

14 MATERIAL ASSETS

This chapter has been reviewed and updated where necessary considering any subsequent modifications, updates and additional information acquired for the Further Information Request issued by Louth County Council (LCC) on the 6th February 2025 (Reference No: 2460766). It is noted that for ease of reference all changes from the original chapter are shown in orange. Where text has been removed it is shown as ~~strikethrough~~.

Following a review of the proposed development based on the Request for Further Information, it has been determined that site entrance 4 is not required for the construction, operation and decommissioning of the proposed development, as all works can be accommodated via the proposed site entrances 1-3. Therefore, it is proposed that entrance 4 will not be taken forward as part of the proposed development, and the initially proposed use of entrance 4 will instead be accommodated at entrance 2. The author of this chapter has reviewed the revision, and no implications for the assessment presented in this chapter have been identified.

14.1 INTRODUCTION

This chapter assesses the impacts of the Project on material assets. The Project refers to all elements of the Kellystown Wind Farm, including the Proposed Development and all additional works outside the Redline Boundary (**Chapter 2: Description of the Proposed Development**). The assessment will consider the potential effects during the following phases:

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

Common acronyms used throughout this EIAR can be found in **Chapter 1: Introduction, Appendix 1.3** Glossary of Common Acronyms.

This chapter of the EIAR is supported by the following Appendix in **Volume IV**:

- **Appendix 14.1:** Aviation Analysis Report re Potential Wind Farm near Kellystown, County Louth
- **Appendix 14.2:** Technical Note 3 – TLI Group

14.2 STATEMENT OF AUTHORITY

Jennings O'Donovan & Partners Ltd. (JOD) have extensive experience in all aspects of wind farm development, from design and planning stages through to construction. JOD have been active as engineering consultants in the wind energy market in Ireland since 1998 and have completed numerous wind farm projects, varying from single wind turbine installations to large-scale, multi-turbine developments with a total of over 2,000MW generation capacity.

This chapter has been prepared by Environmental Scientists of Jennings O'Donovan & Partners Ltd; Ms Aisling Layden (PhD research in Global Lake Climatology and MSc in Environmental Sustainability from The University of Edinburgh), Mr. Ryan Mitchell (Bachelors' Degree in Animal Conservation and Biodiversity obtained from Greenwich University) and Mr. Padraig O'Dowd B.A (M.Sc. Design Innovation (Design & Anthropology and GradDip. Design Thinking for Sustainability from University College Dublin)). This chapter has been reviewed by David Kiely, Director of JOD (MSc in Environmental Protection from IT Sligo and Bachelor of Engineering in Civil Engineering from University College Dublin).

Technical input and support has been provided from Joe Codd (professional forester; Bachelors' Degree in Agricultural Science and Diploma in Forestry Science), and J. Declan O'Dwyer of O'Dwyer & Jones Design Partnership (Aviation Planning & Architecture Consultants) and TLI Group (construction techniques and methodologies for 38kV grid connection to the Drybridge 110 kV Substation).

This Chapter was reviewed considering any subsequent modifications, updates and additional information required for the Further information Request issued by Louth County Council (LCC) on the 6th February 2025 (Reference No: 2460766) by Mr. Ryan Mitchell an Environmental Scientists at Jennings O'Donovan & Partners Ltd.

Detailed biographies/CVs of those who contributed to the preparation of this EIAR have been included in **Appendix 1.1: Author Qualifications**.

14.3 ASSESSMENT STRUCTURE

In line with the revised EIA Directive and current EPA guidelines listed in **Chapter 1: Introduction, Section 1.7** the structure of this Materials Assets chapter is as follows:

- Description of baseline conditions at the Site;
- Do Nothing Impact Assessment;

- Identification and assessment of impacts to Materials Assets associated with the Project, during the construction, operational and decommissioning phases of the Project;
- Mitigation measures to avoid or reduce the impacts identified;
- Identification and assessment of residual impact of the Project considering mitigation measures, and
- Identification and assessment of cumulative impacts if and where applicable.

The material assets assessed included in this chapter are:

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

This chapter is an EIA of the Proposed Development on the above listed material assets. A full description of the Proposed Development is outlined in **Chapter 2: Description of the Proposed Development, Section 2.3** and includes one Turbine Delivery Route (TDR) (the Proposed TDR) and one Grid Connection Route (GCR) (the proposed GCR) **as shown as in Planning Drawings: 05949-DR-101 – 106**. Other viable GCR/TDRs have also been assessed as part of the EIAR. These routes; GCR option 2 and TDR option 2 and TDR option 3 do not form part of the planning application, yet these route options are fully assessed as documented in **Appendix 3.1**.

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 10: Soils and Geology, Chapter 11: Hydrology and Hydrogeology, and Chapter 18: Air Quality and Climate**. Peat and spoil are assessed in **Chapter 10: 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 15: Cultural Heritage** and traffic is addressed in **Chapter 16: Traffic and Transport**. Utilities such as water, wastewater and waste services are addressed in this chapter and in **Chapter 2: Description of the Proposed Development**.

14.4 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

In line with the EIA Directive 2011/92/EU as amended by EIA Directive 2014/52/EU and the current EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022 (the EPA Guidelines 2022), this chapter of the EIA aims to focus the assessment solely on those elements likely to have a known effect on the environment and resources.

The turbine component dimensions incorporated in the design flexibility (**Chapter 2: Description of the Proposed Development, Section 2.6.2**) are considered in the assessments within this chapter.

Grid Connection Route (GCR)

Within this chapter, the GCR from the proposed on-site substation to Drybridge 110kV (12.65km) is assessed. A small section of the GCR is located within the redline boundary, with the remaining 11.75km located in the public roads i.e., lies within the existing road structure. Therefore, the section outside the redline boundary, does not require land use assessment, and as it is an underground GCR it does not require Aviation assessment.

Turbine Delivery Route (TDR)

Only 1 section of the TDR requires non-temporary works, this section lies within the Redline Boundary and is therefore assessed alongside all works within the Wind Farm Site. Outside of the Redline Boundary all works are temporary and will be carried out above ground, e.g, vegetation clearance, removal of street furniture, and therefore does not require assessment for land use changes, Telecommunications, Electricity, Aviation and Utilities.

14.4.1 Receptors

In this materials assets assessment, the receptors in the receiving environments are:

- any dwelling/business/community buildings that have the potential to experience interference to broadcast services from telecommunication operator sites/ infrastructure
- any dwelling/business/community buildings that have the potential to experience electrical outage
- Any Aeronautical receptors; Dublin Airport, Irish Aviation Authority (IAA), Department of Defence, with potential effects on air navigation equipment or radar installations instruments and flightpaths including low-flying aircrafts in the vicinity

- Available natural resources, such as crushed stones or aggregates
- Any dwelling/business/community buildings that have the potential to experience interference to the gas, water or wastewater services.

14.4.2 Baseline conditions

To establish the baseline conditions of the receiving environment, the following methods/ approaches were used;

Land use (Agricultural and Forestry):

- Review of the Proposed Development and Site layout in ArcGIS Pro version 3.1
- Review of Forestry Report which assessed the forestry within and around the area of the proposed Wind Farm
- Review of Site Habitat Maps and available aerial imagery
- Review of Environmental Protection Agency Maps; CORINE Land Cover (Copernicus)

Telecommunications:

- All telecommunications operators were contacted to identify any potential microwave or telecommunication links (ENET, ESB telecoms, Virgin Media, Three Ireland, Tatra Ireland, RTE/2rn, Vodafone, Eir Limited)

Electricity:

- ESB networks was contacted to identify all electricity cables in the area
- TLI Group mapped the electricity networks for the proposed Grid Route

Aviation:

- Irish Aviation Authority (IAA), Department of Defence and Dublin airport were contacted during the consultation process
- ICAO (International Civil Aviation Organization) Aeronautical Chart were examined

Quarries:

- Review of licensed quarries and suppliers in the area was undertaken
<http://facilityregister.nwcpcp.ie/>

Utilities:

- Gas Networks Ireland (GNI) and Uisce Éireann were contacted to identify all gas and water/ waste water infrastructure in the area of the Proposed Development.

Waste:

- Review of licenced waste facilities in the surrounding area was undertaken:
<https://facilityregister.nwcpo.ie/>
- Identification all waste facilities in the locality was undertaken:
<https://gis.epa.ie/EPAMaps/>

14.4.3 Identification of Impacts

To identify the impacts on the receiving environment, the following methods/approaches were used;

Land use (Agricultural and Forestry):

- Assessment of land take/changes within redline boundary, including the TDR modification section (which lies within redline boundary).
The forestry areas identified in the Forestry Report (**Appendix 2.2**) were used to identify forestry changes. Site Habitat Maps and aerial imagery was utilised to assess impact of agricultural land use.

Telecommunications:

- Responses from the telecommunications operators were used to identify any potential microwave or telecommunication links and to inform design changes.

Electricity:

- Responses from the telecommunications operators were contacted to identify all electricity cables in the area (overhead and underground) and to inform design and setback distances.
- TLI Group examined the electricity networks in the proposed Grid Route connection
- TLI Group examined the route in further detail including electricity networks - Feasibility Technical Note 3 - UGC Route from Drybridge to R-132 (Appendix 14.2).

