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Introduction

13.1 This chapter assesses the impacts of the Proposed Development on material assets. The Proposed Development refers to all elements of the application for the construction of Knockanarragh Wind Farm. The assessment will consider the potential effects during all phases of the Proposed Development (construction, operation and decommissioning) except where it is stated otherwise.

13.2 The Proposed Development which consists of the construction of 8 No. Wind Turbines, all ancillary works in Co. Westmeath in addition to works along the turbine delivery route and the construction of an underground grid connection with a 33kV cable to a proposed 110kV substation in Clonmellon in Co. Meath. The Proposed Development will also include a section of 110kV cable between the 110kV substation and the existing overhead line. The Proposed Development will be carried out in Counties Meath and Westmeath (See **Chapter 2** of this EIAR for a full detailed description of the Proposed Development). The location of the development is shown on **Figure 13-1**.

Statement of Authority

13.3 This chapter has been prepared by Lynn Hassett, Associate EIA Co-ordinator from SLR Consulting.

- Lynn holds an MSc in Environmental Impact Assessment (2001) and a BSc (Hons) in Applied Ecology (2000). She has over 14 years' experience in the preparation, contribution to and review of Material Asset EIAR chapters, as well as in the EIA co-ordination process as a whole. She has worked in the UK and Ireland on a range of urban and rural projects including in the mixed-use development, mining and quarrying sectors.

Assessment Methodology and Significance Criteria

13.4 This chapter of the EIAR has been prepared on the basis of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). The information provided within this chapter is also informed by:

- EIA Directive 2011/92/EU as amended by EIA Directive 2014/52/EU;
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018;
- Part 10 of the Planning and Development Act, 2000 (as amended);
- Section Article 94 and Schedule 6 of the Planning and Development Regulations, 2001 (as amended);
- the requirements of the Westmeath County Development Plan 2021-2027 and the Meath County Development Plan 2021-2027;
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018); and
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).

13.5 According to the EPA 2003) Advice Notes on Current Practice:

'Resources that are valued and that are intrinsic to specific places are called 'material assets'. They may be of either human or natural origin and the value may arise for either economic or cultural reasons'.

13.6 The 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022) state that Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure.

13.7 The consideration of Material Assets will therefore include the built services such as electricity, telecommunications, gas, water supply infrastructure and sewerage as well as infrastructure in the context of roads and traffic. These items are categorised according to construction, operational and decommissioning phases of the Proposed Development.

13.8 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 6**: Land, Soils and Geology, **Chapter 7**: Water, and **Chapter 8**: Air and Climate. Peat and spoil are assessed in **Chapter 6**: Land, Soils and Geology. Amenity resources and tourism are addressed in **Chapter 4**: Population and Human Health. The cultural assets of Archaeology and Cultural Heritage are addressed in **Chapter 12**: Cultural Heritage. Given that the Turbine Delivery Route is an intrinsic part of the Proposed Development, traffic is assessed in a standalone chapter, please see **Chapter 14**: Traffic. Utilities such as water, wastewater and waste services are addressed in this chapter and in **Chapter 2**: Project Description.

13.9 This material assets impact assessment comprises the consideration of existing resources pertinent to the Proposed Development and the application area that are not addressed elsewhere in the EIAR and the likely development impacts on those resources. On this basis, this chapter addresses land use and built services and waste management. Built services are understood to refer to electricity, telecommunications, aviation, gas, water supply infrastructure and sewerage.

13.10 The Study Area for this chapter of the EIAR relates primarily to the Proposed Development Site and those dwellings and buildings on the roads immediately surrounding it, which rely on the services that could be impacted.

13.11 The provision and safeguarding of utility services is facilitated in the planning system through the County Development Plans covering the application site. The Westmeath CDP 2021-2027 contains policy objectives within its core strategy (e.g. CPO 2.15) and within Chapter 10 'Transport, Infrastructure and Energy', which contains policy objectives in Electricity / Gas, ICT and Broadband, Water Supply and Wastewater. Chapter 6 of the Meath County Development Plan 2021-2027 is an Infrastructure Strategy for the County to ensure the delivery of infrastructure services.

