

12 MATERIAL ASSETS AND OTHER ISSUES

12.1 INTRODUCTION

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

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

Common acronyms used throughout this EIAR can be found in **Chapter 1: Introduction, Appendix 1.2**.

This chapter of the EIAR is supported the following Appendices in Volume IV:

- **Appendix 12.1** TLI Group- Grid Route Feasibility Report

12.2 STATEMENT OF AUTHORITY

This section has been prepared by Mr. Ryan Mitchell and Mr. Justin Lohan of Jennings O'Donovan & Partners Ltd. Mr. Mitchell has a Bachelors' Degree in Animal conservation and Biodiversity, has a strong proven background in ecology with 5 years' of experience working in the sector. He is experienced in report writing, EIAR chapter writing and project management working on EIARs for wind farm developments in Ireland.

Mr. Lohan has a Bachelors' degree in Environmental Science and Technology. He also has almost 20 years' experience working in the construction and environmental sectors. He is experienced in report writing, EIAR chapter writing and project management working on EIARs for wind farm developments in Ireland.

The chapter has been reviewed by Mr. David Kiely of Jennings O'Donovan & Partners Ltd. Mr. Kiely has 35 years' experience in the civil engineering and environmental sector. He has obtained a Bachelor's Degree in Civil Engineering and a Masters' in Environmental Protection, has overseen the construction of over 40 wind farms and has carried out numerous soils and geology assessments for EISs. He has been responsible in the overall preparation of in excess of 20 EIA Reports (EIARs).

Further details and biographies/CVs of those involved in the development of each chapter have been included in **Chapter 1: Introduction** (Section 1.10).

12.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Following preliminary consultations with key consultees during the scoping process, desk-based assessments, site visits and field surveys were undertaken. In line with the EIA Directive 2011/92/EU as amended by EIA Directive 2014/52/EU and current EPA Final Guidelines (2022), this chapter of the EIAR aims to focus the assessment solely on those elements likely to have a significant effect on the environment. Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are addressed in **Chapter 8: Soils and Geology**, **Chapter 9: Hydrology and Hydrogeology**, and **Chapter 16: Air and Climate**. Peat and spoil are assessed in **Chapter 8: Soils and Geology**. Amenity resources and tourism are addressed in **Chapter 5: Population and Human Health**. The cultural assets of Archaeology and Cultural Heritage are addressed in **Chapter 13: Cultural Heritage** and traffic is addressed in **Chapter 14: Traffic and Transportation**. Utilities such as water, wastewater and waste services are addressed in this chapter and in **Chapter 2: Development Description**.

The material assets considered in this chapter include:

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

12.4 LAND USE - AGRICULTURE

12.4.1 Baseline Environment

The Site, located c.14km North of Dungarvan, is characterised as being generally improved grassland and upland heathland landscape which is currently being used for intensive agriculture, forestry and livestock grazing. There are also a number of residential properties in a one-off settlement pattern and established wind farms in the region. The Development as a whole is characterised by elevation of between 150m and 430m AOD and a spatial area of approximately 450.9ha.

The agricultural land is predominantly utilised for cattle grazing, sheep grazing and silage. The commercial forestry is mainly made up of Sitka Spruce and is further detailed in **Appendix 2.2**.

12.4.2 Assessment of Potential Effects

The total land-take of the Development, including the Site Access Roads, Turbine Hardstands, Turbine Foundations, Grid Connection Route, Turbine Delivery Route nodes and sub-station is 18.6 hectares. The Site is 463 hectares; therefore, the total land take is 4% of the Site. The proposed Site Access Roads and upgrade to existing roads will improve access for surrounding agricultural use.

The construction, operational and decommissioning phase of the Development will result in a change of 16.1 hectares of agricultural use in areas where new Site Access Roads, wind turbine bases, hardstanding areas, Permanent Met Mast, the onsite 110kV Substation Control Buildings and associated drainage infrastructure will be located.

The construction of the Grid Connection Route and Turbine Delivery Route will only require relatively localised excavation works within and adjoining the public roads. Some works are required in private lands and incorporated in the Redline Boundary.

There will be twelve turbines located on or partly on agricultural lands. This will result in the change of use of some agricultural pastureland to wind farm use. This will have a long-term slight, negative impact on agricultural land use due to the removal of grazing lands for the duration of the Project during construction and operation phases.

The approach proposed for decommissioning is one of minimal intervention:

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

Therefore, the effects of the decommissioning phase on agriculture will be less than those during the construction phase and not significant.

12.4.3 The 'Do-Nothing' Impact

If the Development does not proceed, lands within in the redline boundary of the site will continue to be used for agricultural purposes. This would have a neutral effect.