Aviation:

- An aviation study was undertaken by Aviation Planning Consultants (O'Dwyer and Jones) on behalf of the developer to consider the conditions and requirements laid down by the Civil Aviation and Irish Aviation Authority and the Department of Defence and Air Corps.

Quarries:

- The operational licensed quarries in the area were assessed for the capability of providing materials for the Project.

Utilities:

- All GNI and Uisce Éireann infrastructure was mapped to inform design changes and assess impact
- TLI Group examined utilities - Feasibility Technical Note 3 - UGC Route from Drybridge to R-132 (Appendix 14.2).

Waste:

- A review of licenced waste facilities was undertaken for the purposes of supporting the Project

14.4.4 Significance of effects

The significance of effects resulting from the Development is determined through consideration of a combination of the sensitivity of the receiving environment and the predicted level of change from the baseline state, as outlined in **Chapter 1: Introduction**, **Table 1.6** and **Table 1.7**. Where negative effects are predicted, appropriate mitigation approaches are identified.

14.4.5 Mitigation measures

The mitigation hierarchy approach, as outlined in **Chapter 1: Introduction** of Avoidance, Reduction/Elimination and Remedy aims to avoid significant impact through embedded mitigation (avoidance), and where avoidance is not possible, through mitigation measures. Remedy, the lowest rung of the mitigation hierarchy is only considered where mitigation measures are not feasible or possible.

14.4.6 Cumulative Assessment

Other large developments (operational and in the planning process) within a 20km of the Development (shown in **Table 2.1, Chapter 2: Description of the Proposed Development**), in conjunction with the Proposed Development, are assessed to determine the potential cumulative effects on Material Assets.

14.5 LAND USE - AGRICULTURE

14.5.1 Baseline Environment

The Wind Farm Site, located within an area of farmland (livestock and crop), forestry and scrubland, and is located within the townlands of Brownstown, Castletown, Cartanstown, Drumshallon, Gallstown, Groom, Kearneystown, Keeverstown, Piperstown, Rokeby, Stonehouse and Swinestown. The Wind Farm Site is located 8.3km north of Drogheda, 23.6km south of Dundalk and 50km north of Dublin.

The Wind Farm Site is characterised as being generally improved grassland and scrubland landscape which is currently being used for intensive agriculture, forestry and livestock grazing. The Proposed Development as a whole is characterised by elevation of between 88m and 126m AOD. and a spatial area of 165 ha, as referenced in **Appendix 2.2: Forestry Report**. The total Redline Boundary (which includes the grid connection route) comprises 83.26 ha. The Wind Farm Site comprises 64.5 ha and lies within the characterised area (**Appendix 2.2**), comprising a mixture of farmland, forestry, scrubland and one recognised wetland site (Drumshallon Lough cNHA)¹. All the lands are in private or third-party ownership. The Site and surrounding area is largely rural with isolated residences and farmsteads and ribbon development, there is improved grassland to the south, forestry to the southwest, scrubland and improved grassland to the west, exposed rock (quarry) within the northern section of the Wind Farm Site (outside of the Redline Boundary), forestry and improved grassland to the north and farmland (livestock and crop) and improved Grassland to the east.

14.5.2 Assessment of Potential Effects

The total land-take of the Wind Farm Site, including the Site Access Roads, Turbine Hardstands, Turbine Foundations, Turbine Delivery Route widening node and substation is 15.6 ha. The Wind Farm Site is 64.5 ha, therefore, the total land take is 24.2% 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 Proposed Development will result in a change of 6.2 ha (9.6% of total Wind Farm Site) of agricultural land use (comprising 5.39 ha/8.3% of pasture, 0.56 ha/0.9% of silage and 0.25 ha/0.4% of arable land, in areas where new Site Access Roads, wind turbine bases, hardstanding areas, Permanent Met Mast,

¹ Wetlands Surveys Ireland, 2021 <http://www.wetlandssurveysireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---map/> [accessed 14 August 2024]

the onsite 38kV Substation Control Buildings and Battery Energy Storage System (BESS) infrastructure will be located. There will be an additional 1.2 ha of agricultural land used in the associated drainage.

The construction of the Grid Connection Route and Turbine Delivery Route will only require relatively localised excavation works within and adjoining the public roads.

The total length of the proposed 38kV underground grid route connection, from Onsite Substation and Control Building and the existing Drybridge 110kV Substation, is approximately 12.65km. A small portion of the GCR is located in the Site Access Roads within the Redline Boundary, the remainder of the GCR (11.75km) is within public road corridor.

Temporary modifications to the existing public road infrastructure to facilitate delivery of abnormal loads and turbine delivery. These works will be carried out at the following locations: Galway Docks, Monivea Rd, Junction Galway, Junction on the R339, N6, Lucan Roundabout, N4 joining the M50, M50, Hill of Rath Roundabout and Rosehall Roundabout. There is one section of the TDR that will require works in third party lands to construct a new road at the R132, L-6274 Junction, close to the Wind Farm Site. This section of the TDR is included within the Redline Boundary.

There will be two turbines located on agricultural lands, accounting for 1.94 ha of the 6.2 ha of agricultural pasture land that will be changed to wind farm use. This will have a **temporary, slight, negative** impact on agricultural land use due to the removal of grazing lands during the construction phase and a **long-term slight negative** impact on agricultural land use for the duration of the operation phase of the Project.

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.

14.5.3 The 'Do-Nothing' Impact

If the Proposed Development does not proceed, lands within in the Redline Boundary of the Wind Farm Site will continue to be used for agricultural purposes. In this case, the likely evolution of the baseline environment may progress towards less optimal farming practices due to a reduction in soil fertility. Research from Teagasc² has shown that most soils in Ireland have been degraded (both chemically and physically) and have reduced levels for pH, Phosphate and Phosphorus which may lead to a drop in farming practices over time. This may have a **slight negative long-term** effect.

14.5.4 Mitigation Measures

A process of "Mitigation by Avoidance" to avoid or minimise impacts on agricultural land use has been incorporated into the design stage. The construction and operational footprint of the Proposed 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.

14.5.5 Residual Effects

Implementation of the mitigation measures, outlined in **Section 14.5.4**, at the design stage will ensure that residual impacts on agricultural land use will be **slight negative** and **temporary** for the duration of the construction and **negligible** for the operational lifespan of the Project.

For decommissioning phase, the residual effect will be **slight negative** and **temporary** for the duration of the phase.

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 16: Traffic and Transport** refers to all proposed works and deliveries along the turbine delivery route to avoid undue impact to adjacent land uses.

² Teagasc, 2023, Soil, Forests and Biochar, Available at: <https://www.teagasc.ie/news--events/daily/forestry/soil-forests-and-biochar.php> [Accessed 10/09/2024]

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: Description of the Proposed Development**.

Thus, the residual impact on surrounding agricultural land uses is **slight** during construction and decommissioning and **negligible** during the operational phase.

14.5.6 Cumulative Effects

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: Description of the Proposed Development** were considered. The adjacent quarry (Kilsaran Quarry) has recently been granted planning permission to extend the quarry by approximately 10 ha (LCC Reg. Ref. 22109, on the 27th November 2023) as discussed and shown in **Chapter 2: Description of the Proposed Development, Section 2.4.4.2**. This 10 ha area of land is located to the central eastern portion of the site and comprises scrubland which is used for light grazing. 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 operational wind farm is Dunmore Wind Farm which is located 11.4km to the west of the Wind Farm Site. Surrounding agricultural activities can and will continue during the construction, operational and decommissioning phases of the Proposed Development.

Due to the localised nature of the proposed construction/ operational and 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 Wind Farm Site.

Other projects outside the Wind Farm Site, including the permitted extension to Kilsaran Quarry may contribute to the cumulative effects during the construction/ operational decommissioning phases, primarily due to loss of 10 ha of scrubland, used for light grazing.

It is predicted that the residual impacts will be **slight negative** for the duration of the construction, **slight negative** during the operational lifespan of the Project and **slight negative** for the duration of the decommissioning phase.

14.5.7 Statement of Significance

No significant impacts are predicted on agricultural land use within or outside of the Wind Farm Site.

14.6 LAND USE - FORESTRY

14.6.1 Baseline Environment and Description of Development

For the baseline description of the Wind Farm Site and current land use and land use in the environs, refer to **Section 14.5.1**.

The Wind Farm Site contains approximately 14.1 ha of forestry, classed as Coniferous Forest and Mixed Forest according to CORINE Land Cover (Copernicus)³.

The proposed wind farm infrastructure layout requires some felling of forestry. A total of 9.39ha of forestry felling is required to facilitate the Wind Farm Site infrastructure and associated bat buffers, namely, turbines T01 Access Tracks and T01 and T05 Hardstands. A summary of the forestry affected is provided in **Table 14.1**. The commercial forestry is mainly made up of Sitka Spruce and Norway Spruce and is further detailed in **Appendix 2.2: Forestry Report**.