13.12 Development management standards are set out within both Plans to ensure the protection of the environment, including infrastructure standards, and to ensure that planning applications are assessed against the relevant policy objectives set out within the overarching Plans. For example, within Chapter 11 on Development Management Standards in the Meath County Development Plan 2021-2027, Objective DM OBJ 82 stipulates that all planning applications for wind energy projects shall be accompanied by detailed proposals for the restoration of the site after removal of the turbines and associated infrastructure. Chapter 10 of the Westmeath County Development Plan 2021-2027 contains objectives in relation to supporting and improving infrastructure. Further policy analysis is provided in the Planning Statement that accompanies this Planning Application.

13.13 The preliminary consultations held with key consultees during the EIA scoping process has also influenced the focus of the assessment contained within this chapter. In line with the

legislation and guidance cited above, the emphasis of the study is on identification of impacts that have potential to cause a significant effect on the environment.

13.14 Desk based assessments and consultation with key service providers have been undertaken to identify the physical infrastructure in the study area, which encompasses the Proposed Development Site and extends to a c. 1km radius of the red line planning boundary. In instances where the study area differs according to the specific feature under consideration this is clearly indicated in the text of the chapter.

13.15 Evaluation of the effects on the material assets considered in this chapter is based on a qualitative assessment. This qualitative assessment is based on analysis of the potential effects on the environment undertaken in the other chapters of this EIAR. This assessment also takes into account a review of all relevant literature and professional judgement in relation to the features considered. Additional information has been provided by other technical specialists working on the EIAR who have undertaken site visits and field surveys. This chapter comprehensively assesses the proposed project (which includes the outer limits of the Turbine Range as identified in **Chapter 2**). The location of turbines was the chief consideration in this chapter, focusing on ensuring that no signals were blocked by telecoms / television companies in the area and that the location of turbines did not impede aviation interests in the area. In terms of general utilities, the key consideration in assessment of potential impacts is in relation to the proposed footprint of development and general utility demands that could impact/disrupt on existing supply to the local area, and this could be assessed within the general Turbine Range given in **Chapter 2**.

Consultation and Background Work

13.16 In order to assess the potential for significant effects on built services such as gas, water and waste in the vicinity of the Proposed Development, scoping requests were made to Irish Water, Westmeath and Meath County Councils including Water Services and Environment departments. Refer to **Chapter 1**: Introduction of this EIAR for full details in relation to the EIA scoping exercise. **Table 13-1** below sets out the specific consultation feedback in relation to utility providers,

Table 13-1 Consultation Feedback in relation to Utility Providers

Stakeholder	Means of Consultation	Issue Raised
Gas Networks Ireland	Dial Before You Dig Infrastructure Map Request – Reply on 16/05/2023	No recorded gas network within your area of interest
ESB Networks	Dial Before You Dig Infrastructure Map Request – Reply on 02/06/2023	Infrastructure Map supplied covering an area to the west of Turbines 4 to 8. Further ESB infrastructure mapping is provided in Figure 13-4 based on all-island mapping supplied by ESB Networks to SLR
Uisce Eireann	Online request for infrastructure information submitted on 16/05/23	Email received 31/08/23 confirming presence of mains water supply in the local area but no waste water infrastructure
Broadcasting Authority of Ireland	Email 09/11/22	The BAI 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 windfarms into existing FM networks. Also, the proposed windfarms are not located

Stakeholder	Means of Consultation	Issue Raised
		close to any existing or planned FM transmission sites
BT Communications Ireland Ltd	Email 09/11/22	Acknowledgment of email only
Commission for Communications Regulation	Email 09/11/22	No response to date
Commission for Energy Regulation	Email 09/11/22	No response to date
Department of Defence	Email 09/11/22	No response to date
Digiweb Dublin Offices and Data Centre	Email 09/11/22	Acknowledgment of email only
Dublin Airport Authority	Email 09/11/22	Screenshot provided on 06/12/22 of the safeguarding grid indicating that the location of the proposed development is just inside the 30 nautical mile range of Dublin Airport. At this location, any obstacle greater than 600m elevation above mean sea level (AMSL) will need a formal assessment (AMSL Elevation = Site Elevation + Obstacle Height). With a stated maximum turbine height of 170.00m and an estimated land elevation of approximately 90m (+/-) at the project location, the proposed development is well below the threshold AMSL value of 600m. As a result, there is no concern with the proposed development and an Instrument Flight Procedures (IFPs) Assessment is not required. However, there are regulatory requirements that: • Any obstacles greater than 100m AMSL elevation must be notified to airspace@iaa.ie, and • A Navigation Warning light will be required
Echo IT Limited	Email 10/11/22	No response to date
Eir	Email 10/11/22	Confirmed no transmission links within the proposed area and no risk to the network
ESB Telecoms	Email 10/11/22	Acknowledgment of email only
Irish Aviation Authority	Email 10/11/22 and 22/06/2023	Acknowledgment of email Email response 23.06.2023
Irish Broadband/Imagine	Email 10/11/22	Acknowledgment of email only
Irish Telecom (now viatel)	Email 10/11/22	No response to date
Magnet Networks	Email 10/11/22	Acknowledgment of email only
Premier Broadband	Email 10/11/22	No response to date
Ripplecom	Email 10/11/22	No response to date
RTE/2RN	Email 10/11/22	The proposed windfarm outlined in your email should not affect 2rn's fixed network.