12.4.4 Mitigation Measures and Residual Effects

Mitigation measures to minimise impacts on agricultural land use have been incorporated into the pre-planning design stage. The construction and operational footprint of the Development has been kept to the minimum necessary to avoid impact on existing land uses and existing roads and tracks serving agricultural and forestry use have been used where possible.

These mitigation measures will allow for the prevention of unnecessary or inappropriate ground works or land use alterations to occur and will avoid unnecessary soil compaction.

Implementation of the measures outlined above will ensure that residual impacts will be slight negative for the duration of the construction and operational lifespan of the Project.

There are no adverse residual impacts predicted, with respect to land use, arising from the operational phase of the development.

All existing access points (i.e., to domestic premises, business, farms) are accessible during temporary road closures and diversions. This is to maintain local access and avoid impacts on other various land uses. **Chapter 14: Traffic and Transportation** refers to all proposed works and deliveries along the turbine delivery route to avoid undue impact to adjacent land uses. This is also considered for the decommissioning phase for which traffic will be required along the Construction Haul Route. The Turbine Delivery Route will no longer be needed. This is further detailed in **Chapter 2: Development Description**. Thus, the residual impact on surrounding agricultural land uses is negligible during construction, operation and decommissioning.

12.4.5 Cumulative Effects

Due to the localised nature of the proposed construction/decommissioning works, there is no potential for significant cumulative effects in-combination with other local developments on the agricultural land use as apart from some small sections of the Turbine Delivery Route, all effects are directly within the Site.

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

Land management practices in the wider area which are considered to have potential for cumulative effects with the Project are agriculture and forestry. All existing and approved projects in **Table 2.1, Chapter 2: Development Description** were considered. There are no applications for large-scale commercial or industrial activities near the Site. Minor domestic and agricultural development will not introduce potential for cumulative effects during the construction, operational or decommissioning phases as the impacts will be localised and not significant.

The nearest wind farm is located 3.5km to the Northeast of the Development (Tierney Single Turbine). Surrounding agricultural activities can and will continue during the construction, operational and decommissioning phases of the Development when fencing has been fully established.

12.4.6 Statement of Significance

No significant impacts are predicted on agricultural land use.

12.5 LAND USE - FORESTRY

12.5.1 Baseline Environment and Description of Development

Permission is being sought by The Developer for the construction of 12 No. Wind Turbines, a Permanent Meteorological Mast, an on-site 110kV substation, and all ancillary works, works along the Turbine Delivery Route and the construction of an underground Grid Connection Route to Dungarvan 110kV substation, Co. Waterford. A full description of the Development can be found in **Chapter 2: Development Description**.

The Site contains approximately 66.7 hectares of forestry, the majority of which would be classified as commercial forestry. The proposed windfarm infrastructure layout (i.e., Access Tracks, Turbine Hardstands, etc.) affects forestry and 5 No. turbines are located within forestry or sufficiently near forestry as to require felling of forestry. A summary of the forestry affected is provided in **Table 13.1a**.

Table 13.1a: Summary of Removal of Forestry to facilitate The Development

Infrastructure	Area of forestry lost (Ha)	Species present
Turbines 4, 5, 6, 8, 9	7.85	Sitka spruce / Additional Broadleaves
Access Roads	0.04	Sitka spruce / Additional Broadleaves
Totals	7.89	

Detailed consideration of the approach to afforestation requirements associated with the Project is attached in **Appendix 2.2**. It should be noted that the clear-felling of trees in the State requires a felling licence. The associated afforestation of alternative lands equivalent in area to those lands being permanently clear felled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. The developer commits to not commencing the Project until both felling, and afforestation licences are in place. This ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

12.5.2 Assessment of Potential Effects

The Development will result in the removal of 7.89 hectares (11.8%) of the overall total area of 66.7 hectares of commercial forestry lands within the Site. However, the areas being removed should not have a significantly negative impact on the existing remaining forestry land use during the construction, operation and decommissioning of the Development. Commercial forests have specific lifespans when managed within a silvicultural rotation. Harvesting activities, if carried out at the correct time using proposed mitigation measures, which are outlined in the forestry assessment report **Appendix 2.2**, may not leave any significant impact on the surrounding forestry. The footprint of the wind farm infrastructure (Turbine foundations, hardstands, and access tracks) within the commercial forestry lands on site will have a slight negative impact on the existing forestry land use during the construction, operation and decommissioning of the Development.

12.5.3 The 'Do-Nothing' Impact

If the Development does not proceed, lands within and in the vicinity of the Site will continue to be used for forestry and agricultural purposes. This would have a neutral effect.

12.5.4 Mitigation Measures and Residual Effects

Where possible existing forestry tracks have been incorporated into the design to minimise the construction of new Site Access Tracks and minimise the removal of forested areas. New Site Access Tracks have been designed to minimise impact on forestry. Electricity cables will be installed underground in or alongside Site Access Roads to avoid and minimise negative impact. Utilising existing access roads will provide some positive impact for forestry, as they will reduce timber forwarding distances, which in turn will save some fuel consumption and reduce soil impacts.