Table 14.1: Summary of Removal of Forestry to facilitate The Proposed Development

Infrastructure	Area of forestry lost (Ha)	Species present (as shown in Appendix 2.2 Forestry Report)
Access roads	0.91	Norway Spruce, Sitka Spruce, Japanese Larch (P1)
Turbine T01	3.91	Norway Spruce, Sitka Spruce, Japanese Larch, Sycamore (P1, P3)
Turbine T05	4.57	Norway Spruce, Sitka Spruce (P8, P11, P12)
Total	9.39	-

³ Environmental Protection Agency Maps <https://gis.epa.ie/EPAMaps/> [Accessed 13/08/2024]

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. Furthermore, it is environmentally prudent to process felling and afforestation licences closest to the time when those activities are to occur. Also identification of replant lands until such time as they are required enables identification of optimum lands available from an environmental perspective (in accordance with the standards at the time).

The Developer commits that the location of any replanting (alternative afforestation) associated with the Project will be greater than 10km from the wind farm Site and also outside any potential hydrological pathways of connectivity i.e., outside the ecological zone of Influence (Zol), within which the proposed project is located and will not give rise to any cumulative significant impacts within the project. Further details regarding the Zol are outlined in **Chapter 6: Biodiversity**.

14.6.2 Assessment of Potential Effects

The lands affected by the Project are currently in use for commercial forestry and agriculture. ArcGIS Pro was used to calculate areas of forestry within the surrounds of the Proposed Development. The Wind Farm Site was calculated to contain 14.1ha of Coniferous Forest and Mixed Forest. A comparison between the proposed layout design and the affected plots presented in Forest Report, **Appendix 2.2**, show that the clear-felling is confined to plot 1 (P1), plot 3 (P3), plot 8 (P8) plot 11 (P11) and plot 12 (P12) which comprise Stika Spruce and Norway Spruce (outlined in **Table 14.1**).

The removal of 9.39 ha (66.5%) of 14.1 ha commercial forestry lands within the Wind Farm Site will have a **permanent slight negative** impact on the existing forestry land use during the construction, a **permanent slight negative** during the operation phase and **permanent slight negative** during the decommissioning phase of the Project.

14.6.3 The 'Do-Nothing' Impact

If the Proposed Development does not proceed, lands within and in the vicinity of the Wind Farm Site will continue to be used for forestry and agricultural purposes. In this case, the

likely evolution of the baseline environment may progress towards a reduction in soil fertility. As outlined in **Section 14.5.3**, research from Teagasc has shown that most soils in Ireland have been degraded and have reduced levels for pH, Phosphate and Phosphorus which may lead to less productive forestry. This may have a **slight negative long-term** effect. If soils remedial action is undertaken, the long-term effect may change.

14.6.4 Mitigation Measures

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.

To ensure a tree clearance method that reduces the potential for sediment and nutrient runoff, the construction methodology will follow the specifications set out in the Forest Service Forestry and Water Quality Guidelines (2000) and Forest Harvesting and Environmental Guidelines (2000).

The construction of tracks, including the creation of buffer zones and trackside drainage, will take into consideration the following requirements and guidelines (available at: <https://www.gov.ie/en/publication/regulation-forest-health-and-resources/>)

- Environmental Requirements for Afforestation, June 2024 (DAFM, 2024)
- Forestry Standard Manual, July 2024 (DAFM, 2024)
- Land Types for Afforestation: Soil & Fertility, June 2024 (DAFM, 2024)
- Forests & Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021(DAFM, 2018)
- Forest Recreation in Ireland, A Guide for Forest Owners and Managers (Forest Service, 2006)
- Forest Protection Guidelines, November 2002 (Forest Service, Department of Communications, Marine and Natural Resources)
- Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures
- Guidelines published by the Forest Service, Department of the Marine and Natural Resources, July 2000:
 - Forestry and Water Quality Guidelines

- Forestry and Archaeology Guidelines
- Forest Biodiversity Guidelines
- Forest Harvesting and the Environment Guidelines

The construction and decommissioning works will be planned and managed by a Construction and Environmental Management Plan (CEMP) **Appendix 2.1** and Management Plan no. 6 to the CEMP (Decommissioning Plan). This provides details on day to day works and methodologies.

14.6.5 Residual Effects

The impact on land take during construction/decommissioning is likely to have a **permanent slight negative** impact on the forestry. Implementation of the measures outlined in **Section 14.6.4** will ensure that any residual impacts will be **not-significant negative and permanent** in duration.

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. Furthermore, it may reduce the need for additional forest clearance for building of additional forest roads. Thus, the residual impact on surrounding forestry land uses is **slight** during construction and decommissioning and **negligible** during the operational phase.

14.6.6 Cumulative Effects

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 Wind Farm projects in **Table 2.1, Chapter 2: Description of the Proposed Development** and the permitted extension to **Gallstown** (Kilsaran Quarry) (as outlined in **Section 14.5.6**) were assessed.

It can be concluded that the 10 ha area of scrubland allocated for the Kilsaran Quarry extension, has no impact on future forestry use, as this land is privately own and has not been altered in decades or been zoned for forestry.

Other projects outside the Wind Farm Site, including the permitted extension to Kilsaran Quarry do not have the potential to contribute to any significant cumulative effects during the construction/ operational decommissioning phases.

The surrounding commercial forested area of the Proposed 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 The Project and that there is no cumulative effect from loss of forestry due to the Wind Farm Site, no potential significant cumulative effects are considered likely.

14.6.7 Statement of Significance

No significant impacts are predicted on commercial forestry within or outside of the Wind Farm Site.

14.7 TELECOMMUNICATIONS

Microwave is a line-of-sight wireless communication technology that uses high frequency beams of radio waves to provide high speed wireless connections. Microwave links need an unobstructed line of sight from end to end. 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. For this reason, the potential impact of wind turbines on electromagnetic signals during the operational phase is assessed.

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*⁴. 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.

⁴ 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:17/06/2024]

14.7.1 Guidance

Potential telecommunication effects generated by the Proposed Development have been assessed in accordance with the following documents.

- Louth City and County Development Plan, 2021-2027
- Best Practice Guidelines for the Irish Wind Energy Industry, published by the Irish Wind Energy Association (2012).
- Information about Electric & Magnetic Fields and the Electricity Transmission System in Ireland, EirGrid⁵
- Wind Energy Development Guidelines: Planning Guidelines, Department of Environment, Heritage and Local Government (DHPCLG) 2006⁶
- Draft Revised Wind Energy Development Guidelines, Department of Housing, Local Government and Heritage (2019)⁷

14.7.2 Scoping and Consultation

Telecommunications providers were consulted about the Development. A summary of responses is outlined in **Table 14.2** and **Appendix 1.2** outlines full consultation responses.

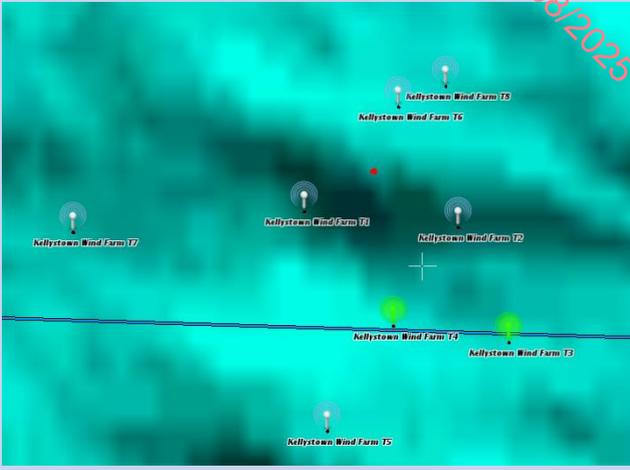
Table 14.2: Summary of Consultations

Consultee	Response Date	Response
RTÉ (2RN is the trading name of RTÉ Transmission Network DAC)	02/08/2023	<p><i>"The new Turbine locations do not change our previous assessment of the sites impact:</i></p> <p><i>The proposed wind farm site will have no impact on 2rn's fixed linking.</i></p> <p><i>There is however a risk of interference to broadcast services to viewers receiving from our sites at Drogheda and Clermont Carn.</i></p> <p><i>We would therefore ask that a protocol be signed between 2rn and the developers should the site go ahead."</i></p>
Eir Limited	24/08/2023	<i>"We have no transmission links within the proposed area, and it has no risk to the network".</i>
Vodafone	31/07/2023	<i>"I have reviewed the proposed turbine locations in the Kellystown Wind Farm development and I can confirm that based on coordinates that you have</i>

⁵ Eirgrid (2014) *Information on Electric and Magnetic Fields*. Available at: <https://www.eirgridgroup.com/site-files/library/EirGrid/Information%20on%20Electric%20and%20Magnetic%20Fields.pdf> [Accessed: 17/06/2024]

⁶ Department of Housing, Planning, Community and Local Government, *Wind Energy Development Guidelines (2006)*, Available at: <https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/> [Accessed 10/09/2024]

⁷ Department of Housing Local Government and Heritage (2019). Available at: <https://www.gov.ie/en/organisation/department-of-housing-local-government-and-heritage/>. [Accessed 17/06/2024]

Consultee	Response Date	Response
		<p>provided in the table below it is highly likely that turbine #4 and possibly turbine #3 will cause interference to an existing link on the Vodafone networks.</p> 
	N/A	<p>On 12 August 2024 Vodafone were sent the updated layout and co-ordinated for review. No response was received.</p>
Tetra Ireland	14/08/2023	<p>We anticipate no impact from the development as proposed.</p>
Three Ireland	31/07/2023	<p>None of these positions will have an impact on our transmission network</p>
Coimisiún na Meán	27/07/2023.	<p>Coimisiún na Meán does not perform an in-depth analysis of the effect of wind turbines on FM networks. However, we are not aware of any issues from existing wind farms into existing FM networks. Also, the proposed wind farms are not located close to any existing or planned FM transmission sites.</p>
ESB Telecoms	N/A	<p>No response received.</p>
ENET	N/A	<p>No response received.</p>
Virgin Media	N/A	<p>No response received.</p>

14.7.3 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 Proposed Development were shared with link operators. A summary of responses are shown in **Table 14.2**. Responses from Three, Eir

and Tetra stated that either they had no communication links in the area or that they did not anticipate any impact from the Proposed Development. No responses were received from ENET, ESB Telecoms and Virgin.

