always represent the most direct route to site, these routes have been selected to ensure, insofar as is practicable, that all movements occur on national and regional roads and, insofar as possible, avoid local roads which may not be suitable to accommodate HGVs. The Planning Authority will be advised of the selected material suppliers as part of the Transport/Traffic Management Plan to be agreed prior to the commencement of development.

Other material deliveries will use standard HGVs and utilise the local, regional and national road network, as necessary. Staff employed on the site will use the site entrances to access the project site; however, as the majority of associated vehicular movements will comprise light goods vehicles (LGVs) or cars, they will not be restricted to the use of specific roads.

[4] Turbine components may also be imported through other ports including Dublin Port, Port of Waterford or Foynes/Shannon/Limerick Port. Each of these ports are regularly used in the transportation of turbine components and are readily accessible without the need for significant road upgrade works between their location to the national road network.

Construction materials for the underground electricity line will, as above, be subject to a competitive tendering process prior to construction. It is likely that materials will be sourced from one (or more) of the quarries identified at **Annex 2.2**. Once again, suppliers will be encouraged to utilise the national and regional network and to avoid the local network insofar as practicable.

14.2.3.3 Road Access to the Project Site

As identified above, a total of 3 no. site entrances will be utilised as part of the proposed project.

It is proposed to use 1 no. construction phase and 1 no. operation phase access, each of which were permitted as part of Cush Wind Farm Phase I, as set out at **Section 14.2.3.1** above. Access arrangements for this part of the project will comprise the upgrading, and use, of existing agricultural/forestry access points.

In addition a new separate site entrance is proposed, from the L300321 local road, in order to facilitate access to the proposed electrical switch room building. Access to the switch room will be required during both the construction and operation phases of the project. The access point has been carefully considered as part of the project design process which has been particularly cognisant of the provision of appropriate vehicle visibility splays (sightlines) to ensure compliance with the requirements of the *Offaly CDP 2021-2027*[5].

14.2.3.4 Delivery Vehicle Specification

The delivery of wind turbine components will be carried out by specialised HGVs. The largest vehicles to be used will facilitate the delivery of the wind turbine blades. **Figures 14.1-14.3** illustrate the typical suite of transportation vehicles which will be used in the delivery of components, including a transportation vehicle used to transport the blade component.

[5] Section 13.9.11 of the Offaly CDP 2021-2027.

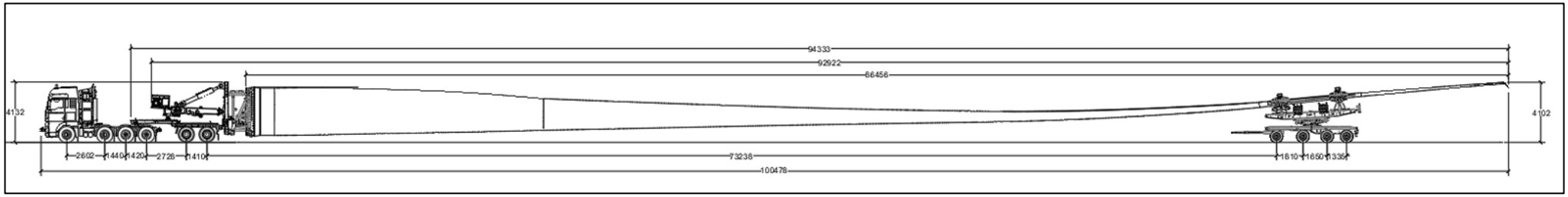

Figure 14.1: Typical Blade Section Transporter

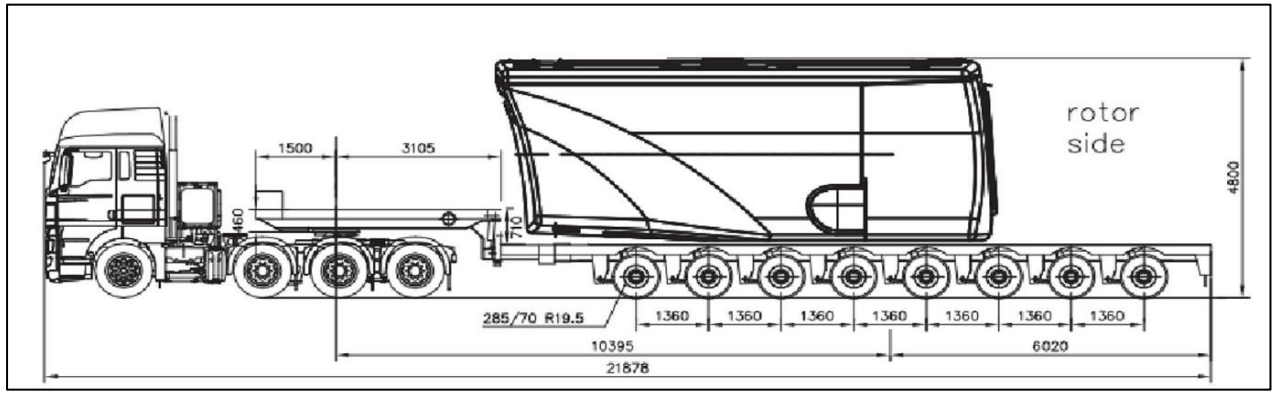

Figure 14.2: Typical Nacelle Transporter

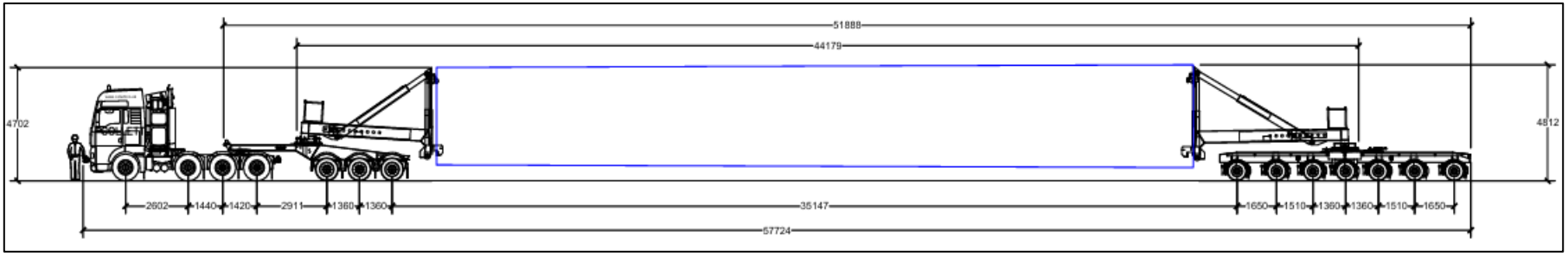

Figure 14.3: Typical Tower Section Transport

Delivery of general construction materials and aggregates to site for the construction of the proposed wind farm will be undertaken using standard HGVs, cement mixer trucks, and dump trucks (see **Figure 14.4**), the largest of which is anticipated to be a 16.5m articulated vehicle as shown in **Figure 14.5** below.