Stakeholder	Means of Consultation	Issue Raised
		There is however a risk of interference to broadcast services in the area so we would request that a protocol be signed between 2rn and the developer should the site go ahead.
Telecommunications Section, An Garda Siochána	Email 10/11/22	Acknowledgment of email only
TETRA Ireland Ltd.	Email 10/11/22	No response to date
Three	Email 10/11/22	Acknowledgment of email only
TowerCom Ltd.	Email 10/11/22	No response to date
TV3	Email 10/11/22	No response to date
Vodafone	Email 10/11/22	No response to date
Wireless Connect Ltd.	Email 10/11/22	No response to date

Land Use - Agriculture

Baseline Environment

13.17 The application area comprises a total area of 115.81 hectares. Based on Corine land cover mapping (see **Figure 13-3**), approximately 74.13 hectares of this is made up of agricultural land, primarily used for grazing.

13.18 There are some heterogenous agricultural areas in the north of the site. Land use is characterised by forest and semi-natural areas within the central portion of the application site. The land is generally flat to gently undulating, with a very gradual slope from c. 100m AOD in the west to c. 80m AOD in the east.

Assessment of Potential Effects

13.19 Turbines T1, T2, T6 and T8 are to be located within existing agricultural land and will result in the loss of 7.09 hectares of this land use.

13.20 Improved agricultural grassland is one of the most common and widespread land use types occurring in Ireland and due to its high modification by agricultural practices it is widely accepted as species poor.

The ‘Do-Nothing’ Impact

13.21 If the Proposed Development were not to proceed the agricultural land would continue to be used for grazing. It is unlikely to be developed for any other purpose.

Mitigation Measures and Residual Effects

13.22 No mitigation measures are proposed to compensate for the loss of agricultural land, which is not scarce.

Cumulative Effects

13.23 Given the relatively small-scale loss of agricultural land and the lack of other developments in the local area what will result in the loss of additional agricultural land in the local area, no potential for cumulative effects has been identified.

Statement of Significance

13.24 The small-scale loss of this agricultural land is not considered to be significant.

Land Use - Forestry

Baseline Environment

13.25 The Proposed Development Site contains approximately. 79.11 hectares of forestry. **Figure 13-3** shows this land categorised as forest and semi-natural areas according to Corine land use mapping. Forestry survey work commissioned during the design of the Proposed Development is included as **Appendix 13-1** and classes the majority of the forestry within the Proposed Development Site as commercial forestry, with a high percentage also having very good growth rates (yield class) and having good quality timber. All the forestry within the study area is privately owned.

Assessment of Potential Effect

13.26 Tree felling will be required as part of the Proposed Development. Permanent clearfelling of between 20.09 hectares (assuming Vestas turbine specification), or 19.62 hectares (assuming Siemens turbine specification) of existing forestry—comprising mostly Norway spruce, Ash, Birch and Sycamore—will need to be clear-felled for infrastructural felling purposes. The Proposed Development affects forestry for 5 out of the 8 turbine locations. **Table 13-2** below provides a breakdown of the forestry to be impacted by turbine development. Construction of access roads will also cut through a number of forestry plots.