14.7.4 Assessment of Potential Effects

All potential effects, which are associated with the operational phase of the Project, are classified as long-term effects. Potential effects were highlighted as shown in **Table 14.2** by 2RN (the trading name of RTÉ) and Vodafone.

14.7.5 The 'Do-nothing Impact'

If the Proposed 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. The likely evolution of the baseline environment may be continued farming/ agricultural uses or alternative types of farming and forestry practices.

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

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 located close to the proposed turbines. Any interference effects will be temporary and are likely to be similar to those arising during the operational phase of the Proposed Development, resulting in interruption to telecommunications links by reflection, diffraction, blocking and interfering with radio frequency. This is further detailed in the CEMP **Appendix 2.1**.

The impact of the use of cranes to erect turbines may have a **temporary slight negative** impact on telecommunications during the construction phase.

14.7.7 Operational Phase

2rn transmission links: The scoping response provided by 2rn (2rn distribute and transmit the programme services of RTÉ Radio and Television), identified a potential risk of interference with two 2rn transmission links (Drogheda and Clermont Carn Transmitters).

Vodafone network: The scoping response from Vodafone, indicated that 2 turbines (in a previous 8 turbine proposed layout) were likely to cause interference to an existing link (Fresnel link) on the Vodafone network.

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.

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.

The impact of the proposed turbines will have a **long-term moderate negative** impact on telecommunications during the operational phase.

14.7.8 Decommissioning Phase

The electromagnetic emissions levels likely to be generated during the decommissioning phase are well below those specified in the ICNIRP 1998 Guidelines⁸ on the limit of exposure to radio frequency electromagnetic fields and electronic and magnetic fields at 50/60 Hz and in the EU Council Recommendation 1999/519/EC.

⁸ 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 at: 17/10/2024]

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

14.7.9 Mitigation Measures

All electrical elements of the Development are designed to ensure compliance with electromagnetic 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. At pre-construction phase, an Electrical Interference Assessment shall be carried out.

2rn transmission links: To address the potential risk of interference with two 2rn transmission links (Drogheda and Clermont Carn Transmitters), the developer has agreed to sign a protocol agreement with 2rn prior to construction, committing to restoring service to any end users that may have their service disrupted as a result of the proposed development. Examples of measures for restoration of service include 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.

Therefore, there will either be a **negligible** effect, or no effect, on 2rn FM link as a result of the Development.

Vodafone network: To address the likely risk of potential interference to existing link (Fresnel link) on the Vodafone network, a meeting was held with Vodafone on 31 Aug 2023 during which it was agreed to remove the two turbines likely to cause interference.

14.7.10 Residual Effects

The impact on telecommunications during construction/decommissioning is likely to have a **temporary slight negative** effect.

The proposed turbines will have a **long-term moderate negative** impact on telecommunications during the operational phase. Implementation of the measures outlined in **Section 14.7.9** will ensure that any residual impacts will be **not-significant negative and long-term** in duration.

The impact on telecommunications during the construction and decommissioning phase of the Project due to electromagnetic emissions from the Proposed Development is likely to have an **imperceptible** effect.

14.7.11 Cumulative Effects

There is 5 No. proposed, permitted or operational wind farms within 20km of the Proposed Development (see **Table 2.1, Chapter 2: Description of the Proposed Development**) which have been considered for potential cumulative effects. In line with the Draft 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. Should the permitted Kilsaran Quarry extension go ahead during the construction phase of the Proposed Development, the cumulative impact on telecommunications during this phase due to electromagnetic emissions may be increased **from imperceptible to not-significant**, due to the proximity and use of additional electrical equipment.

No tall structures or tall cranes are anticipated for use in the quarry (and the permitted extension), therefore there will be no cumulative effect from tall structures on telecommunication anticipated during the construction phase of the Project.

The cumulative effects on telecommunications are anticipated to be **not-significant** during the operational and decommissioning phases. The cumulative effects on telecommunications are anticipated to remain at **not-significant** during the construction phase.

14.7.12 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 Proposed Development.

14.8 ELECTRICITY NETWORKS

14.8.1 Introduction

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

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 12.65km in length and will be predominantly along the public roads corridor, with c.900m of the GCR in site access tracks within the Redline Boundary.

Connection will be sought from the grid system operator by application to EirGrid. The substation will connect via underground 38kV cables. At the existing Drybridge 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 SPEC-171213-AXS (Functional Specification the installation of ducts and ancillary structures for 38kV underground power cables and associated communication cables for contestable projects). See Substation Layout on **Planning Drawing 05949-DR-125-P1** and Control Building Elevations Section & Plan on **Planning Drawing 05949-DR-128-P1**.

14.8.2 Assessment Methodology

The grid connection between Kellystown Wind Farm and Drybridge 110kV Substation is proposed to be an underground cable (UGC), utilising sections of cabling in public roads, as well as private third-party lands. The total length of the connection is circa 12.65km. See **Planning Drawing: 05949-DR-101 - 05949-DR-106**. A document outlining the construction techniques and methodologies for the construction of the proposed Kellystown Wind Farm 38kV grid connection to the Drybridge 110 kV Substation, is included as **Appendix 2.3**. The construction methodologies, including watercourse and road crossings, drainage management plan and access route to work area and consideration of existing services are presented in **Appendix 2.3**.

A new 38kV Onsite Substation and Control Building will be constructed to allow for the additional capacity and to meet the specification requirements of ESB Networks.

Transport Infrastructure Ireland (TII) were consulted in the scoping process, All items raised have been addressed/ considered during the design process and is documented within **Chapter 16: Traffic and Transport**.

Subsequently, several items were raised by Transport Infrastructure Ireland (TII) and outlined in the Further Information Request issued on the 6th February 2025 by Louth County

Council. These Items have been addressed in the Further Information Request response and throughout the EIAR in **Chapter 1: Introduction, Chapter 14: Material Assets, Chapter 16: Traffic and Transport & Appendix 16.2: Construction Traffic Management Plan.**

14.8.3 Assessment of Potential Effects

As all on-site internal cabling will be underground as will the grid connection from the Onsite Substation and Control Building to the 110kV Drybridge substation, 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 the addition of electrical transmission infrastructure and through renewable energy generation.

Additionally, the internal cabling will be laid as outlined in the construction methodology for the Grid connection (**Appendix 2.3**), specifying procedures required to facilitate watercourse and road crossings, drainage management plan and access route to work area and consideration of existing services in the GCR. At the existing Drybridge 110kV Substation, the cable will connect into existing infrastructure within the confines of the substation and its compound, and thus will have a **slight brief effect** on the electrical network during the construction phase.

There will no impact on the electrical network during the operational phase or the decommissioning phase.

14.8.4 The 'Do-nothing' Impact

If the Proposed Development does not proceed, there will be no offset to fossil fuel usage, and no provision of additional electricity in the local area, thus having a moderate negative impact. The evolution of the baseline environment, which is mostly comprised of roads, is likely to be the development of existing roads and use of roads for additional services and utilities.

14.8.5 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.

14.8.6 Residual Effects

The residual impact on electricity during construction is likely to have a **slight brief negative** effect.

The residual impact on electricity during the operational phase is likely to **moderate positive and long-term**

As the electrical transmission infrastructure will remain in place, the residual impact on electricity network during the decommissioning phase is likely to be **slight positive and long-term**.

14.8.7 Cumulative Effects

There are 5 No. proposed, permitted or operational wind farms within 20km of the Proposed Development (see **Table 2.1, Chapter 2: Description of the Proposed Development**) 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 Proposed Development and surrounding projects in relation to electricity networks during the construction phase.

The cumulative effects on electricity networks are anticipated to remain **slight (negative)** during the construction phase, **positive** during the operational phase and **positive** during the decommissioning phase.

14.8.8 Statement of Significance

No significant negative impacts on the electricity networks are anticipated. There will be a **long-term moderate positive** residual impact on transmission infrastructure in the area

(due to the installation of new infrastructure). There is no impact on the distribution network, as 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.

14.9 AIR NAVIGATION

14.9.1 Introduction

Operating wind farms 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*⁹. The IAA requires that all structures over 150m in height require lighting of an obstacle¹⁰ to warn aviation traffic. The proposed turbines at Kellystown Wind Farm will have a maximum overall tip height of 180m above ground level, during operation. The maximum tip height has been assumed for the purpose of the aviation assessment, as the infrastructure height poses the greatest risk to aviation. The full range of turbine dimensions are outlined in **Chapter 2: Description of the Proposed Development, Section 2.6.2**.