The impact on land take during construction/decommissioning is likely to have a slight, negative impact on the forestry. Turbine foundations and hardstands occupy very little area and as such they have an insignificant impact on the forestry land. Implementation of the measures outlined above will ensure that any residual impacts will be insignificant with at most slight negative impact and short term in duration.

The construction and decommissioning works will be planned and managed by a Construction and Environmental Management Plan (CEMP) **Appendix 2.1**. This provides details on day to day works and methodologies. As part of these works, the public and other stakeholders will be provided with updates on construction activities which will affect access to surrounding lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the construction period.

During the operational phase, the impact on forestry land take is likely to have a slight negative permanent impact on the environment of the area (in that it alters the character of the environment); however, this change is consistent with existing and emerging trends. There are no predicted residual impacts, with respect to forestry land use, arising from the operational phase.

12.5.5 Cumulative Effects

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

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

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

12.5.6 Statement of Significance

No significant impacts are predicted on commercial forestry outside of the Site.

12.6 TELECOMMUNICATIONS

Microwave links need an unobstructed line of sight from end to end because blocked links will perform inadequately. It is therefore necessary to ensure wind turbines will not interrupt links. Impacts can include reflection, diffraction, blocking and radio frequency interference.

During operation, wind turbines have the potential to interfere with electromagnetic signals passing above the ground due to the nature and size of the wind farm.

Ireland saw the roll out of Digital Terrestrial Television, locally known as Saorview TV, in October 2010, incorporating the switchover from analogue to digital television. According to Ofcom (a regulatory UK body) (2009), *digital television signals are much better at coping with signal reflections, and digital television pictures do not suffer from ghosting*¹. Ghosting is the replica of a transmitted image which is offset in position and is superimposed on top of the main image.

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

12.6.1 Guidance

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

- Waterford City and County Development Plan, 2022-2028
- 'Best Practice Guidelines for the Irish Wind Energy Industry', published by the Irish Wind Energy Association (2012).

¹ Ofcom (2009) *Tall Structures and Their Impact on Broadcast and Other Wireless Services*, OFCOM, United Kingdom. Available online at: https://www.ofcom.org.uk/data/assets/pdf_file/0026/63494/tall_structures.pdf [Accessed: 09/03/2023]

- Information about Electric & Magnetic Fields and the Electricity Transmission System in Ireland, EirGrid²
- Wind Energy Development Guidelines: Planning Guidelines, Department of Environment, Heritage and Local Government (DHPCLG) 2006³
- Draft Revised Wind Energy Development Guidelines, Department of Housing, Local Government and Heritage (2019)⁴

12.6.2 Scoping and Consultation

Telecommunications providers were consulted about the Development. A summary of responses is outlined in **Table 13.2** and **Appendix 1.1** outlines full consultation responses.

Table 13.2: Summary of Consultations

Consultee	Response Date	Response
RTÉ Donnybrook Dublin 4 (2RN is the trading name of RTÉ Transmission Network DAC)	11/04/2022	<i>There is however a risk of interference to DTT viewers to the north east of the site receiving from our site in Dungarvan. We would therefore request that a protocol be signed between the developer and 2rn should the site go ahead.</i>
Eir Limited 2022 Bianconi Avenue Citywest Business Campus Dublin 24 D24 HX03	19/04/2022	<i>We have no transmission links within the proposed area and it has no risk to the network.</i>
Vodafone Netshare Ireland Iveagh Buildings Carrickmines Dublin 18	14/04/2022	<i>I can see no impact to any current Vodafone infrastructure with this planned development. Should any turbine locations, or size change, please let us know, and we can recheck.</i>
Tetra Ireland	19/04/2022	<i>We anticipate no impact from the development as proposed.</i>
Three Ireland	09/07/2021	<i>I have reviewed the turbine locations for the proposed Dyrick Hill windfarm and 3Ireland have no microwave transmission links that traverse the area, or that could potentially be affected.</i>
ENET	17/07/2021	<i>This wind farm won't affect our current network</i>

² Eirgrid (2014) *Information on Electric and Magnetic Fields*. Available online at : <https://www.eirgridgroup.com/site-files/library/EirGrid/Information%20on%20Electric%20and%20Magnetic%20Fields.pdf> [Accessed: 09/03/2023]

³ Department of Housing, Planning, Community and Local Government (2006) *Planning Guidelines*. Available online at: <https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/> [Accessed 09/03/2023]

⁴ Department of Housing Local Government and Heritage (2019). Available online at: <https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/#:~:text=The%20draft%20Guidelines%20now%20being%20issued%20for%20public,Draft%20Revised%20Wind%20Energy%20Development%20Guidelines%20December%202019> [Accessed 09/03/2023]

12.6.3 Assessment Methodology

Consultation with telecommunications operators was initiated during the scoping phase of this EIA to identify any potential microwave or telecommunication links that could be affected by the Development. Details of the Development were shared with link operators. Responses from Three and Eir indicated links in the vicinity of the Development.