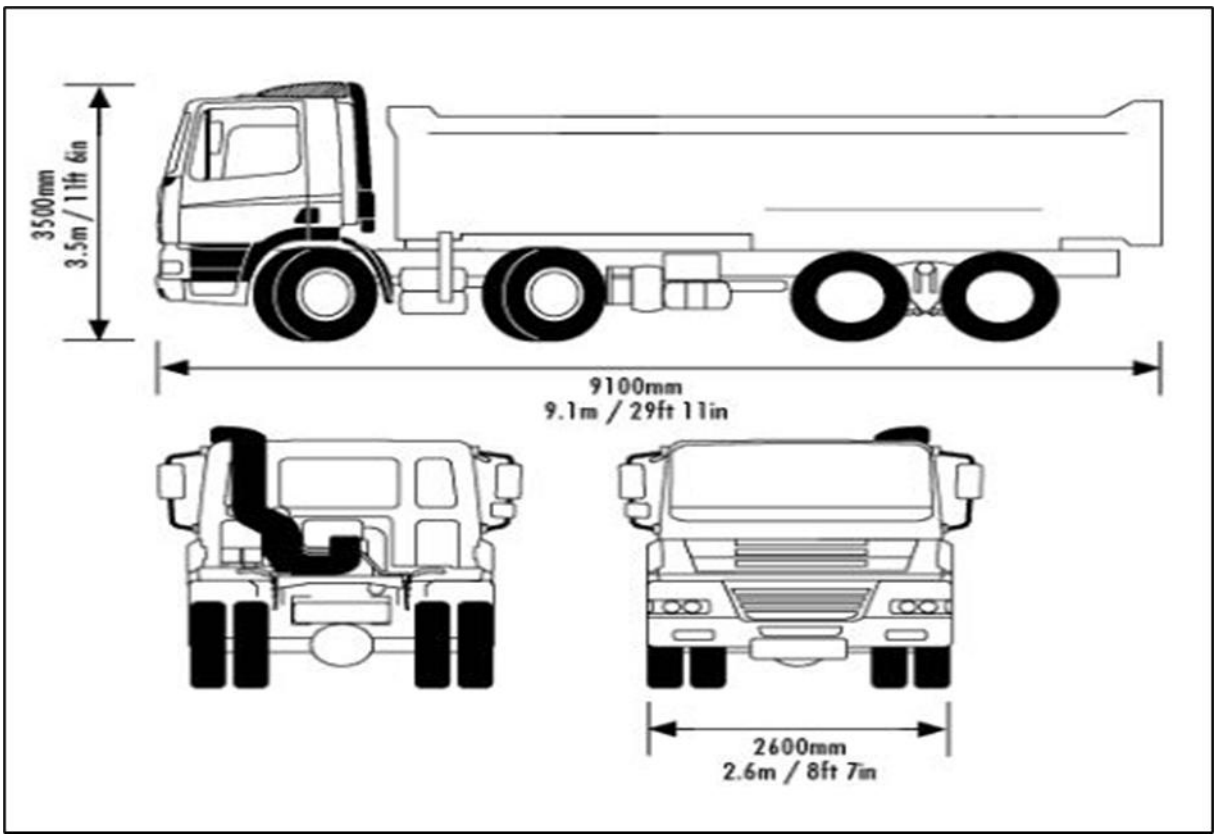

Figure 14.4: Standard Rigid Tipper Truck

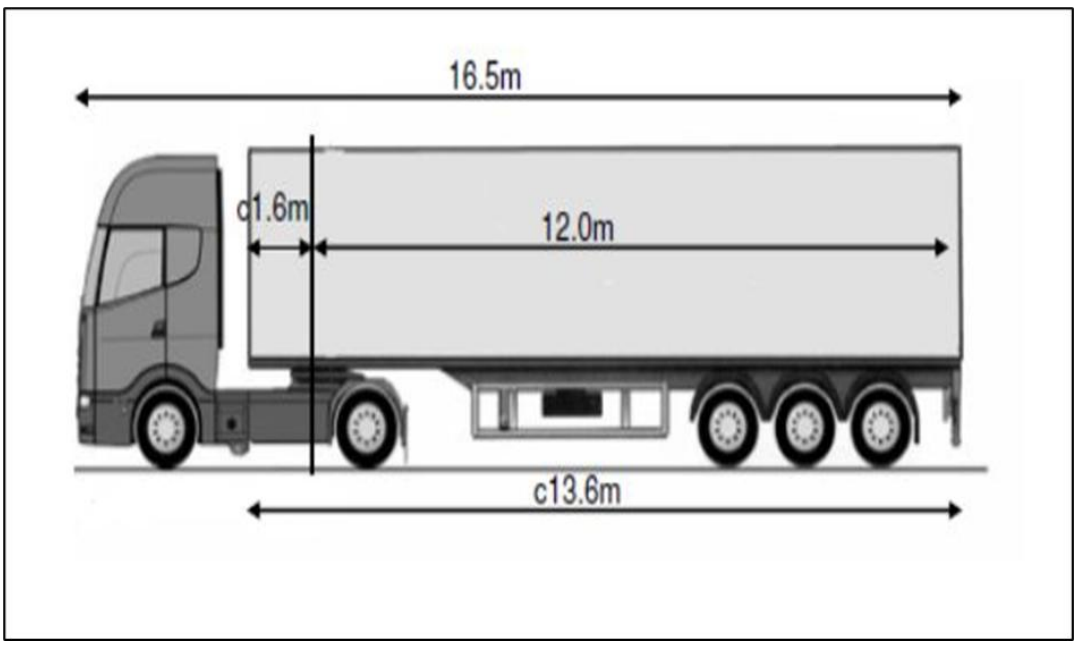

Figure 14.5: Standard HGV

14.2.4 DESCRIPTION OF LIKELY EFFECTS

14.2.4.1 Construction Phase

The construction period of the project is estimated to take approximately 15-18 months, with the majority of traffic movements being associated with the construction of access tracks, hardstands, turbine foundations, switch room and underground electricity line. During this period, there will be trips associated with the arrival and departure of construction staff and with the delivery of aggregates, reinforcing steel and ready-mix concrete. Staff trips will mainly be made using cars and vans, while deliveries of steel, concrete, stone and other general construction materials will be made by HGV.

The construction phase of the development will comprise a 6-day week with normal working hours from 07.00 to 19.00 Monday to Friday and 07.00 to 13.00 on Saturdays. It may be necessary to undertake works outside of these hours to avail of favourable weather conditions (e.g. during times of low wind speeds to facilitate turbine erection etc.) or during extended concrete pours (e.g. turbine foundation pours must be completed within 24 hours etc.). Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

Switch Room Site Entrance

One new site entrance will be provided to serve the proposed switch room. Visibility splays of 90m in both directions will be provided at this entrance[6], as shown on the planning drawings accompanying the application.

All works related to the construction of the entrance will be undertaken from private lands which will ensure that there are no significant direct or indirect transport and access effects on the local road network through disruption or delay to traffic flows. However, the implementation of road safety measures (e.g. Stop/Go system) may result in some brief disruption or delays. However, priority will be given to public road users at all times thus avoiding any significant effects on traffic flows.

Consequently, effects are assessed to be likely, slight, negative, and short-term.

Underground Electricity Line

The UGL, from the proposed switch room to the proposed Mullanafawnia 110kV electricity substation, will be located within private lands. As noted in **Section 3.4.2.2, Chapter 3**, the underground electricity line (c. 5km in length) crosses public roads at the N52 national road and at the L7006 local road at Clonbeale Beg Glebe, where it will be placed under the carriageway. The remainder of the underground electricity line will be situated in private lands (off road). The proposed UGL will be installed under the public road using Horizontal Directional Drilling (HDD).

Therefore, the effect on transport and access is assessed to be indirect, slight, negative, and temporary in nature.

Haul Route for Abnormal Loads

[6] Offaly County Development Plan 2021–2027, Chapter 13, Section 13.9.11, DMS-97: Safe Sight Distances required for access onto National, Regional and Local Roads.

While the proposed turbine delivery haul route is assessed to be generally capable of accommodating abnormal loads, upgrade/accommodation works will be required at a total of 23 no. locations, with one of these locations requiring permanent works and all others requiring temporary accommodation works or removal of road signs and/or street furniture, to facilitate turbine component deliveries, as discussed at **Chapter 3** and **Annex 3.5**.

Accommodation works along the turbine component route are relatively minor in nature and will include, for example, temporary hardcore at roundabout islands and roadside verges, and temporary removal of street furniture and signage. Permanent works include the removal of a small section of roadside wall on private lands in Galway City (R339 junction with Connolly Avenue). The effects of the proposed alterations are assessed as not likely to be significant and direct, indirect, moderate-negative and short-term. Therefore, the overall effect on transport and access is assessed as likely to be direct, indirect, temporary and moderate-to-slight.