Annex 15 to the Convention on International Civil Aviation Aeronautical Information Services

The following are the main aviation-related features (identified in ICAO Aeronautical Chart) with regards to distance from the Wind Farm Site near Kellystown:

- Just over 40km north of Dublin Airport;
- 35km north-east of the licensed aerodrome at Athboy, Co. Meath;
- 9.5km north-east of the unlicensed airfield at Dowth Hall, Co. Meath;
- 12km east of existing Collon wind Farm which extends to 1024ft (312 OD);

⁹ 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:17/06/2024]

¹⁰ 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:17/06/2024]

- 17km north-west of the Gormanston disused military aerodrome (current military firing range area EID1);
- 10km from the nearest aerial sporting area: hang-gliding at Dunany Point; with ballooning (at Slane, Navan, Athboy & Trim) at much greater distances;
- Under a Dublin ATC control area at ~2,450ft to 3,500ft above sea level.

The nearest international commercial airport is Dublin Airport, approximately 40km from the Proposed Development. The Wind Farm Site is outside of all “no-go” areas, built-up areas, and lies within two areas of ‘suitable for wind Development’ in the Louth County Development Plan, 2021 - 2027; *open to consideration and preferred areas*.

14.9.2 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 Proposed Development. The findings are summarised in **Table 14.3**.

Table 14.3: Summary of Consultation Response

Consultee	Response Date	Response
Irish Aviation Authority	Letter in Response to Scoping Report received: 25/05/2023	<p><i>The development appears to be approximately 38km North of Dublin Airport, as such, it is recommended that the developer engage directly with DAA Dublin Airport and the Air Navigation Service Provider AirNav Ireland to make them aware of the proposal and ensure appropriate screening from an aviation safety perspective.</i></p> <p><i>It is likely that the following general observations would be proffered by the Authority during a formal planning process:</i></p> <p><i>In the event of planning consent being granted, the applicant should be conditioned to contact the Irish Aviation Authority to:</i></p> <p><i>(1) agree an aeronautical obstacle warning light scheme for the wind farm development</i></p> <p><i>(2) provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and</i></p> <p><i>(3) notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.</i></p>
Department of Defence	Received 23/08/2023	<p><i>Having consulted with the relevant military authorities the Department wishes to make the following observations:</i></p>

Consultee	Response Date	Response
		<p>1. The minister of Defence is responsible for the regulations of military aviation, whereas the Irish Aviation Authority (IAA) is responsible for the safety regulation of civil aviation including aerodromes. The IAA does not have remit for military aviation or installations. Safeguarding of military flight operations and installations is intended to protect both current and future aircraft operations and to take account of the security requirements associated with some of these operations.</p> <p>2. The Department of Defence opposes the erection of wind farms or other obstacles which will effect the ability of the Irish Air Corps to train and operate in a safe and economic manner. Based on the information provided by Jennings O'Donovan, the proposed wind farm lies within 3NM of the M1/N1 identified as a critical route which could affect Air Corps' ability to access regional areas.</p> <p>3. If this proposed development was to go to the planning stage, the department of Defence would be obligated to raise the above concern and advise the planning authorities accordingly.</p> <p>4. Any IAA requirements including obstacle lighting are separate to Irish Aviation Authority (IAA) Requirements.</p> <p>Nothing in the above in the above observations shall be taken as a binding response by the minister for Defence in the event that a planning application is made. The minister reserves the right to comment on an actual planning application as and when it is submitted in accordance with the provisions of the planning regulatory code.</p>
Dublin Airport	N/A	No response received.
AirNav Ireland	N/A	No response received.

14.9.3 Assessment Methodology

Consultation with Air Navigation stakeholders was initiated during the scoping phase of this EIA to identify any obstacles to air navigation that could be caused by the Proposed Development. Details of the Proposed Development were shared with Dublin Airport, Irish Aviation Authority, Air Nav Ireland and The Department of Defence. A summary of responses are shown in **Table 14.3**. No responses were received from Dublin Airport and AirNav Ireland.

The response from the Department of Defence highlighted concerns, as a result an independent study was undertaken to assess these concerns, this study is summarised in **Section 14.9.4.1**.

14.9.4 Assessment of Potential Effects

The response from the Department of Defence highlighted that the Department opposes the erection of wind farms or other obstacles which will affect the ability of the Irish Air Corps to train and operate in a safe and economic manner. It was highlighted that the proximity to the M1 could potentially affect Air Corps' ability to access regional areas. The M1 is situated approximately 1.92km west of the nearest turbine in the proposed Wind Farm Site, **Figure 14.1**. In response to the highlighted potential issue, an aviation study was undertaken by Aviation Planning Consultants (O'Dwyer and Jones) on behalf of the developer to consider the conditions and requirements laid down by the Civil Aviation and Irish Aviation Authority and the Department of Defence and Air Corps. These findings showed that the distance of 1.92km between the M1 motorway and the nearest turbine, is twice the necessary International Civil Aviation Organisation (ICAO) clearance required (0.9km) either side of any visual flying route for Helicopters. The study also concluded that the Proposed Wind Farm Site was not in conflict with any current aviation requirements and complied with the Civil Aviation and IAA Best practices outlined in section 14.9.4.1.

The impact assessment concluded that no significant effects are predicted on air navigation as a result of the Development. A synopsis of this report is included in the section below. The full aviation study is located in **Appendix 14.1**.



Figure 14.1. Wind farm layout illustrating the proximity to the M1 motorway. The full aviation report is located in **Appendix 14.1**.

14.9.4.1 Synopsis of Aviation Analysis Report

In response to the raised concern by the Department of Defence (the potential of the wind turbines or other obstacles to effect the ability of the Irish Air Corps to train and operate in a safe and economic manner, including the proximity of the proposed turbines to the M1), an aviation study was undertaken by Aviation Planning Consultants on behalf of the developer to consider the conditions and requirements laid down by the Civil Aviation and Irish Aviation Authority and the Department of Defence and Air Corps. The study concluded that the Proposed Wind Farm site was not in conflict with any current aviation requirements.

Civil Aviation and IAA Best practices

ICAO (International Civil Aviation Organization): With regard to the aviation features on the ICAO Aeronautical Chart, which included Dublin airport, aerodromes, disused military aerodromes, aerial sporting locations and the Dublin ATC control area, the findings concluded that none of the aviation features will be affected by the Proposed Wind Farm site.

Civil Aviation Flight Paths: With regard to the Civil Aviation Flight Paths, the findings concluded that a flight route near the Kellystown area (EIDW-AD-2.24-12.1), which shows

2 transit routes (BAMLI & NEVRI) several thousand feet above site, will be unaffected by the Proposed Wind Farm site.

Aviation Authority Guidance¹¹, ICAO guidance¹² and EASA guidance¹³, (EU) 2018/1139 and the Aerodrome Regulation (EU) 139/2014), with regard to Wind Turbines: To comply with the Aviation Authority Guidance principal requirements, the turbines will be marked and lit, specifically related to the height, (specified as per ICAO guidance and EASA guidance) and will be identified on aviation charts.

Department of Defence Considerations

Department of Defence have expressed concerns on a previous a wind farm application (unrelated project) where proposed turbines were within 9.6km of a 'military installation' or army camp or within 37km of a Casement Aerodrome and more generally anywhere within a Military Operating Area (MOA; set up under section 68 of the IAA Act 1993). The Kellystown Wind Farm Site is outside the MOAs, as shown in the chart **Section 6.1 of Appendix 14.1**. This chart also shows that the Wind Farm Site also lies outside the 'Danger Area' surrounding Gormanstown disused military aerodrome

Distance from Military Installations: Kellystown is outside the areas of potential concerns to the Department of Defence in relation to military camps and other military installations. The nearest military installation is the former (no longer in use) aerodrome at Gormanston, which is 17km from the wind farm site.

Air Corps Flight paths: The Department of Defence and Air Corps have no military charts showing flight paths in the vicinity of the Wind Farm site. The majority of the Air Corp route are south of Dublin airport. The one current Air Corps chart (chart EIME-AD-2.24-17) shows a route to the north of Dublin (which overflies Dublin Airport at 3,000ft). This chart also shows the Gormanstown "Danger Area", from which the Wind Farm site is a considerable

¹¹ IAA, S.I. No. 266/2019 - Irish Aviation Authority (Standardised Rules Of The Air) Order, 2019 Available at: <https://www.irishstatutebook.ie/eli/2019/si/266/made/en/print>

IAA, S.I. 72/2004 - Irish Aviation Authority (Rules of the Air) Order, 2004 Available at: <https://www.irishstatutebook.ie/eli/2004/si/72/made/en/print>

¹² ICAO, Annex 14 - Aerodromes - Volume I - Aerodromes Design and Operations, Ninth edition July 2022 and ICAO, Annex 14 - Aerodromes - Volume II – Heliports, Fifth edition, July 2020

¹³ EASA (European Aviation Safety Agency) Easy Access Rules for Standardised European Rules of the Air (SERA), revision Feb 2023 Available at: <https://www.easa.europa.eu/en/document-library/easy-access-rules/online-publications/easy-access-rules-standardised-european>

distance north, beyond the extent of the Air Corps chart EIME-AD-2.24-17. This chart is present in **Section 6.3 of Appendix 14.1**.