RTÉ indicated a potential for impacts to the broadcasting service in the area and requested that they be notified should the Development progress.

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

12.6.4 The 'Do-nothing Impact'

If the Development does not proceed, there will be neutral impacts on telecommunications. This 'do-nothing' scenario would result in no interference in electromagnetic signals subject to the continuation of current activities and practices.

12.6.5 Construction Phase

During the construction phase, there are likely to be several sources of electromagnetic emissions (1) TV/radio (2) microwave (3) telecommunications. Chief among these will be the brief use of electrical power tools and the use of electrical generators which may be brought onsite before mains electricity is provided. These devices are required by Irish and European law to comply with the EMC Directive 2014/30/EU, as amended. Compliance with this Directive will mean that the electromagnetic emissions from these devices will not cause interference to other equipment.

Other potential effects during the construction phase are likely to be as a result of tall cranes used for constructing the turbines. These cranes will be beside the proposed turbines. Any interference effects are likely to be similar to those arising during the operational phase of the Development. This is further detailed in the CEMP **Appendix 2.1**.

12.6.6 Operational Phase

The turbine and sub-station control electronics will be typical of any circuits used by industry or a conventional generating station. In the operational phase, all electrical components, equipment, apparatus and systems will be required by Irish and European law to comply with the EMC Directive 2014/30/EU, as amended. Compliance with this Directive will mean that the electromagnetic emissions from these devices will not cause interference to other equipment and electromagnetic emissions from these devices will be well below those specified in the International Commission on Non-Ionising Radiation Protection (ICNIRP) 1998 Guidelines and in the EU Council Recommendation 1999/519/EC.

The likely sources of electromagnetic emissions from the Development will have low strength and will be located at such a distance from potential receptors that any likely effect will be imperceptible.

The levels likely to be generated during the decommissioning and construction phases are well below those specified in the ICNIRP 1998 Guidelines⁵ on the limit of exposure to radio frequency electromagnetic fields and electronic and magnetic fields at 50/60Hz and in the EU Council Recommendation 1999/519/EC.

Consultation was carried out with telecommunications operators and all comments received in response were considered, and constraints and mitigation measures incorporated into the design phase of the Development.

12.6.7 Final Decommissioning Phase

When decommissioning of the Development takes place, effects associated with this phase on telecommunications will be similar to those at the construction phase.

12.6.8 Mitigation Measures

All electrical elements of the Development are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety.

Compliance with the EMC Directive 2014/30/EU will mean that the electromagnetic emissions from devices used will not cause interference to other equipment.

⁵ International Commission on Non-Ionising Radiation Protection (1998) *ICNIRP Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)* Available online at: <https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf> [Accessed: 09/03/2023]

Additionally, mitigation options, such as technical solutions including re-alignment or replacement of TV antenna, re-tuning to alternative TV transmitters or provision of subscription free satellite television services can be implemented.

12.6.9 Cumulative Effects

There is 6 No. proposed, permitted or operational wind farms within 20km of the Development (see **Table 2.1, Chapter 2: Development Description**) which have been considered for potential cumulative effects. In line with the Wind Energy Guidelines 2019, each Developer is responsible for engaging with all relevant telecommunications operators to ensure their proposals will not interfere with television or radio signals by acting as a physical barrier. Therefore, as each project is designed and built to avoid impacts arising, a cumulative impact cannot arise. There will be no cumulative impacts relating to the Development and surrounding projects in relation to telecommunications.

12.6.10 Statement of Significance

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

12.7 ELECTRICITY NETWORKS

12.7.1 Introduction

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

However, in consultation with ESB Networks to accommodate construction works onsite some realignment of existing low voltage distribution network lines will be required, This work will be accommodated in advance of commencement of construction of the development.

The nationwide electricity transmission system allows for the transport of large volumes of electricity from generation stations, including wind farms, to bulk supply points near the main population centres where it interconnects with the distribution system. The Grid Connection will be 16.1km in length and will be along public roads.

Connection will be sought from the grid system operator by application to EirGrid. The substation will connect via underground 110kV cables. At the existing Dungarvan 110kV substation, the cable will connect into existing infrastructure within the confines of the

substation and its compound. The Grid Connection will be constructed to the requirements and specifications of EirGrid (CDS-GFS-00-001-R1).

12.7.2 Assessment Methodology

TLI Group were engaged by The Developer to identify and analyse potential grid connection options available for the Dyrick Hill Wind Farm Project these can be found in **Appendix 12.1**. The Developer indicated that the proposed grid connection point which will be offered by ESB will be Dungarvan 110kV ESB Substation (Dungarvan ESB Substation), located in the townland of Glencoh, Co. Waterford, therefore grid connection route options were assessed on this basis.