It is noted that while the delivery of 'abnormal size' loads are a common feature of wind energy developments (i.e. turbine components), 'abnormal weight loads' are relatively uncommon. Generally, and as will be the case in this instance, the appointed transportation contractor will select appropriate delivery vehicles, with a sufficient number of axles, to ensure that loadings do not exceed the standard axle weight requirements set out under Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003)(as amended). This will ensure that no load will constitute an 'abnormal weight load' and will ensure that the structural integrity and surface condition of the public road network; national, regional and local; is protected. Notwithstanding this, all relevant stakeholders, including local authorities, will be consulted prior to the delivery of turbine components and all necessary licences and permits will be obtained.

Department of Transport Circular RW 18 of 2024, *Exceptional Abnormal Loads* (23 September 2024), has also been taken into consideration. The Circular sets out the assessment process applicable to Exceptional Abnormal Loads, including vehicles which do not conform with the requirements of the *Road Traffic (Construction and Use of Vehicles) Regulations* and which exceed the applicable exceptional load thresholds. The turbine component deliveries associated with the project will be undertaken using appropriately configured vehicles such that the applicable axle and gross vehicle weight requirements will not be exceeded. Accordingly, the project will not involve the transport of Exceptional Abnormal Loads for the purposes of Circular RW 18 of 2024 and the specific assessment procedure set out therein is not triggered. Turbine component deliveries will nevertheless constitute abnormal/oversized loads by virtue of their dimensions and will be undertaken in accordance with the standard abnormal load notification, licensing and permitting requirements of the relevant road authorities and An Garda Síochána.

Accordingly, as the project[7] will not involve abnormal-weight or Exceptional Abnormal Loads, a route-wide structural capacity assessment is not considered warranted. Notwithstanding this, consultation will be undertaken with the relevant road authorities in advance of turbine component deliveries and, should a specific concern be identified in respect of the capacity of an individual bridge or other structure, an appropriate structural assessment will be undertaken to demonstrate its suitability to

[7] It is noted that the N52 & N62 National Roads were utilised as a haul route during the construction phase of the operational Meenwaun, Cloghan and Derrinlough Wind Farm's.

accommodate the proposed delivery vehicles.

HGV Deliveries

Proposed Wind Farm

The estimated timescale for the completion of the construction phase is approximately 15-18 months, inclusive of all works related to the construction of the proposed wind farm switch room, underground electricity line, and erection and commissioning of turbines. This allows approximately 12 months for civil construction and approximately 3-6 months for erection and commissioning of the turbines.

As detailed at **Table 14.5**, it is estimated that during civil construction, approximately 7,730 no. loads will be delivered to site. Assuming a 12-month civil works construction phase, this equates to approximately 644 no. loads per month or an average of 26 no. loads per day excluding Sundays and public holidays. It should also be noted that vehicular movements will occur throughout the day and will not be concentrated at particular times.

The peak number of deliveries per day will occur during the concrete pours for turbine foundation construction. An estimated 145 no. ready-mix trucks and other truck deliveries will be required per turbine foundation. Other materials are also likely to be delivered on such days, and therefore a realistic estimation of peak deliveries during the 3-days of foundation pours (1-day per foundation) is approximately 160 no. deliveries per day. These pours may take place from 06:00 and typically take 12-hours to complete and involve approximately 13 no. trucks per hour.

The majority of civil construction material, such as aggregates (as required) and concrete, will be delivered to site using standard rigid trucks, HGVs and ready-mix trucks. And aggregates to be imported to the wind farm will generally comprise capping material.

Full details of the volumes of construction materials to be sourced on-site and those to be imported from local suppliers are detailed at **Table 3.4** (**Chapter 3**); while the traffic/HGV volumes associated with imported materials are detailed at **Table 14.5** below. All spoil generated within the project site will be re-used for reinstatement of landscaping purposes or, where excess arises, stored permanently in the peat/spoil deposition area.

Turbine components will be delivered to site over a period of approximately 4-9 weeks after civil works are substantially completed. It is estimated that approximately 140 no. loads of turbine components and crane parts will be delivered during this period. Some of these loads (turbine tower sections, nacelles and blades) will be classified as oversized abnormal loads and the relevant approvals and permits will be obtained by the turbine supplier, or its appointed haulage contractor, before deliveries take place.

Following completion of the construction works, it is estimated that approximately 30 no. loads will be needed to remove all temporary equipment, plant and machinery and materials used on site e.g. temporary compound, fencing, cabins, storage containers etc.

Proposed Switch Room & Underground Electricity Line

All construction materials associated with the proposed switch room and underground electricity line (grid connection) (incl. stone and concrete) will be imported from approved local suppliers. Full details of the volumes of construction

materials are detailed at **Table 3.4** (**Chapter 3**); while the traffic/HGV volumes associated with imported materials and removal of excavated material are detailed at **Table 14.5** below.

It should be noted that the vast majority of excavated material from the underground electricity line route will be retained and used for reinstatement of trenches.

Despite its linear extent, the underground electricity line route is not assessed as likely to give rise to significant volumes of vehicle movements at any specific location. Furthermore, due to the linear nature of the underground electricity line, vehicle movements will be spread out across the route and will result in an indirect, likely, slight, and short-term effect on transport & access.

Haul Route Accommodation/Upgrade Works

It is noted that the turbine delivery haul route from Galway Port to the project site remains consistent with that assessed for the permitted Cush Wind Farm Phase I. However, the current project incorporates design flexibility in turbine dimensions, including a marginal increase in maximum rotor diameter (up to 175m) compared to the 172m assessed for Phase I.

An updated Route Access Survey has therefore been undertaken, see **Annex 3.5**, to reflect the maximum blade length. While the established haul route remains suitable, the revised assessment identifies some minor variations to the accommodation works required at discrete locations along the route. Accordingly, vehicle movements associated with these updated haul route upgrade works have been included in this assessment, see **Table 14.5** below.

The cumulative assessment at **Section 14.2.4.4** below considers all estimated vehicle movements during the construction phase of the project, including those associated with haul route upgrades, and assumes that construction will occur concurrently with the permitted Cush Wind Farm Phase I.

Material	Quantity	Deliveries/Trips
Proposed Wind Farm		
Site mobilisation (incl. construction compound setup, plant, machinery, traffic management measures/equipment, etc.)	-	20
Miscellaneous construction materials (incl. geotextile mats, fencing, electrical ducting and cables, pipes/culverts, etc.)	-	60
Imported stone (& sand) for access tracks & crane hardstandings	54,876m^3	6,456
Concrete (turbine foundations)	3,390m^3	424
Turbine tower sections	-	75
Nacelles	-	10
Turbine blades	-	10
Wind turbine electrical equipment (incl. transformers, panels, cabling, etc.)	-	10
Crane deliveries (incl. ballast, booms, etc.)	2 Cranes	35
Site de-mobilisation (removal of plant, machinery, temporary structures, etc.)	-	30

Material	Quantity	Deliveries/Trips
Proposed Switch Room and Underground Electricity Line		
Site mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	20
Imported stone (& sand) for switch room compound	206m^3	24
Concrete (switch room compound & building)	48m^3	6
Miscellaneous construction materials (incl. blocks, slates, doors, fencing, joint bays, communication chambers etc.)	-	30
Internal & external electrical equipment (incl. transformers, circuit breakers, lighting, energy storage modules, inverters, etc.)	-	30
Removal of excavated material from underground electricity line trench. No off site removal anticipated – reinstatement/landscaping.	5,946m^3	0
Electrical ducting & cabling	-	30
Imported backfill material (stone & sand) underground electricity line	2,075m^3	244
Imported backfill material (concrete) underground electricity line	-	-
Road re-surfacing material (tar & chips) underground electricity line	-	-
Site de-mobilisation (removal of plant, machinery, temporary structures, traffic management measures/equipment, etc.)	-	15
Haul Route Accomodation/Upgrade Works		
Site mobilisation and de-mobilisation (incl. plant, machinery, traffic management measures/equipment, etc.)	-	10
Imported stone (& sand)	1,600m^3	189
Road re-surfacing material (tar & chips)	10m^3	2
Total	-	7,730

Table 14.5: Estimated Construction Materials and No. of Deliveries

The expected number of HGV deliveries is based on best estimates of trips generated by similarly sized wind farms, previous experience in wind farm planning and civil construction, and based on the design of the project to date. Subject to planning permission being granted, these figures will be subject to refinement following the detailed design process, detailed pre-construction site investigations and consultation with the appointed contractor.