Military Helicopter Routes above Motorways: The department of Defence have expressed concern with the 'tall object' within 3 nautical miles (5.556km) of either side of a motorway, citing that that helicopters may navigate by following motorway routes. If an area of 3 nautical miles was to be left free on either side of the motorway, there would be an 11.1km corridor along all motorways unavailable for any 'tall objects'. Based on the Aviation Analysis Report, O'Dwyer and Jones Aviation Planning Consultants do not consider this to be necessary in all cases as the Department's concerns can be appropriately managed through other methods. This is expanded upon as follows:

- The ICAO, Annex 14, Vol 2- Heliports states that the 'obstacle limitation surfaces' for helicopter Approaches and Take-offs have an overall width of 1.8km at its widest part. This is applicable to all helicopters.
- ICAO and EASA make provisions for wind turbines up to 315m in height in any location once they have the specified lighting and are marked on aviation charts
- Experienced aviation recommendations, as included in the report, have expressed that:
 - There is no legal requirement for the provision of a 11.1km corridor for helicopter navigation.
 - Such a width is considered excessive for the purpose of low-level navigation of a helicopter above a motorway
 - A width of 0.9km either side of a motorway would suffice to facilitate helicopter Approaches and Take-offs (1.8km at full width)
- Provision in aviation legislation for low-level flying of military aircraft is made only in relation to the MOAs and specific restricted and Danger Areas delineated by IAA and published in AirNav Ireland.
- Outside the MOAs Aircraft are obliged to meet the EU Aviation Safety Agency Standardised European Rules of the Air (SERA) 2020 (also contained in the IAA Rules of the Air Orders S.I.72 of 2004 & S.I. 266 of 2019 which require aircrafts to fly at specified safe heights and horizontal distances (1.8 km at full width) which are substantially less than the outlined 11.1km. These specified safe distances are within the proposed turbine locations.
- It is not possible to maintain the obstacle free corridor (11.1km) along any of the motorways or national roads as requested by the Air Corps, due to the presence of existing mast and turbines already well within this distance, along motorways or national roads (M1, N1 and N2).

- Furthermore, along other listed motorways M4, M7, M8, M8 and M50, there are tall obstacles (up to 140m in height) identified on aviation charts, lying between 1km and 5km of motorway centrelines i.e., within the 11.1km corridor.

In summary, given the ICAO and EASA specified overall width (1.8km) to facilitate helicopter Take-off and Approaches (worse case width), 0.9km clearance either side of any visual flying route is sufficient in that it provides a safe 'low level route' for military helicopters. As the Wind Farm site at its closest turbine is twice this distance (1.92km) from the M1 motorway, it is concluded that the Wind Farm site is well clear of any low level helicopter route above the M1 or the national road N1 or N2.

The report concluded that proposed the Wind Farm Site is not in conflict with any current aviation requirements.

14.9.5 The 'Do-Nothing Impact'

If the Proposed Development were not to proceed, there would be no potential impact on aviation operations in the area. The likely evolution of the baseline environment may be continued farming/ agricultural uses. It is also possible that other tall structure developments may be proposed in this region, that may have the potential to impact Aviation.

14.9.6 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 Wind Farm 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 Proposed 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 and turbines and the type of lighting.

14.9.7 Cumulative Effects

There is 5 No. proposed, permitted or operational wind farms within 20km of the Proposed Development (see **Table 2.1, Chapter 2: Description of the Proposed Development**) 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 and do encroach on flight paths. Therefore, as each project is designed and built to avoid impacts arising, therefore a cumulative impact is unlikely.

The nearest Wind Farm is 11.4km west of the Proposed Development. The Kilsaran Quarry permitted extension, if it were to go ahead will not incorporate any tall structures. For these reasons the expected cumulative impacts relating to the Proposed Development and surrounding projects in relation to aviation during the construction phase are **not-significant**.

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. Therefore, cumulative effects on aviation during the operational and decommissioning phases are considered **not significant**.

14.9.8 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 Proposed Development on air navigation are considered **not significant**.

14.10 QUARRIES RESOURCES

14.10.1 Introduction

Crushed stone required for construction of the access tracks and will be imported as outlined in **Chapter 16: Traffic and Transport**. The crushed stone, estimated to be a volume of 15,099m³ will come from a licenced quarry in the locality such as:

- Kilsaran Quarry, Gallstown, Co. Louth
- Roadstone Mullaghcrone, Co. Meath
- Breedon Quarries, Heronstown, Co. Meath

These quarries will also be the source of crushed stone and concrete for widening works to the Turbine Delivery Route, Turbine Foundations and for Grid Connection works. The locations of these quarries in relation to the Proposed Development can be seen in **Figure 16.5** in **Chapter 16: Traffic and Transport**.

14.10.2 Assessment of Potential Effects

The construction of the Proposed Development will impact on natural resources such as aggregates which will be sourced from the quarries in proximity to the Wind Farm Site (**Section 14.10.1**). This will have a **short-term slight negative** impact on natural resources for the duration of the construction phase of the Project.

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. This will have a **long-term imperceptible negative** impact on natural resources for the duration of the operational phase of the Project.

The decommissioning phase will have no requirement for stone or granular material, therefore there will be no impact on natural resources for the duration of the decommissioning phase of the Project.

14.10.3 The 'Do-Nothing Impact'

If the Proposed Development were not to proceed, there would be no impact on quarry resources in the area and quarrying activities would continue. The likely evolution of the baseline environment may be continued farming/ agricultural uses. It is also possible that other developments may be proposed in this region that require natural resource from local quarries.

14.10.4 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.
- Local quarries have been identified to reduce impact on transportation (Please see **Chapter 16: Traffic and Transport**).
- 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 10: Soils and Geology**)

14.10.5 Residual Effects

The residual impact on quarry resources during construction is likely to have a **short-term slight negative** effect. The residual impact on quarry resources during the operational phase is likely to **long-term imperceptible negative**. There will be no residual impact on quarry resources during the decommissioning phase.

14.10.6 Cumulative Effects

All existing and approved projects in **Appendix 2.4** have been considered. 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 natural quarry resources from the Proposed Development and smaller projects in the surrounds, such as one-off houses, extension to houses and housing development relation to quarries during the construction phase. The cumulative impact on quarry resources during construction is likely to have a **short-term moderate negative** effect. The cumulative impact on quarry resources during the operational phase is likely to **long-term imperceptible negative**. There will be no cumulative impact on quarry resources during the decommissioning phase.

14.10.7 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.

14.11 UTILITIES

14.11.1 Introduction

In order to assess the potential for significant effects on built services gas, water and waste in the vicinity of the Proposed Development, scoping requests were made to Uisce Éireann and Louth 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.

14.11.2 Assessment Methodology

In order to assess the potential for impacts to gas and water infrastructure and waste services, a scoping exercise was carried out with a number of key consultees, including Gas Networks Ireland (GNI), Uisce Éireann and Local Authorities. Full details of the scoping exercise that was carried out is provided in **Chapter 1: Introduction**. These key consultees were also contacted directly and provided with electronic drawing of the design layout and were requested to provide infrastructure drawings/ layout of the utilities to inform design layout. A desk study of available information from the EPA was undertaken to identify all waste facilities in the area.

14.11.3 Assessment of Potential Effects - Gas, Water Utilities

Gas: The potential impact on the domestic or commercial gas supply network has been thoroughly assessed. Gas mains are located within the Redline Boundary. A transmission gas pipeline (high pressure lines with operation pressures from 7 bar to 85¹⁴) runs along the east side of proposed infrastructure of the Wind Farm site approximately 246 m east of the nearest turbine. The location of this gas network line has been carefully considered throughout the project's development, ensuring that all proposed infrastructure and excavation works will be not take place within 10 m of this gas network line with the exception of a small communications cable communications cable for the Met Mast. GNIs advice and approval will be sought prior construction. Such works can only proceed if consent, in the form of a valid Excavation Permit is granted by GNI as advised by GNI (2020).

TLI Group conducted a survey of the Grid Connection Route. There is one distribution gas pipeline (medium pressure line with operating pressures from 100 mbar to 7 bar¹¹) laid along a section of the GCR, as shown in Grid Connection **Planning Drawing 05949-DR-101-P1_SLP**. Pipeline extends for approximately 1,060m along the GCR and has a number of

¹⁴ Gas Networks Ireland, 2020, Safety advice for working in the vicinity of natural gas pipeline https://www.gasnetworks.ie/docs/business/safety-in-the-business/Safety-Advice-for-working-in-the-vicinity-of-Gas-pipes-2021_.pdf [Accessed 15/08/2024]

overcrossing/undercrossing gas pipeline crossing, the methodology for which are shown in **Planning Drawing 05949-DR-116** and **05949-DR-117**. Additional gas ducts were identified in the additional work carried out by TLI Group (June 2025) in response to the Further Information Request. This information is outlined in the feasibility analysis was conducted on Route Option B from Drybridge 110kV Substation to R-132 **Appendix 14.2: Technical Note 3 – TLI Group** this section follows the proposed grid connection route as outlined in **Planning Drawings: 05949-DR-101 – 106**. Where existing underground services may be present all works will be carried out in accordance with the appropriate utility standards¹⁵. The Service Crossing detail design can be found in **Drawing 05949-DR-116**.

Gas Networks Ireland will be consulted prior to starting any construction works, to allow early engagement in this project. GNI have been advised of all plans to date, all communication are included in **Appendix 1.2**.