The Dungarvan 110kV Substation is located approximately 16km southeast of the Development at its closest point. The TLI study identified 3 possible grid connection options. From these, one option has been chosen and is assessed in this EIAR. The grid connection between Dyrick Hill Windfarm and Dungarvan 110kV Substation is proposed to be an underground cable (UGC), utilising sections of cabling in public roads, primarily regional public roads, as well as private third-party lands. The length of the connection is circa 16.01km.

A new 110kV Substation will be constructed on-site to allow for the additional capacity and to meet the specification requirements of ESB Networks.

12.7.3 Assessment of Potential Effects

Due to the fact that all on-site internal cabling will be underground as will the grid connection from the onsite substation to Dungarvan, there will be no impact on the overhead electricity network.

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

At the existing Dungarvan 110kV substation, the cable will connect into existing infrastructure within the confines of the substation and its compound and thus will have a **slight, short term effect**.

12.7.4 The 'Do-nothing' Impact

If the development does not proceed, there will be no offset to fossil fuel usage, and no provision of additional electricity in the local area.

12.7.5 Mitigation Measures

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

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

12.7.6 Cumulative Effects

There are 6 No. proposed, permitted or operational wind farms within 20km of the Development (see **Table 2.1, Chapter 2: Development Description**) which have been considered for potential cumulative effects. The grid connections will be individually connected to the grid network and not share cable trenches or Joint Bays. There will be no cumulative impacts relating to the Development and surrounding projects in relation to electricity networks during the construction phase. The proposed Coumragappul Wind Farm if constructed will share the grid route for approximately 7,370m, (2,050m) on L5068 Road and R672 (5,320m). Both these roads have been assessed; it is concluded that these roads have enough space to accommodate the grid connection for both Wind Farm projects.

Potential negative cumulative effects on electricity networks are anticipated to have **imperceptible impact** during the operational and decommissioning phases.

12.7.7 Statement of Significance

No significant negative impacts on the grid connection or grid network are anticipated. There may be some short-term disruption possible on account of realignment work needed in advance of wind farm construction. There will be a long-term slight positive residual impact on transmission infrastructure in the area (due to the installation of new infrastructure) and no impact on distribution. It is not proposed to utilise any elements of the distribution

network. In addition the energy produced will be from carbon neutral technology which will offset carbon from fossil fuel energy production locally which will be a slight positive local impact.

12.8 AIR NAVIGATION

12.8.1 Introduction

Operating windfarms have the potential to cause a variety of adverse effects on aviation. Rotating wind turbine blades may have an impact on certain aviation operations, particularly those involving radar. The physical height of turbines can cause obstruction to aviation and the overall performance of communications, navigation and surveillance equipment. According to the Irish Aviation Authority (IAA) Guidance Material Annex 14, *Structures that extend to a height of 150m or more above ground elevation should be regarded as an obstacle*⁶. The IAA requires that all structures over 150m in height require lighting of an obstacle⁷ to warn aviation traffic. The proposed turbines at Dyrick Hill Windfarm will have a maximum overall tip height of 185m above ground level, during operation.

The nearest operational airport to the Development is Waterford Airport which is located c. 45km east of the Development. However, there have not been any commercial scheduled flights since 2016⁸. An Bord Pleanála approved an extension to and widening of existing runway on 02/02/2022⁹ from 1,433 meters to 2,287 meters. This is envisioned to increase aircraft traffic to the area and facilitate larger aircraft from commercial airline operators. Cork Airport, the next closest international commercial airport, is situated c.60km from the proposed development site. The closest airstrip is situated in Ballyboe, as listed by the Irish Aviation Authority, 22km north of the site, this is a small airstrip and not used for commercial flights.

12.8.2 Consultation

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

⁶ Irish Aviation Authority (2015) *Guidance Material on Aerodrome Annex 14 Surfaces*. Available online at: [https://www.iaa.ie/docs/default-source/publications/advisory-memoranda/aeronautical-services-advisory-memoranda-\(asam\)/guidance-material-on-aerodrome-icao-annex-14-surfaces.pdf?sfvrsn=e2ae0df3_6](https://www.iaa.ie/docs/default-source/publications/advisory-memoranda/aeronautical-services-advisory-memoranda-(asam)/guidance-material-on-aerodrome-icao-annex-14-surfaces.pdf?sfvrsn=e2ae0df3_6) [Accessed: 09/03/2023]