Based on the above estimated vehicular movements, the predicted effect on the road network as a result of the increase in HGV movements associated with the entire construction phase is assessed to be moderate, negative, direct, likely but short term. This assessment has been reached in consideration of the temporary duration of the proposed construction phase and the modest estimated average daily increase of 26 no. HGV trips (assuming a 12-month civil construction window).

Construction Personnel

The number of staff employed at the project site will vary according to the phase of

works, likely peaking at approximately 40 no. It is expected that the majority of workers will arrive on site in LGVs and crew vehicles. Vehicle sharing, subject to public health guidance, will be actively encouraged to reduce vehicular movements. It is expected that c. 14 no. vehicles will visit the site on a daily basis during the peak construction period.

Parking for staff will be provided at the permitted temporary construction compound. Staff working on the project site will utilise the permitted temporary construction compound, permitted as part of Cush Wind Farm Phase I. No parking will be allowed for construction workers on the public road network (or in areas) which are not closed to the public to allow for construction activities; and no parking will be permitted at entrances to private dwellings, business premises or agricultural holdings. The additional vehicular movements associated with staff travelling to site are not assessed as likely to result in significant effects on transport and access. Effects are assessed to be imperceptible-slight, negative, short-term and likely.

Overall Classification of Effects

The above sections have assessed the effects of the project on transport and access which may arise as a result of the construction phase. Overall, the effects are not assessed to be significant and are concluded to be likely, negative, of short-term duration and ranging between slight and moderate.

14.2.4.2 Operation Phase

During the operation phase, the project will generally be unmanned. Operational and remote monitoring activities will be carried out on an ongoing basis. However, regular visits to the site will be undertaken for routine inspections and maintenance. Under normal circumstances, the operation of the project would require an average of 1-2 no. visits to the site per week by maintenance personnel. Parking will be provided at the switch room or at the turbine hardstands during maintenance visits. In the case of a major fault; e.g. breakdown of a turbine component; larger machinery may require access to the site.

Overall, the volume of traffic predicted to be generated during the operation phase is very low. Therefore, the effect of traffic associated with the operation of the project on the existing public road network will be imperceptible as a result of the type of traffic and the low volumes typically generated.

14.2.4.3 Decommissioning Phase

During the decommissioning phase of the project, the total volume of HGV traffic will be significantly reduced compared to the construction period. This phase could be expected to last approximately 3-months. Overall, the impact of the decommissioning phase is assessed to be slight and negative of short-term duration and likely.

14.2.4.4 Cumulative Effects

The above assessment has considered the potential for in-combination effects arising from the construction, operation and decommissioning of the overall project (comprising the proposed wind farm, switch room, underground electricity line, and associated haul route accommodation works). In addition, consideration has been given to the potential for cumulative effects to arise in combination with other existing, permitted and proposed developments, including other wind energy developments within the wider study area.

Cumulative transport and access effects are most likely to arise during the construction and decommissioning phases of the project, when traffic generation is at its highest. During the operation phase, traffic associated with wind energy developments is minimal in nature, typically limited to occasional maintenance visits, and therefore the potential for cumulative operation effects is considered to be negligible (see **Section 14.2.4.2**).

Other developments considered within the cumulative assessment are identified in **Chapter 1**. The majority of these developments (e.g. one-off rural dwellings, agricultural developments and forestry activities) are small-scale in nature and do not generate significant traffic volumes during either construction or operation. In addition, operational wind energy developments within the study area, including Cloghan, Derrinlough and Meenwaun Wind Farms, generate negligible traffic volumes and do not contribute materially to cumulative effects.

In terms of permitted or proposed wind energy developments not yet constructed, the closest and most relevant development is the permitted Cush Wind Farm Phase I. As identified above, the project is expected to be constructed concurrently with Cush Wind Farm Phase I and, therefore, there is potential for cumulative transport and access effects during the construction phase.

The assessment undertaken for Cush Wind Farm Phase I identified a total of 18,330 no. HGV deliveries during its construction phase. It is noted that this figure included HGV movements associated with an on-site electricity substation and underground grid connection to the existing Dallow 110kV substation. The proposed project assesses an updated grid connection, comprising a proposed switch room and associated underground electricity line. When the HGV movements for Cush Wind Farm Phase I are adjusted (to account for the proposed grid connection arrangement as opposed to that assessed under the Cush Wind Farm Phase I project) and combined with those associated with the project, the total cumulative number of estimated HGV deliveries (movements) increases to 22,540. This total comprises HGV deliveries associated with Cush Wind Farm Phase I (8 turbines and associated infrastructure) and all elements of the project, as set out in **Table 14.5** above.

Assuming a 12-month civil works construction programme, this equates to approximately 1,878 HGV deliveries per month, or an average of 75 HGV deliveries per day (excluding Sundays and public holidays).

It is reasonably assumed that construction materials for the project (including stone/rock, sand and concrete) may be sourced from the same quarries as those identified for Cush Wind Farm Phase I. This could result in a localised increase in traffic volumes along sections of the haul route between the quarry locations and the site. However, the project is estimated to generate an average of 26 no. material delivery trips per day which, when considered in combination with Phase I traffic, does not represent a significant increase in the context of the receiving road network. Furthermore, haulage contractors will be instructed to utilise national and regional road networks wherever possible and to avoid local roads, which are considered to have adequate capacity to accommodate the predicted traffic volumes.

Having regard to the nature, scale and duration of construction traffic, the capacity of the receiving road network, and the limited number of developments with potential temporal overlap, the likely cumulative effects identified are considered to be negative, short-term and moderate-slight in magnitude during the construction phase, and negligible during the operational phase.

14.2.5 MITIGATION & MONITORING MEASURES

14.2.5.1 Mitigation

The likely adverse effects of the project have been identified as being slight-to-moderate, direct, indirect and associated with short-term construction and decommissioning activities.

In order to ensure the avoidance of significant effects and reduce the predicted magnitude and significance of effects to the greatest possible extent during the construction and decommissioning phases, the following mitigation measures will be implemented:-

- Traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00–13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours to avail of favourable weather conditions or during extended concrete pours. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- A wheel washing facility will be provided, as necessary, to prevent any debris being transferred from site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the project site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;
- A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Local Authority prior to the commencement of development. The Traffic Management Plan shall include inter alia confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;
- All works to the public road shall be undertaken in consultation with, and agreed in advance with, the relevant local authority;
- All reasonable steps shall be taken to ensure that only national and regional routes are used to transport all materials to the site, in so far as is possible;
- Prior to, and post, construction; pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures. Following the completion of the pre-construction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken, while any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the developer and to the satisfaction of the relevant local authority;
- Adequate signage shall be provided at entrances providing access, safety and warning information;
- Speed limit compliance; particularly along the local roads (including the

L300321 local road); will be emphasised to all staff and contractors prior to the commencement of construction during site induction, and will be strictly enforced throughout the construction phase;

- Sufficient car parking spaces will be available at the temporary construction compound[8] during the construction phase. Additionally, during construction of the proposed underground electricity line, it is likely that agricultural premises will be used for the temporary storage of materials (e.g. ducting, cabling, etc.) and for the parking of construction plant, machinery, and work vehicles (cars, vans, etc.). No parking of cars by persons associated with the project will be permitted on any part of the public road that is not closed to traffic. All staff will be instructed to ensure that private entrances remain unobscured (particularly along the underground electricity line route);
- Road sweeping, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions;
- Traffic restrictions shall be kept to minimum duration and extent;
- Appropriate traffic management; including maintenance of local access, pedestrian access (where safe to do so) and diversions (where required); shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan to be agreed with the Planning Authority prior to the commencement of development;
- The timing of oversized/abnormal loads shall be agreed with the relevant local authorities and An Garda Síochána, and all relevant licenses and permits shall be obtained in advance. All oversized/abnormal loads shall be accompanied by escort vehicles to ensure the maintenance of public safety;
- Maximum axle loadings for abnormal/oversized loads shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);
- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and the respective local authorities; and
- The site shall be closed, and strictly secured, to the public during the construction phase.