There will no impact on the gas network pipelines during the construction phase, no impact during the operational phase and no impact during the decommissioning phase.

Water: The potential impact on the water network has been thoroughly assessed. The latest water services search was conducted for the Wind Farm Site in August 2024. This search identified short sections of water mains and associated valves and fittings within the sections of the R132, L-6274 and L2275 encompassed in the Redline Boundary. No excavation works will be carried out within these sections of road, these sections of road are unaffected by the Proposed Development.

The Redline Boundary includes one section (No.12) of the TDR that will have works in third party lands and requires works of a non-temporary nature. A short section of water mains was identified in R132 within TDR no.12, however only above ground works (vegetation / hedgerow clearance) will be carried out along this section of road. This section was also shown to be free of gas networks.

The identified water services within the Redline Boundary (R132, L-6274, and L2275, L-63324, Folios LH20541F and LH23973F) are:

- Water network Junctions

¹⁵Interim Guidance to Road Authorities regarding the proposed placement of Medium or High Voltage electricity assets, including ducts, cables, and associated infrastructure under public roads. <https://assets.gov.ie/static/documents/interim-guidance-to-road-authorities-placement-of-medium-or-high-voltage-electricity-a.pdf>

- Fitting
- Water mains
- Stop Valves
- System Valve

The locations of watermains in the GCR are shown in Grid Connection **Planning Drawing 05949-DR-101-P1_SLP** to **05949-DR-106-P1_SLP**. Crossing of watermains where required will be carried as shown in **Planning Drawing 05949-DR-114-P1** (Watermain Under Crossing) and **05949-DR-115-P1** (Watermain Over Crossing). **Additional water ducts were identified in the additional work carried out by TLI Group (June 2025) as part of the Further Information Request. This information is outlined in the feasibility analysis was conducted on Route Option B from Drybridge 110kV Substation to R-132 Appendix 14.2: Technical Note 3 – TLI Group.** The Route Option B is a section the proposed grid connection route as outlined in **Planning Drawings: 05949-DR-101 – 106**. Where existing underground services may be present all works will be carried out in accordance with the appropriate utility standards¹⁶. The Service Crossing detail design can be found in **Drawing 05949-DR-116**. Prior to the construction phase, Uisce Éireann will be consulted again and advised on the project proposals, to allow Uisce Eireann to be involved in the pre-construction plans for this projects and to advise of any new developments in the water services in the area.

- From the swept path analysis of the TDR **16.3 Appendix 16.3: Swept Path Analysis undertaken by Collett (July 2025) (Appendix 16.3a: Swept Path Analysis N162 undertaken by Collett & Appendix 16.3b: Swept Path Analysis N163 undertaken by Collett)**, also summarised in **Table 2.6** of the **Chapter 2: Description of the Proposed Development**, it can be concluded that the temporary works on 11 of the **12-14** sections of the TDR will have no impact to any of the services within the TDR. The works are confined to the temporary removal of street furniture, signage, section of an island and placement of a temporary load bearing surface.

Potential impacts arising from the Proposed Development relating to existing water services have been assessed and are detailed in **Chapter 11: Hydrology and Hydrogeology** and referred to in **Chapter 5: Population and Human Health** with accompanying mitigation measures.

¹⁶ Interim Guidance to Road Authorities regarding the proposed placement of Medium or High Voltage electricity assets, including ducts, cables, and associated infrastructure under public roads. <https://assets.gov.ie/static/documents/interim-guidance-to-road-authorities-placement-of-medium-or-high-voltage-electricity-a.pdf>

There will no impact on the water infrastructure and services during the construction phase, no impact during the operational phase and no impact during the decommissioning phase.

14.11.4 Assessment of Potential Effects - Waste

There are many waste types generated from the construction and operational phase of the Project. These are general office waste, bowser waste, portaloos waste, excavated soil, washings, concrete waste and wash-out water, chemicals, fuel and oils, packaging waste and hazardous waste. Waste generated on site will be managed as per the **Appendix 2.1, CEMP: Management Plan 5: Waste Management Plan**.

A desk study of available information from the EPA¹⁷ carried out on 05-06 August 2024 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 Proposed Development are Whiteriver Landfill Site (ID W0060-03) operated by Louth County Council and Drogheda Landfill (ID W0033) operated by Drogheda Borough Council.

There are no EPA-licensed or local authority-authorized waste facilities or activities located within 2km of the EIAR Site Redline Boundary. A list of waste facilities within the vicinity of the Proposed Development has been included in **Appendix 2.1, CEMP: Management Plan 5: Waste Management Plan**. The waste disposal site and routes are displayed in **Figure 16.4**. The closest authorised municipal waste facility is:

- Nature's Way Composting Ltd (ID W0182), located 11.85km northwest in the city of Drogheda.
- Whiteriver Landfill Site (ID W0060-03) operated by Louth County Council, located 5.1km west of the Wind Farm Site
- Drogheda Landfill (ID W0033) operated by Drogheda Borough Council, located 6.2km south.
- Height for Hire Ltd (ID W0154), located 6.3km south.

Staff Facilities

During the construction, operational and decommissioning phases of the Proposed Development, there will be the typical plastic and / or "disposable" waste that might be

¹⁷ EPA dataset of current Waste facility locations, Available at: <https://gis.epa.ie/EPAMaps/> [accessed 11/09/2024]

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 prior to appropriate disposal at a licensed waste facility. The estimated range of waste generated on site per person per day will be greater in the construction and decommissioning phase than in the operational phase and is estimated to vary between 0.005kg and 0.189kg, with an average of 0.74kg¹⁸. However, this average can vary widely, from 0.11kg to 4.54kg¹⁹. The effects of this waste will be **not significant** during construction, **not significant** during decommissioning phase, and imperceptible during operational phase.

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 Drogheda Wastewater Treatment Plant and removed off site on completion of construction. Toilet waste is a non-hazardous waste. The effects will be **slight** during the construction and decommissioning phase.

The maximum wastewater production during construction is estimated to be the same as the maximum water consumption (2,000 litres per day)²⁰.

All wastewater will be tankered off-site by a licensed waste collector to the nearest wastewater treatment plant. The closest wastewater treatment plant is Drogheda Wastewater Treatment Plant located 13.2km south of Wind Farm Site via the R132 or Dundalk Wastewater Treatment Plant located 28km north via the M1 motorway. There will be no on-site treatment of wastewater and effects will be **not significant** during the construction and decommissioning phase.

Concrete

¹⁸ Based on 1 hour a day within communal facilities. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. (World Bank) Available at: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html [Accessed 24/08/2022]

¹⁹ Trends of Solid waste management. Available at: https://datatopics.worldbank.org/what-awaste/trends_in_solid_waste_management.html. [Accessed: 18/06/2024]

²⁰ Table 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 at: https://www.epa.ie/publications/compliance--enforcement/waste-water/EPA_water_treatment_manual_small-comm_business.pdf] [Accessed: 18/06/2024]

Concrete will be used during the construction phase for the construction of Turbine Foundations, Substation and Met Mast. There is no waste concrete expected from this construction work, therefore there will be no concrete waste impact during construction phase.

Concrete structures will be left in place during decommissioning and allowed to naturally revegetate over time. There are no requirements for concrete use during the decommissioning or operational phases, as such, there will be no concrete waste generated during these phases.

It is expected that 20 L – 30 L of concrete washout will be produced during the construction phase, which will be collected in designated skip(s) in a bunded area located in the designated concrete washout facility at the contractor's compound located the Site entrance to T2. This concrete waste (waste code 10 13 14; waste concrete and concrete sludge) will be disposed of at a licenced facility, as outlined in **Appendix 2.1, CEMP: Management Plan 5: Waste Management Plan**.

The effects of this waste will be **Slight negative and temporary** during construction, **imperceptible** during decommissioning phase, and **imperceptible** during operational phase.

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 14.11.7**), the residual effects will be **not significant negative and temporary** 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

Refuelling on site will only take place during the construction phase. As outlined in **Appendix 2.1, CEMP: Management Plan 5: Waste Management Plan** where possible all refuelling on site will be within the temporary compound within the re-fuelling area. Only essential refuelling (e.g., cranes) will be carried out outside of this area, and has been mitigated by design as outlined in **Section 14.11.7**. Some refuelling of cranes may be required (to a lesser extent) during the decommissioning.

As such, the residual effects are **not significant negative and temporary** during the construction phase and **not significant** during the decommissioning phase. There will be no need for refuelling during the operational phase and effects are **imperceptible**.

The storage/use of such liquids is not seen as necessary on site during the operational phase; thus, the effects are **imperceptible**.

Packaging

Packaging will be brought on site during the construction, operational and decommissioning phases and is expected to 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)²¹,

Packaging waste of 10kg of plastic per turbine blade, between 40 and 50 pallets and 50 to 60 cable drums are expected. A further estimated 400 to 500 cable drums are expected to be required for the grid cable route connection from the on-site Substation to the Drybridge 110kV Substation. Cable drum and pallet waste will be removed from site and grid route for re-use by an authorised person(s).

Plastic waste and damaged cable drums will be re-cycled at a licenced facility, as outlined in **Appendix 2.1, CEMP: Management Plan 5: Waste Management Plan**.

This waste is non-hazardous, much of which can be directly re-used (pallets and cable drums).