⁷ Irish Aviation Authority (2005) Statutory Instrument No. 215 of 2005, *Obstacles to Aircraft in Flight Order, 2005*. Available online at: [https://www.iaa.ie/docs/default-source/publications/legislation/statutory-instruments-\(orders\)/irish-aviation-authority-\(obstacles-to-aircraft-in-flight\)-order.pdf?sfvrsn=fcb70df3_4](https://www.iaa.ie/docs/default-source/publications/legislation/statutory-instruments-(orders)/irish-aviation-authority-(obstacles-to-aircraft-in-flight)-order.pdf?sfvrsn=fcb70df3_4) [Accessed: 09/03/2023]

⁸ https://en.wikipedia.org/wiki/Waterford_Airport [Accessed: 09/03/2023]

Table 13.3: Summary of Consultation Response

Consultee	Response Date	Response
Irish Aviation Authority The Times Building 11-12 D'Olier Street Dublin 2	Letter in Response to Scoping Report received: 27/04/2022	<i>The development appears to be approximately 63km North East of Cork Airport and 46km East of Waterford airport., as such, it is likely that the following general observations would be proffered during a formal planning process: In the event of planning consent being granted, the applicant should be conditioned to contact the Irish Aviation Authority to: (1) agree an aeronautical obstacle warning light scheme for the wind farm development, (2) provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and (3) notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.</i>
Department of Defence	Received 13 th May 2022	<p><i>Based on the information supplied and having consulted with our Air Corps colleagues, The Department of Defence would like to make the following observations:</i></p> <ul style="list-style-type: none"> <i>• Single turbines or turbines delineating a windfarm should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week.</i> <i>• Obstacle lighting should be incandescent or of a type visible to Night Vision equipment.</i> <i>• Obstacle lighting must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.</i> <i>• Due to the nature of flight operations by the Irish Air Corps the above lighting requirements are separate to ICAO and IAA lighting requirements.</i> <p><i>Please contact me if you have any queries in this regard.</i></p> <p><i>Best regards</i> <i>Don</i></p>

12.8.3 Assessment of Potential Effects

Considering the proximity of the Development to surrounding aviation facilities, no potential effects to air navigation were identified.

12.8.4 The 'Do-Nothing Impact'

If the Development were not to proceed, there would be no impact on aviation operations in the area.

12.8.5 Mitigation Measures

The IAA will be consulted and upon request, the turbine with the highest elevation above sea level (mOD) or turbines at the extremities of the site, and any obstacle 100m or greater, will be installed with a warning light system under direct specification and in accordance with ICAO Annex 15. It should be noted that infra-red lights are not visible to the naked eye. The IAA and the Local Authority will be informed of the coordinates of the constructed positions of the turbines and the highest point of turbines or any infrastructure greater than 100m at least 30 days prior to erection. The IAA and Local Planning Authority will be notified at least 30 days in advance of intended crane erection.

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

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

- The WGS84 coordinates (In degrees, minutes and seconds) for each turbine
- Height above ground level (to blade tip) and elevation above mean sea level (to blade tip) in both meters and feet.
- Horizontal extent (rotor diameter) of turbines and blade length where applicable in both meters and feet.
- Lighting of the wind farm, which turbine(s) is/are lit, and what type of lighting.

12.8.6 Cumulative Effects

There is 6 No. proposed, permitted or operational wind farms within 20km of the Development (see **Table 2.1, Chapter 2: Development Description**) which have been considered for potential cumulative effects. Each Developer is responsible for engaging with the aviation authority to ensure the proposals will not interfere with aviation radio signals by acting as a physical barrier. Therefore, as each project is designed and built to avoid impacts arising, a cumulative impact cannot arise. There will be no cumulative impacts relating to the Development and surrounding projects in relation to aviation during the construction phase. The installation of aeronautical obstacle warning lighting as required by the Irish Aviation Authority and Department of Defence will mitigate against potential aviation accidents in the surrounding area.

Potential negative cumulative effects on aviation are unlikely during the operational and decommissioning phases.

12.8.7 Statement of Significance

No significant impacts are predicted in terms of air navigation. In adherence to IAA Safety Regulations and ICAO Annex 15, aeronautical obstacle warning light schemes will be installed as requested by IAA. Co-ordinates of ground and tip height elevations at each wind turbine location as constructed will be provided to the IAA. IAA will be notified of the provision of the intention to commence crane operations within a minimum of 30 days prior to erection. The potential effects of the Development on air navigation are considered **not significant**.

No significant impacts are predicted in terms of air navigation.

12.9 QUARRIES

12.9.1 Introduction

While sub-base and base course materials for the Access Track and Turbine Hardstand construction will be sourced on site from an onsite borrow pit, crushed stone will be imported for the final running layer. The crushed stone (20,000m³) for construction of the Development will come from licenced quarries in the locality such as:

- Roadstone Cappagh, Cappagh
- Kereen Quarry, Laffansbridge
- Gleeson Quarries, Laffansbridge
- Corbett Concrete, Mooneraha
- Lagan products , Middleton

These quarries will also be the source of crushed stone and concrete for widening works to the Turbine Delivery Route (Belview Port exit, N29, N25, N72, R672, L-5071 and R671 Finisk Bridge), Turbine Foundations and for Grid Connection works. The locations of these quarries in relation to the Development can be seen in **Figure 14.3** in **Chapter 14: Traffic and Transport**.