Likely effects during the operation phase have been assessed as being imperceptible and hence mitigation measures are not assessed as being required.

14.2.5.2 Monitoring

As described above; prior to and post construction, pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Following the completion of the pre-construction survey, any works (additional to those which have been identified and described at **Chapter 3**) which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken. Any deterioration of carriageways or structures identified in the post-construction survey shall be put right

[8] Permitted as part of Cush Wind Farm Phase I

at the expense of the Developer and to the satisfaction of the relevant local authority.

14.2.6 RESIDUAL EFFECTS

14.2.6.1 Construction Phase

There are no significant residual effects, positive or negative, assessed as likely to occur during the construction phase. Mitigation measures have been proposed to offset any likely adverse effects and any residual effects are assessed to be slight, negative and short-term. The residual negative effects are likely to arise as a result of accommodation works along the turbine delivery haul routes, increases in traffic volumes on local roads in the vicinity of the project site and direct construction activities along the local roads in the vicinity of the project site.

14.2.6.2 Operation Phase

There will be no significant residual effects during the operation phase as only occasional LGVs are envisaged as likely to visit the site during operation for routine monitoring and maintenance.

14.2.6.3 Decommissioning Phase

Decommissioning phase effects are assessed to be similar to those of the construction phase but of a reduced scale. In particular, the public road upgrades and improvements will be retained thus eliminating any likelihood of significant effects. Similarly, access tracks and some ancillary wind farm infrastructure is likely to be retained resulting in a reduction in vehicular movements associated with the decommissioning phase. Much of the site infrastructure, such as turbine foundations and crane hardstands, may simply be covered in topsoil and allowed to revegetate without removing the structures, which would significantly reduce the amount of vehicular movements during this phase.

14.2.7 SUMMARY

This section has assessed the likelihood of significant effects arising from the project on transport and access. The project has generally been assessed resulting in effects which are likely, slight-to-moderate, direct, indirect, negative (temporary), and positive (long-term). Following mitigation, the likely residual effects have been assessed as likely, imperceptible-to-slight, direct, indirect, negative (temporary), and positive (long-term).

Likely cumulative effects, with other developments in the vicinity, have been assessed as being of moderate-slight significance but short-term in nature. However, with the implementation of appropriate traffic management measures for the subject project, and the implementation of a similar measures in respect of Cush Wind Farm Phase I, the magnitude of effects can be substantially reduced and will not be significant.

Overall, this assessment has identified no likelihood of significant effects on transport and access which could arise as a result of the construction, operation or decommissioning of the project either individually or in combination with other existing, permitted or proposed developments.

14.3 AVIATION

14.3.1 INTRODUCTION

This section assesses the likelihood of effects on aviation arising from the construction, operation or decommissioning of the project. The requirement for an assessment of the likely effects on aviation is set in the *Wind Energy Development Guidelines for Planning Authorities 2006* which state:-

> *"The siting of wind turbines may have implications for the operations of communications, navigation and surveillance systems used for Air Traffic Control for the separation and safety of aircraft. Wind turbine siting may also have implications for the flight paths of aircraft."*

14.3.2 METHODOLOGY

The assessment involved consultation with various stakeholders including the Irish Aviation Authority (IAA) and Department of Defence. In addition, publications issued by the IAA and the Department were reviewed to determine if the project site was assessed as being of significance or if significant effects were likely. A desktop study was also undertaken to determine the presence of aerodromes or airstrips within 20km of the subject site.

This assessment has had particular regard to the *Draft Air Corps Wind Farm/Tall Structures Position Paper* (August 2014) (**Annex 14.1**) which sets out the Air Corps position on the appropriate siting and management of wind farms and tall structures. This assessment includes a detailed review of this position paper, a comparison of the project site with identified 'Danger Areas', 'Restricted Areas' and 'Low Level Flying Areas'.

14.3.3 CONSULTATION

Consultation was undertaken with the IAA and Department of Defence to establish if any effects on aviation were likely. A consultation letter was issued to both in January 2026 (see **Chapter 1**), which included a Preliminary Scoping Report, a general description of the project and site location drawings.

Correspondence received from the IAA (see **Annex 1.7**), advised that consultation was to be carried out with Birr Aerodrome Licensee: "Ormond Flying Club" so that they may assess the impact of the proposed development and any associated cranes that would be utilised during its construction to ensure there is no impact on the safety of aircraft operations at Birr Aerodrome. No response/comment was received in response to a consultation request sent to Birr Aerodrome in January 2026.

The Department of Defence responded on 30 January 2026 (see **Annex 1.7**), specifying obstacle-lighting requirements and advising that, in the event of negative impacts on future military radar systems, the owner would be required to engage with the Department and provide suitable mitigation as soon as practicable.

14.3.4 DESCRIPTION OF EXISTING ENVIRONMENT

There are no major airports in the vicinity of the project and the site is therefore assessed as being unconstrained. The proposed wind turbines are located c. 100km southeast of Ireland West (Knock) Airport, c. 82km northeast of Shannon Airport, and c. 110km west of Dublin Airport.

There are also a number of aerodromes, airfields, and airstrips located within 40km of the proposed wind turbines including:-

- Birr Airfield (Offaly) located c. 7km south;
- Spollens Airstrip, Tullamore (Offaly) located c. 27km northeast; and
- Limetree Airfield (Laois) located c. 40km east.

The project site is not located within any of the 'Danger' or 'Restricted' areas as identified at Annex A, B or C of the Draft Air Corps Wind Farm/Tall Structures Position Paper. The project site is located within a 'Military Operating' area (MOA 5) as defined in the Position Paper and per Section 2.b(2)(d) proposals for objects exceeding 45m in height above ground level must be referred to the Irish Air Corps for further assessment. As identified above, the Department of Defence (Irish Air Corps) was consulted and a response was received, see **Section 14.3.3** above.

The project site is not located within 3 nautical miles (c.5.5km) of any critical low level route, such as motorways, as identified at para. 2(2)(c) and illustrated at Annex D of the Position Paper. The nearest proposed wind turbine to the M6 and/or M7 motorway is located at a distance of c. 13.5 nautical miles (c.25km).

Air traffic control radar is of two types. Primary Surveillance Radar (PSR) equipment sends out pulses of electromagnetic energy which will reflect off objects in their path. The radar's receiver antenna detects the returning 'echoes' and these are displayed on the radar screen. The time taken for the pulse to travel out to the target and back gives an indication of the range of the object from the radar

Secondary Surveillance Radar (SSR) is the second type of radar equipment used for air traffic control. Like primary radar, SSR relies on an antenna rotating continuously through 360°. However the radar does not transmit raw pulses of energy; it transmits an interrogation signal. The signal is received at the SSR antenna, decoded, and the height and location of nearby aircraft are presented on the radar screen. This enables controllers to positively identify radar returns on their screens and (after verbal confirmation from the pilot) to confirm the aircraft's height.

Rotating wind turbine blades within radar range can impart a Doppler shift to any radar energy reflecting off the blades. The radar's processor could detect this as a non-static target and therefore display the turbines as objects on the radar screen.