The effects of this waste will be **slight negative and temporary** during construction, **imperceptible** during decommissioning phase, and **imperceptible** during operational phase.

Metals

Metal (steel and iron) waste calculated on the basis of the weight of a typical modern day turbine averages 588 tons, equating to 2,940 tons for five turbines, 90% of which will be steel and iron.²² During decommissioning, it is expected that 2,646 tons of steel and iron (equivalent to 90% of the weight of the turbines) from decommissioned turbines will be

²¹ S.I. No. 282/2014 - European Union (Packaging) Regulations 2014 Available at: <https://www.irishstatutebook.ie/eli/2014/si/282/made/en/print> [Accessed 12/09/2024]

²² Wind Turbine facts sheet. Available at: <https://www.enelgreenpower.com/content/dam/enel-egp/documenti/impianti/flat-rocks-wind-farme-stage-1-project/resources/Wind%20Turbine%20Factsheet%20for%20Flat%20Rocks%20Wind%20Farm%20Stage%201.pdf>. [Accessed at: 18/10/2024]

removed. Steel will be reclaimed for re-use in future steel making production where possible; subject to future steel reclamation facility and processing. However, steel enclosed in the reinforced concrete Turbine Foundation bases will remain in-situ. The effects of leaching into the soil and water table are considered not significant due to the differential placing of steel set within the concrete foundation formations as well as the gradual nature of any natural breakdown products. This has been assessed separately in **Chapter 11: Hydrology and Hydrogeology**.

Metal waste is non-hazardous, much of which can be reclaimed and re-used. The effects of this waste on re-cycling facilities will be **imperceptible** during construction, **imperceptible** during operational phase and **moderate negative and temporary** during the decommissioning phase.

Excavated Materials

An estimated 19,134m³ of excavated materials will be required for habitat restoration, reprofiling and backfilling in accordance with the **Spoil Management Plan, Management Plan No. 4 to Appendix 2.1: CEMP**. The remaining surplus material which comprises of 10,759m³ of topsoil and 36,312m³ of Subsoil/Rock will be stored in the permanent spoil two spoil storage areas. Please see **Planning Drawing DR-P1-133** for a Cut and Fill Area and **Planning Drawing DR-P1-134** for Compound Sections - Cut & Fill Area.

Excavated materials will not be classified as waste except along the Grid Connection Route and internal cabling located in the public road. The top 100mm layer of the 13.195km x 600mm wide grid route excavation area is potentially hazardous (containing Bitumen), this equates to 791.7m³ of potentially hazardous material. This waste will be transported by an authorised waste permit holder to a licensed facility for disposal of hazardous bituminous materials (EWC code 17 03 02).

With exception to the hazardous waste (containing Bitumen) from the GCR, all excavated materials during the construction phase will be re-used/ stored on site as outlined above, thus removing the need for transport of excavated material from site and disposal at a waste facility. As such, the effect of material waste disposal during the construction phase will be **imperceptible and temporary**.

14.11.5 The 'Do-Nothing Impact'

If the Proposed Development were not to proceed, there would be no impact on the utilities or waste in the area. The likely evolution of the baseline environment may be continued

farming/ agricultural uses. It is also possible that future developments may be proposed in this region, that have the potential to impact waste services and may also require connection the existing utility (gas and water services) infrastructure.

14.11.6 Mitigation Measures - Utilities

Mitigation measures relating to existing water services have been assessed and are detailed in **Chapter 11: Hydrology and Hydrogeology** and referred to in **Chapter 5: Population and Human Health**. Confirmation of the location of water services within the grid route will be sought immediately prior to construction taking place.

The risk of working in close proximity to the gas line was taken into consideration when designing the project, the required setback distances outlined by Gas Networks Ireland (GNI) were adhered too for all site infrastructure²³, namely adherence to 2 times the turbine mast height from the nearest edge of a transmission pipeline and 10m from any excavation. Cable layout was designed to avoid any crossing of the gas pipeline excluding one communication cable from the Permanent Met Mast to the nearest Wind Turbine T04 **Planning Drawing 6918 - PL- 901**.

Pre-construction, GNI will be consulted to mark out the gas pipeline and wayleave and temporary fencing to be erected to protect the Wayleave during construction. The layout has been designed to avoid excavation work within any Wayleave where possible. However a small area of excavation is required for the communications cable for the Met Mast within the wayleave demarcation, GNIs advice and approval will be sought prior construction. Such works can only proceed if consent, in the form of a valid Excavation Permit is granted by GNI.

Pre-construction, an Electrical Interference Assessment to assess any interference from the onsite substation and associated cabling in the vicinity of the live gas network. This will be completed and submitted to GNI during at the detailed design phase. This is to assess the potential impact on the cathodic protection of the gas line. The information from this assessment will inform the internal cabling specifications.

Mitigation measures relating to gas networks are also referred to in **Chapter 5: Population and Human Health**.

²³ Gas Networks Ireland: Code of Practice for Working in the Vicinity of the Transmission Network - Procedure No: AO/PR/127- Rev 3
Date: May 2021

14.11.7 Mitigation Measures - Waste

Staff Facilities

Provision for separation of waste streams will be provided so that e.g., paper, and cardboard waste and bottles will be recycled. This waste will be appropriately stored to prevent exposure to wind, rain, and wildlife.

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 Proposed Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Proposed 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 Proposed 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 cleaned 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 Wind Farm Site or progress beyond the contractor's yard. Vehicles will also be in good working order.
- Where shuttering is required to be installed in order contain the concrete during pouring, it will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure minimal potential of leaking, These measures are the use of plastic sheeting and the use 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 works will be limited 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.

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.

Only essential refuelling (e.g., cranes) will be carried out, outside of this area but not within 65m 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.

A Chemical and Waste Inventory will be kept, as outlined in **Appendix 2.1: CEMP: Management Plan 5: Waste Management Plan**. 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 will have secondary containment when in use/out on site

All dangerous substances will be conveyed in a container that complies with the ADR²⁴. As such the manufacturer of each bowser will provide certification to contractors of the following:

- A leak-proof test certificate.
- A copy of the IBC (intermediate bulk containers) approval certificate.
- An identification plate attached to the container.

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.

Refuelling

During construction/decommissioning, all refuelling on site will be within the temporary compound within the re-fuelling area (see **Planning Drawing No. 6497-PL-901**). 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.

²⁴ ADR, 2023 (European Agreement Concerning the International Carriage of Dangerous Goods by Road).
<https://unece.org/transport/standards/transport/dangerous-goods/adr-2023-agreement-concerning-international-carriage>
Accessed 29/01/2024

Vehicles will be refuelled off-site where possible. For vehicles that require refuelling on-site, fuels will be stored in the Temporary Construction Compound and banded to at least 110% of the storage capacity of fuels to be stored.

Refuelling will take place via a mobile double skinned fuel bowser. The bowser will be a double axel refuelling trailer which will be towed to the refuelling locations by a 4x4 vehicle. The 4x4 will carry, a drip tray, spill kit and absorbent mats in case of any accidental spillages. Only designated competent personnel will refuel plant and machinery on the Wind Farm Site.

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 etc, have a commercial value and therefore there is an additional economic incentive for the appropriate re-use or recycling with the licensed waste contractor.

14.11.8 Residual Effects

The residual impact on the water infrastructure and services during the construction phase will be imperceptible, imperceptible during the operational phase and imperceptible during the decommissioning phase.

The residual impact on the gas infrastructure and services during the construction phase will be imperceptible, imperceptible during the operational phase and imperceptible during the decommissioning phase.

The residual impact on waste facilities is likely to have a **short-term not significant negative** effect during construction, a **long-term imperceptible** effect during the operational phase and **short-term not significant** effect during the decommissioning phase.

14.11.9 Cumulative Effects

All existing and approved projects in **Appendix 2.4** have been considered. All local waste facilities will be subjected to cumulative effects from any development in the source of stone for almost all developments in the area.

All Wind Farms in the area are in operational phase, therefore producing a very small amount of waste. These are likely to be in imperceptible quantities in terms of the cumulative effects on local waste facilities. If the timing of the commencement of the permitted extension to Kilsaran Quarry coincided within the timeframe of the construction Proposed Development, there would some effect on waste disposal facilities. As the Quarry is already in operational phase, there is likely to be a Not significant increase on the existing the waste disposal quantities. The largest quantity of waste requiring, to be generated from the quarry extension, is anticipated to be excavated soil. As outlined in **Section 14.11.4** all excavated soil (with exception to bituminous materials) from the construction phase of the Proposed Development will be re-used on site as per the **Appendix 2.1, CEMP: Management Plan 4: Spoil Management Plan**. Therefore, cumulative effect from excavated materials/ soils are not anticipated.

The cumulative impact on waste facilities during construction phase is likely to have a **temporary slight negative** effect. The cumulative impact on waste facilities during the operational phase is likely to **long-term imperceptible and negative** and likely to be **short-term not significant and negative** during the decommissioning phase.

14.11.10 Statement of Significance

No significant negative impacts on the water infrastructure and services are anticipated. The impact due to the Proposed Development will be **imperceptible**.

Similarly, for the Gas network infrastructure and services, the impact due to the Proposed Development will be **imperceptible**.

The residual impact on waste facilities is likely to have a **not significant** impact for all waste types identified.