12.9.2 Assessment of Potential Effects

The construction of the Development will impact on natural resources such as aggregates which will be sourced from the quarries in proximity to the Site (section 13.9.1).

It is likely that a small amount of granular material may be required to maintain access tracks during operation which could impact the source quarry. However, the decommissioning phase will have no impact on the source quarry.

The use of imported material will have a slight, permanent negative impact on non-renewable resources of the area. This impact is considered to be imperceptible in the long-term.

12.9.3 The 'Do-Nothing Impact'

If the Development were not to proceed, there would be no impact on quarry operations in the area and quarrying activities would continue.

12.9.4 Mitigation Measures

- Existing tracks have been used where possible and the layout was designed to minimise the length of new track required in order to reduce the requirement for such stone material.
- One site borrow pits will provide a total volume of c.31,788m³. The quarry will only be used where the material won onsite is not suitable (c.45,407m³).
- Local quarries have been identified to reduce impact on transportation (Please see **Chapter 14: Traffic and Transportation**).
- The source quarry will be chosen based on stone which is chemically similar to that occurring at the Development. This will reduce hydrogeochemical impacts. (Please see **Chapter 8: Soils and Geology**)

12.9.5 Cumulative Effects

There is 6 No. proposed, permitted or operational wind farms within 20km of the Development (see **Table 2.1, Chapter 2: Development Description**) which have been considered for potential cumulative effects.

The very nature of a quarry is that it will be subjected to cumulative effects as it is the source of stone for almost all developments in the area.

Therefore, there will be cumulative impacts relating to the Development and surrounding projects in relation to quarries during the construction phase. It is anticipated that Dyrick Hill and Coumnagappaul developments will not be built out at the same time. In a scenario where the construction phases of both projects overlap the result of the cumulative impact would remain the same. There would be a **slight negative impact** on depleting stocks of natural resources such as aggregate material sourced from the quarry.

Potential negative cumulative effects on quarries are imperceptible/unlikely during the operational and decommissioning phases.

12.9.6 Statement of Significance

No significant negative impacts on local quarries are anticipated. There will be a **slight, permanent negative** residual impact on natural resources in the area.

This impact is considered to be **imperceptible** in the long-term.

12.10 UTILITIES

12.10.1 Introduction

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

12.10.2 Assessment Methodology

In order to assess the potential for impacts to electricity and water infrastructure and waste services, a scoping exercise was carried out with a number of key consultees, including ESB, Irish Water and Local Authorities. Full details of the scoping exercise that was carried out is provided in **Chapter 1: Introduction**.

A desk study of available information from the EPA did not identify any waste facilities, illegal waste activities, chemical monitoring points or industrial EPA licensed facilities within a 2km radius of the wind farm site. The nearest licensed waste receiving facility to the Development is Dungarvan Civic Amenity Site (X35 WE20).

12.10.3 Assessment of Potential Effects - Gas, Water Utilities

There are no gas mains located within the Site Boundary. There is therefore no potential for impact on the domestic or commercial gas supply network. Gas Networks Ireland have responded to a consultation request illustrating there are no existing services along the Grid Connection Route (see, **Appendix 12.1**) or Turbine Delivery Route (see, **Appendix 14.2**) and there does not appear to be any visible gas infrastructure along the route.

Given that no detailed information has been provided by Irish Water or Waterford City and County Council in relation to water services within the Site Boundary, it has been assumed that there is the potential to encounter local water services within the Development.

TLI Group conducted a survey of the Grid Connection Route, the locations of watermains, fire hydrants, metres and sluice valves were recorded and can be found in **Appendix 12.1**.

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

12.10.4 Assessment of Potential Effects - Waste

Staff Facilities

During the construction, operational and decommissioning phases of the Development, there will be the typical plastic and / or “disposable” waste that might be typically generated in a commercial work office setting, such as plastic and glass bottles, left-over food and sandwich wrappers / containers. Generally, this can be classified as non-hazardous waste. All such wastes will be required to be disposed and temporarily stored on site within the temporary construction compound prior to appropriate disposal at a licensed waste facility. The effects of this waste will not be significant.

Sewage

The self-contained port-a-loo units at the construction/decommissioning phase which will be managed and serviced regularly (by removal of the contents by tanker to a designated sewage treatment plant such as Dungarvan Wastewater Treatment Plant and removed off site on completion of construction. Toilet waste is a non-hazardous waste and effects will be slightly significant.