14.3.5 DESCRIPTION OF LIKELY EFFECTS

14.3.5.1 Construction Phase

Due to the general low altitude of activity during the construction phase, it is assessed that there will be no likely impact on aviation. During the erection of wind turbines, cranes will be fitted with appropriate aviation warning lighting to alert pilots to the presence of tall structures. Likely effects are assessed to negative, indirect, imperceptible, and short-term.

14.3.5.2 Operation Phase

Following the completion of the construction phase, no significant effects are assessed as likely to occur. The installation of aviation warning lighting is inherent to the project design; and its operation during the operation phase will ensure that any civil and military aviation activities occurring within the vicinity of the project are sufficiently aware of the presence of the project.

It is concluded, therefore, that the operation of the project will not result in any likely significant effect on aviation, with effects being likely, negative, indirect,

imperceptible, and long-term (for the operation duration of the wind farm).

14.3.5.3 Decommissioning Phase

The likely effects during the decommissioning phase are assessed to be similar to those during the construction phase with no significant effects assessed as likely to occur. Likely effects are assessed to be negative, indirect, imperceptible, and short-term.

14.3.5.4 Switch Room & Underground Electricity Line

No significant effects on aviation are assessed as likely as a consequence of the construction, operation or decommissioning of the proposed switch room and underground electricity line. Infrastructure associated with the proposed underground electricity line will be underground, therefore there is no likelihood for effects on, or interactions with, aviation. The switch room will be a low-rise building with an overall height of approximately 6m and will not present an obstacle to aviation.

14.3.6 Cumulative Effects

Given the presence of other existing, permitted and proposed wind energy developments (tall structures) in the vicinity of the project, it is assessed that cumulative effects could occur. However, the implementation of aviation warning lighting is standard across all such developments and, consequently, cumulative effects are assessed to be likely, negative, indirect, imperceptible, short-term (construction & decommissioning phases), and long-term (for the operation duration of the wind farm).

Accordingly, significant effects are not likely to occur.

14.3.7 Mitigation & Monitoring Measures

14.3.7.1 Construction Phase

Due to the absence of likely effects, there are no specific mitigation measures proposed during the construction phase. As requested by the IAA in its consultation response, a minimum of 30-days prior notification will be provided regarding the commencement of crane operations at the project site. Additionally, as is best practice and implemented as standard, warning lights will be fitted to cranes during the erection of the wind turbines.

14.3.7.2 Operation Phase

The proposed wind turbines will, as requested by the IAA in their consultation response and implemented as standard, be fitted with aviation warning lighting in accordance with specification to be agreed with the IAA and the Planning Authority prior to the commencement of development.

At a maximum of 30-days following the installation of all proposed turbines, 'as-constructed details' will be provided to the IAA to allow for the updating of mapping charts, including:-

- The number of wind turbines;
- WGS-84 coordinates of each turbine;
- Ground elevation of each turbine (Malin Head OD);
- Blade tip elevation of each turbine (Malin Head OD);
- Height of Turbine;

- Contour maps at the requisite scale; and
- A note of which turbines have been fitted with obstacle warning lights.

In the event that the obstacle warning lights fail or if there are plans to withdraw them from use for a period of time, the IAA will be contacted, via AISOPs@iaa.ie, as a matter of urgency, to request that a NOTAM (Notice to Airmen) is issued concerning the absence of obstacle lighting. The following information will be provided to the IAA:-

- Obstacle ID;
- Obstacle type;
- Obstacle Position;
- Elevation; and
- Colour of Light.

It should also be noted, however, that the proposed wind turbines will be fitted with an uninterruptable power supply (UPS) to ensure that the aviation warning lights remain operation even in the event of a power outage. This UPS is sufficient for a period of 12-hours; after which, the warning lights can be powered by a small generator should the power outage continue.

The aviation warning lighting will also comply with the Department of Defence requirements specified in its response of 30 January 2026 (**Annex 1.7**).

In the event that the development causes negative impacts on future military radar systems, the owner will engage with the Department of Defence and provide suitable mitigation as soon as practicable.

14.3.7.3 Decommissioning Phase

Mitigation measures proposed during the construction phase will also be implemented during the decommissioning phase.

14.3.7.4 Switch Room & Underground Electricity Line

Given that no significant effects are assessed as likely to occur as a result of the construction, operation or decommissioning of the proposed switch room and underground electricity line, no specific mitigation measures are proposed, or required.

14.3.8 Residual Effects

No significant residual effects are assessed as likely to occur.

14.3.9 Summary

This assessment concludes that the project is unlikely to result in any significant effect on aviation. The project site, whilst located within an area identified as being a 'Military Operating' area by the Department of Defence, is not located within the more sensitive 'Danger' or 'Restricted' areas or a critical low level route identified within the *Draft Air Corps Wind Farm/Tall Structures Position Paper* on military aviation. Accordingly, with the installation of appropriate aviation warning lighting and the implementation of appropriate mitigation measures, no significant effects are assessed as likely to occur. Therefore, it is assessed that significant effects on aviation are unlikely to arise as a result of the project, either individually or in combination with other existing, permitted or proposed developments.

14.4 TELECOMMUNICATIONS

14.4.1 INTRODUCTION

As noted in the *Wind Energy Development Guidelines for Planning Authorities 2006*[9], wind turbines, like all electrical equipment, produce electromagnetic radiation, and this can interfere with broadcast communications. This section considers the likely effects of the project upon a range of communications infrastructure, including telecommunications networks, broadcast radio and television and fixed infrastructure such as telecommunication masts. In theory, interference could affect all electromagnetic communications including:-

- Satellite Communications;
- Cellular Radio Communications; and
- Television Broadcasting Signalling.

14.4.2 METHODOLOGY

The methodology employed in assessing the likelihood of significant effects on telecommunication networks consisted of desk based research[10] and consultation with various telecommunication companies and relevant authorities. Desk based research was undertaken to identify:-

- Locations of known telecommunications facilities;
- Known telecommunication fixed links; and
- Known television broadcast and re-broadcast facilities.

During the EIAR scoping process (see **Chapter 1**), the following telecommunication service providers and authorities were consulted with;-

- Airspeed Telecom;
- AirNav Ireland;
- An Garda Síochana;
- Ajisko Limited;
- BT Communications Ireland;
- Coimisiún na Mean;
- Commission for Communications Regulation;
- Eir Mobile;
- Eirgrid PLC;
- Enet Telecommunications Networks Limited;

[9] And acknowledged in the *Draft Revised Wind Energy Development Guidelines 2019*
[10] https://siteviewer.comreg.ie/

- ESB Networks;
- Imagine Group;
- Irish Aviation Authority;
- JFK Communications Limited;
- Magnet+;
- National Ambulance Service;
- Netshare Ireland;
- Open Eir;
- Radio Services and Building Ltd;
- Ripplecom;
- 2rn (RTE Transmission Network Ireland);
- Tetra Ireland Communications Ltd;
- Three (3) Ireland;
- Towercom;
- Viatel Ireland Ltd
- Virgin Media Ireland; and
- Vodafone Ireland Ltd.

In addition to the above, and as discussed in **Chapter 1**, it was established that the project site was located c. 6km from the Irish Low Frequency Array (I-LOFAR) system. The proposed wind farm (turbines) are located further than 6km from the closest point of the I-LOFAR.

I-LOFAR consists of 12 international stations in Germany, Poland, France, UK, Sweden and Ireland, with additional stations and a central hub in The Netherlands, operated by the Netherlands Institute for Radio Astronomy. I-LOFAR is the Irish addition to this network and is located within the grounds of Birr Castle, immediately west of Birr, County Offaly. Given the proximity of the project to I-LOFAR, consultation was also carried out with the I-LOFAR consortium.

The responses received from these organisations are summarised at **Chapter 1** and can be viewed at **Annex 1.7**.

14.4.3 Description of Existing Environment

The desktop research and consultations undertaken confirmed that while there is telecommunications infrastructure located in the wider vicinity of the project site and there are microwave, and other, links present, the project site is not a strategically important location for telecommunication links.

2rn (RTE Transmission Network) advised of the existence of an off-air link passing c. 1200m away from the project site and that they had no concerns. Additionally, they referred to the signed protocol agreement which is already in place between the developer and 2RN. The existing protocol arrangement will ensure the appropriate remediation of any adverse effects which may be experienced.

ESB Networks in their consultation response outlined that any proposed wind turbine within their exclusion zone would require further detailed coordination in order to avoid interference or degradation of the ESB link.

14.4.4 DESCRIPTION OF LIKELY EFFECTS

14.4.4.1 Construction Phase

No significant effects are assessed as likely to occur during the construction phase.

14.4.4.2 Operation Phase

Interference of Wind Turbines with Electromagnetic Transmissions

The operation of wind turbines can affect electromagnetic transmissions in two ways: by blocking or deflecting line of sight radio or microwave links or by 'scattering' transmission signals. However, given the findings of the desk based survey and consultation process, significant levels of blocking, deflecting or scattering are not assessed as likely to arise.

The ESB consultation response has identified that any wind turbine within their exclusion zone will require further detailed assessment in order to avoid interference or degradation. The developer will continue to consult with ESB to ensure that interference and degradation of any ESB link does not occur.

Analogue and Digital Television Signals

The United Kingdom's Office of Communications (OFCOM) document *Tall structures and their impact on broadcast and other wireless services*[11] provides an overview for developers and planning authorities on how tall structures such as wind turbines may affect reception of wireless services.

There are two potential problems that can occur due to interference from tall structures: (1) signal blocking, and (2) reflection. Signal blocking can occur when a tall structure is situated between the transmitter and receiver. This causes a shadow behind the structure that can reduce signal levels. The severity of the reduced signal can vary depending on a number of factors such as the height of the structure.

Signal reflection can occur when wireless signals are reflected from the sides of structures. In the case of wind turbines, because the blades are rotating, the reflections can fluctuate and be quite complex. Reflections from turbines can also vary depending on the speed at which the blades are rotating and the angles of the blades. According to OFCOM, digital television signals are much better at coping with signal reflections, and pictures do no experience ghosting.

As analogue television has been phased out in Ireland, problems with ghosting and signal reflection due to interference from turbines will be reduced. The digital television signal is much better at coping with signal reflection. Since the digital switchover, the power of transmitters emitting the digital signal has been increased to deal with the demand. This higher output is likely to overcome any signal interference and is not likely to effect the reception received on televisions. Overall, the likely extent of any potential problems is much less significant with digital television than with analogue television.

While 2rn have confirmed that they are content, it has been identified that there is a risk of interference to local digital terrestrial television viewers in the vicinity of the project. While any effects may be significant on an individual or residential basis; in

[11] OFCOM: Tall structures and their impact on broadcast and other wireless services, August 2009, http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/wind-farms/tall_structures.pdf

EIA terms, effects are assessed to be indirect, negative, slight, and long-term.

Mobile Phone & Broadband Signals

Notwithstanding the presence of a number of telecommunication (mobile phone & broadband) masts in the wider area, the consultation process has not identified the likelihood for significant interference to occur.

Irish Low-Frequency Array (I-LOFAR)

Whilst a consultation response was not received from I-LOFAR, owing to the proximity of I-LOFAR to the project site, it was considered appropriate to commission a specific Radio Telescope Impact Assessment (RTIA) in order to ascertain the significance and likelihood of effect on the frequency array, see **Annex 14.2**. The applicant commissioned Pager Power; a specialist consultancy based in Suffolk, U.K; to carry out the RTIA and the report was sent to I-LOFAR in March 2026 for comment. To date there has been no response from I-LOFAR.

The potential impacts of the wind turbines on I-LOFAR arise primarily due to the following three mechanisms:

1. Obstruction of signals from space by the turbines as physical structures;
2. Reflections of existing terrestrial sources of noise (such as television transmissions); and
3. Radio frequency emissions from the turbines themselves.

Based on assessment of these primary mechanisms within the RTIA, the proposed development is not predicted as likely to have a significant impact on I-LOFAR.

The RTIA, see **Annex 14.2**, concludes the proposed wind turbines, as obstructions, will very slightly reduce the minimum horizon of the I-LOFAR antennae. The elevation angle from the antennae to the turbine tip ranges from approximately 1.6 degrees to 2.4 degrees, an increase of less than 1 degree compared to the current maximum obscuration from the terrain. The presence of the turbine will therefore have a technical impact on the lowest unobscured angles; however, the change is small and likely to be insignificant because the elevation angles required for actual astronomical data are likely to be larger than the angle to the turbine blade tips.

Based on the typical radio frequency emissions emitted from the turbines, field calculations of extrapolated field values for the nearest turbine indicated values of up to 20.0 dBμV/m (decibels voltage level referenced to 1 microvolt per metre). Emissions from the turbines are therefore not predicted as likely to be significant because the emissions are small, due to their compliance with International Electrotechnical Commission standards, and because they reduce significantly with distance. Any emissions from the turbines will therefore be significantly smaller than emissions from closer sources, such as vehicles, mobile phones, buildings, machinery, home appliances, etc. in and around Birr. On the basis of the finding summarised above, and included in full within the RTIA, the likely effects are assessed as not likely to be significant and to be indirect, slight, negative and long-term.

14.4.4.3 Decommissioning Phase

No significant effects are assessed as likely to occur during the decommissioning phase.

14.4.5 CUMULATIVE EFFECTS

Although the RTIA predicts no significant effects on I-LOFAR, potential cumulative effects with other tall structures in the wider landscape have also been considered. In particular, significant effects could potentially arise in respect of the operation of I-LOFAR in combination with the permitted Cush Wind Farm Phase I and the operational Derrinlough, Cloghan and Meenwaun wind farms. Given that the RTIA assesses the combined eleven turbines of Cush Wind Farm Phases I and II and predicts no significant impact, and that the operational wind farms are located at a distance further away to I-LOFAR than those within the project site, it is assessed that any cumulative effects arising from the project, in combination with other existing, permitted and operational developments, are assessed as not likely to be significant; effects may arise and are assessed to be slight-negative and long-term.

14.4.6 MITIGATION & MONITORING MEASURES

14.4.6.1 CONSTRUCTION PHASE

As significant effects are not assessed as likely to occur during the construction phase, no specific mitigation measures are proposed.

14.4.6.2 Operation Phase

In its consultation response, 2rn confirmed that a protocol agreement was already in place with Cush Wind Limited, the applicant and developer for Cush Wind Farm Phase II. The signed protocol covers the Phase II development and provides for the investigation and appropriate remediation of any interference to television reception attributable to the development, including the management of complaints received from members of the public. A signed copy of the protocol, together with the 2rn consultation response confirming its applicability, is enclosed at **Annex 14.3**.

While assessed to be unlikely, if significant signal interference in any form is identified and is directly attributed to the project, appropriate remedial measures will immediately be undertaken. A range of technical measures are available to mitigate any instances of interference including signal amplifiers, active deflectors and relay transmitters, repeater stations, booster units, realignment of domestic aerials, installation of higher quality aerials and the installation of suppression equipment. Remedial works will be promptly undertaken, at the Developer's expense, to ensure uninterrupted telecommunication, broadcasting and mobile phone service provision.

14.4.6.3 Decommissioning Phase

As no significant effects are assessed as likely to occur during the decommissioning phase, no specific mitigation measures are proposed or required.

14.4.7 RESIDUAL EFFECTS

No likely significant residual effects are assessed as likely to occur.

14.4.8 SUMMARY

It can be concluded that, on the basis of this desktop assessment, the extensive consultation with stakeholders, and the Radio Telescope Impact Assessment, the project will not result in any likely significant effects on the telecommunications network. The implementation of mitigation measures will ensure that possible identified

effects on telecommunication signals or links are appropriately managed and mitigated. Therefore, it is assessed that significant effects on telecommunications are unlikely to occur as a result of the project, either individually or in combination with other existing, permitted or proposed developments.