The maximum wastewater production during construction is estimated to be the same as the maximum water consumption (5,880 litres per day)¹⁰.

All wastewater will be tankered off-site by a licensed waste collector to the nearest wastewater treatment plant. There will be no on-site treatment of wastewater and effects will no be significant.

¹⁰Table 3 of the EPA WW treatment Manual (Treatment systems for Small Communities, Business, Leisure Centres and Hotels), Environmental Protection Agency, 1999. Quarry (Excluding Canteen) best reflects a construction site. [Available online: https://www.epa.ie/publications/compliance--enforcement/wastewater/EPA_water_treatment_manual_small-comm_business.pdf] [Accessed: 09/03/2023]

Concrete

The use of concrete (construction of Turbine Foundations, Substations etc.) onsite will have slight and permanent effects. It is expected that 20 L – 30 L of concrete washout will be produced during the construction phase.

There will be no need for the use of concrete during the operational phase and effects are imperceptible.

Concrete structures will be left in place during decommissioning and allowed to naturally revegetate over time. This is the least impactful process of decommissioning. As the Site will have already been altered, the impacts are imperceptible and permanent.

Chemicals, Fuels and Oils

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

Refuelling

As this has been mitigated by design, the residual effects are not significant.

There will be no need for refuelling during the operational phase and effects are imperceptible.

The quantity of waste produced from refuelling is imperceptible.

Packaging

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

'A producer who supplies to another producer packaging material, packaging or packaged products shall comply with any reasonable request from the latter producer for data on the

weight of the material or packaging concerned sufficient to enable the latter producer to comply with these Regulations.'

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

This waste is non-hazardous, and the effects of this waste are not significant.

Metals

During decommissioning, it is expected that 100 tonnes of steel will be removed from turbine bases. This waste is non-hazardous, and effects will be not significant.

Excavated Materials

Excavated materials will be required for habitat and ecological restoration, reprofiling and backfilling in accordance with the CEMP **Appendix 2.1**. As such, excavated materials will not be classified as waste except along the Grid Connection Route.

An estimated 12,600m³ of material will be excavated along the Grid Connection Route and will be transported by an authorised waste permit holder to a licensed facility.

The effect of this will be not significant.

12.10.5 The 'Do-Nothing Impact'

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

12.10.6 Mitigation Measures - Utilities

Mitigation measures relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology** and referred to in **Chapter 5: Population and Human Health**.

12.10.7 Mitigation Measures - Waste

Staff Facilities

Provision for separation of waste streams will be provided so that e.g., paper, and cardboard waste and bottles may be recycled.

Sewage

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

Concrete

During the construction phase:

- Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the development where the use of precast concrete is not possible include turbine foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply.
- The acquisition, transport and use of any cement or concrete on site will be planned fully in advance and supervised at all times.
- Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on vehicles which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order.
- Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints.
- Concrete will be poured during meteorological dry periods/seasons. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e. avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any foreseen intense rainfall event (>3mm/hour, yellow on Met Eireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Eireann. This also will avoid such conditions while concrete is curing, in so far as practical.
- Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately.

- Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.
- Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g., using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off.
- No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately.

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

Concrete structures will be left in place during decommissioning and allowed to naturally revegetate over time. This is the least impactful process of decommissioning. As the Site will have already been altered, the impacts are negligible and permanent.

Chemicals, Fuels and Oils

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

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

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

Where mobile bowsers are used on site, guidelines will be followed so that:

- Any flexible pipe, tap or valve will be fitted with a lock where it leaves the container and be locked shut when not in use;

- Flexible delivery pipes will be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Where possible, a nozzle designed to dispense oil is used;
- The pump or valve will have a lock and be locked shut when not in use.

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

Refuelling

During construction/decommissioning, where possible, all refuelling on site will be within the temporary compound within the re-fuelling area (see Drawing No. **6497- PL- 803**). Only essential refuelling (e.g., cranes) will be carried out, outside of this area, but not within 50m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection. This membrane will be inspected and if there is any sign of oil contamination, it will be removed from site by a specialist licensed waste contractor. All vehicles will be well maintained and free from oil or hydraulic fuel leaks.

Packaging

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

Metals

Waste metals from concrete reinforcing during construction and removal of metals during decommissioning etc. will have commercial value and will be re-used or recycled with the appropriate licensed waste contractor.

12.10.8 Statement of Significance

There are no gas mains located within the Site Boundary. There is therefore no potential for impact.

It has been assumed that there is the potential to encounter local water services within the Development. Potential impacts arising from the Development relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology**

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the EIAR Site Boundary. The closest, authorised municipal waste facility is located approximately 13.8km southeast of the Development in the townland of Ballynamuck Middle, Dungarvan, Co. Waterford. A list of waste facilities within the vicinity of the Development has been included in **Appendix 2.1**. (Please see, **Figure 14.7**).

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