14.5 RESOURCES & UTILITY INFRASTRUCTURE

14.5.1 INTRODUCTION

This section provides an assessment of the likelihood of significant effects on, or interactions with, existing renewable and non-renewable resources, and other utility infrastructure. Within the wider environs of the project site there is evidence of the extraction and use of resources; particularly cutaway and cutover peat extraction, and quarries.

There is also the presence of utility infrastructure, with overhead electricity cables connecting to dwellings; medium and high voltage electricity transmission lines traversing the landscape; and other suspended telecommunication wires adjacent to the majority of local roads..

14.5.2 DESCRIPTION OF EXISTING ENVIRONMENT

14.5.2.1 Renewable Resources

The 2013 Sustainable Energy Association of Ireland (SEAI) Wind Speed Atlas identified the project site as having an average wind speed of 6.5m/s at 50m height. An existing meteorological mast has been measuring wind speed at the project site since March 2022 and has, to date, recorded a mean wind speed of c. 7.3m/s, extrapolated to 114m i.e. the hub height for the dimension range scenario which represents the maximum development footprint (see **Section 1.8.3, Chapter 1**).

In the context of this available renewable wind resource, there are currently 9 no. operational wind farms across County Offaly[12]; including Meenwaun, Derrinlough, Cloghan, Leabeg, Moanvane, Mount Lucas, Cushaling, Yellow River and Cloncreen Wind Farms.

14.5.2.2 Non-Renewable Resources

The environs of the project site, and the wider midlands region more generally, is notable for its lowland peatland bogs and has a significant industrial heritage of cutaway peat extraction for power generation, including a number of now inoperative thermal power stations, and the extraction of peat for domestic (briquettes) and horticulture use. As a consequence, there is a significant legacy of electricity grid infrastructure in the wider environs of the project site. Cutover peat

[12] Source: https://gis.seai.ie/wind/

extraction for private domestic use is also prevalent, including within the project site.

As peat extraction is now gradually being phased out for ecological and climate change reasons, non-renewable energy production from peat extraction is gradually being replaced with renewable energy production, particularly wind, as described above, and, more latterly, solar energy. There are also a significant number of extant quarrying activities within the wider environs of the project site. Specifically, there are several disused quarries to the immediate south of the project site together with one operational quarry and associated concrete batching plant (Loughnane Concrete). Despite the existence of quarries within its immediate environs, initial site investigation works on the project site have not encountered any significant levels of rock. As discussed in **Section 14.2.3.2** above, it is anticipated that local quarries will be utilised for the importation of stone aggregates during the construction phase of the project. The precise source of such materials will, however, be selected during the pre-construction procurement process and a range of alternative possible sources are presented at **Chapter 2.** An assessment of the likely significant traffic and transport effects of the importation of such materials during the construction phase is provided at **Section 14.2**.

14.5.2.3 Utilities Infrastructure

The electricity transmission network in County Offaly predominately comprises 38kV and 110kV electricity transmission lines, with higher voltage 220kV and 400kV lines also present. Lower voltage distribution lines in this part of rural County Offaly generally connect individual properties to the transmission network. As discussed above, there is a significant legacy network of electricity grid infrastructure in the wider environs of the project site due to historic power generation from cutaway peat extraction.

EirGrid is the transmission system operator (TSO) responsible for both the planning and operation of Ireland's high voltage national grid (≥110kV) while ESB Networks are responsible for the development of medium and low voltage lines (≤38kV).

In addition to the microwave-telecommunications network discussed at **Section 14.4** above, there is an extensive physical telecommunications network in the wider environs of the project site with poles and wires running along the majority of local and regional roads; while local services such as water schemes (public and group schemes) and local authority roadside drainage infrastructure is also present along local roads.

14.5.3 Description of Likely Effects

14.5.3.1 Construction Phase

The construction phase of the project is not likely to have any significant effect on existing renewable or non-renewable resources, or utilities infrastructure. The construction phase will not inhibit the export of renewable energy generated from other sources, inhibit the development of other renewable energy projects, nor will it affect existing utility services. While there is a potential for effects on utility services (e.g. accidental collision with overhead wires or sub-surface cables/pipes during the construction phase), this can be mitigated through good construction practices.

During the process of connecting the project to the national grid, some minor, temporary disruption to electricity supply, at a local level, could occur.

The construction phase will require the extraction of non-renewable resources in the

form of stone aggregates for the construction of access tracks, hardstands and backfilling of underground electricity line trenches etc. together with concrete for turbine foundations. All such construction materials, which are not reused from on-site excavations, will be sourced, where possible, from local quarries and, specifically, only those which are appropriately authorised quarries operating within their permissions. Accordingly, the likely significant environmental effects of this extraction have previously will have been fully assessed by the applicable competent authority.

Construction activities associated with the completion of turbine delivery haul route accommodation works are not assessed as likely to impact on resources or utility infrastructure. Where an effect could potentially occur; e.g. utility infrastructure proximate to alteration works along the proposed turbine delivery haul route; appropriate best-practice construction methods will ensure no likely significant effect.

As a result, it is assessed that significant effects on resources and utility infrastructure are unlikely to occur as a result of the construction phase, either individually or in combination with other existing, permitted or proposed developments; with likely effects assessed as being slight-imperceptible, direct, indirect, and short-term.

14.5.3.2 Operation Phase

The operation phase of the project will not result in any likely significant effect on existing utility infrastructure or renewable or non-renewable resources.

It may be necessary to occasionally import stone aggregates and other such materials to the project site during the operation phase to maintain access for service vehicles; however, materials will again be sourced from authorised quarries with full planning permission and no likely significant effects will occur.

The project will have no likely operation phase effects on existing renewable resources. It is further assessed that the project will enhance the use of renewable resources for energy production, replacing the former non-renewable energy production from peat extraction in the wider environs, and have a likely overall positive effect in terms of carbon reduction and climate change (see **Chapter 9**).

Likely effects during the operation phase are therefore assessed to be imperceptible, direct, indirect, and long-term. It is assessed, therefore, that significant effects on the environment are unlikely to occur in respect of resources and utility infrastructure during the operation phase, either individually or in combination with other existing, permitted or proposed developments.

14.5.3.3 Decommissioning Phase

No significant effects are assessed as likely to occur during the decommissioning phase in respect of resources and utility infrastructure.

14.5.3.4 Switch Room & Underground Electricity Line

The construction, operation, and decommissioning of the switch room and underground electricity line will not result in any likely effect on existing utility infrastructure or renewable or non-renewable resources. The project will increase renewable electricity generated without resulting in any likely significant adverse effects on resources or utility infrastructure.

CUMULATIVE EFFECTS

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

14.5.4 MITIGATION & MONITORING MEASURES

CONSTRUCTION PHASE

As identified above, accidental collision with overhead wires, sub-surface cables/pipes and/or forestry will be mitigated through the implementation of good construction practice and procedures.

The sourcing of aggregates locally and from facilities which have been subject to EIA, will mitigate against the likelihood of significant effects during the construction phase.

Additionally, during the process of connecting the project to the national grid, EirGrid will balance the loading on the network to ensure that no significant disruption occurs, and likely significant effects do not arise.

OPERATION PHASE

No specific mitigation measures are proposed or required during the operation phase.

DECOMMISSIONING PHASE

No specific mitigation measures are proposed or required during the decommissioning.

14.5.5 RESIDUAL EFFECTS

No likely significant residual effects are assessed as likely to occur.

14.5.6 SUMMARY

This assessment concludes that the project is unlikely to result in any likely significant adverse effect on renewable and non-renewable resources or on utilities infrastructure. The operation of the project will result in a likely significant positive effect in terms of electricity generated from renewable sources. This assessment similarly concludes that the project is unlikely to result in any significant adverse cumulative effects on resources or utility infrastructure in combination with existing, permitted or proposed developments.

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