Table 13-2 Details of Forestry Areas to be impacted by Turbine Development

Turbine	Species Mix	Plant Year	Estimated Fell Year
1	Birch and Additional broadleaves	c. 1998	N/A
3	Birch and Additional broadleaves (ADB)	c. 1998	N/A
4	Sycamore and ADB & Norway Spruce	1996/1995	2070/2035
5	Norway Spruce & Sycamore & Scots Pine	1995	2035/2070
7	Sitka spruce and Additional broadleaves	1995	2070

13.27 The forestry within the above areas is mixed in relation to quality of timber, with the majority being of good quality, high yielding and expected to produce a high-quality timber product at the end of the rotation. The forestry present in proposed locations for T1 and T3 are relatively poor and uncommercial, meaning that the trees are small in height, and that are

underlain by wet peat soils. The removal of trees of this size is far less intrusive or potentially damaging to the surrounding forestry than would be the case for larger types.

13.28 T5 is located near a sensitive area on the border of a potentially ancient woodland to the east: the development has moved T5 west to ensure hardstands, buffers and access roads will not affect the possible ancient woodland. T5 is now located in a predominantly commercial conifer woodland that has been thinned previously and will be thinned again in the future.

13.29 T4 is located in semi mature broadleaf forestry also that has been thinned previously (i.e. inferior trees have been removed to increase the quality and size of those remaining) and will be thinned again in the future.

13.30 T7 is located within a former ash plantation area that has been felled following the identification of ash dieback disease within it. It has been replanted with Sitka spruce, with additional broadleaf species planted around the edges. As a result, this plot is now very young, meaning the trees are small in height. Again, any clearance or removal of trees this size presents less risk of damage to the surrounding forestry.

13.31 The Proposed Development intends to utilise any existing forest infrastructure, such as access tracks, where these exist.

13.32 All types of forestry clearance works, will have potential for impacts including encouragement of encroaching windblow, drainage disturbance to existing drains, damage to surrounding trees during harvesting operations, leakage of sediment from the site, soil erosion/compaction. New access paths through the forest will create new forest edges not previously exposed to wind.

13.33 With clearing areas of trees the remaining forest can sometimes be disturbed depending on a number of factors (aspect, elevation, remaining tree shelter etc.). Opening areas of the forest for structures and tracks etc. may lead to some trees becoming unstable and prone to windblow. This could be a health and safety risk.

13.34 **Appendix 13-1** concludes that earlier felling of areas, whether for commercial reasons or for management of disease, is a temporal change, rather than a fundamental change of use. It also concludes that the total forestry area to be removed from existing land use within the forestry will be a small proportion of the available forestry habitat in the vicinity of the site and in the region. The proposed felling area stated is the maximum necessary to construct the Proposed Development.

13.35 Detailed information on the likely methods of forestry removal is set out within the **Appendix 13-1**, and the detailed technical assessments of the EIAR take into consideration the likely implications such as noise and water emissions as a result of the practices to be employed. With the proviso that the proposed mitigation measures are adopted and since the level of additional tree extraction is considered insignificant, no significant residual impacts are expected.

13.36 The majority of felling will be carried out within areas of commercial forestry, which is more readily replaceable and less species diverse than natural native woodlands that have formed over centuries. It will be a condition of the felling licence (if issued) that the alternative land approved for afforestation is planted and managed as forest land, in accordance with the relevant standards set out in the Forestry Standards Manual (DAFM 2023). The extent of the lands required for afforestation can only be known once planning permission has been granted, however **Appendix 13-1** proposes an area of replacement forestry to be provided as 20.09 ha (assuming Vestas turbine specification), or 19.62 ha (assuming Siemens turbine specification).

13.37 The Proposed Development will result in additional access roads being built through the forest area. Tracks that are to be installed new for vehicles will be available for future

forestry operations so that forestry vehicles can also use these roads. Roads constructed will be built to a higher specification than that normally required for timber haulage. This new access tracks to be provided may represent an opportunity for enhancement of future forestry plantation practices.

The 'Do-Nothing' Impact

13.38 If the Proposed Development were not to proceed it is most likely that the commercial forestry land would be cleared once it became viable. It is likely that the land would be used for agricultural pasture or further plantation in future. The remainder of the forestry land would be likely to remain for the foreseeable future.

Mitigation Measures and Residual Effects

13.39 Although the changes in felling and replanting plans are considered not to be significant, a number of steps will be taken to minimise any potential adverse impacts arising from the felling operations, including:

- Felling and extraction of timber will, as far as economically viable, be undertaken at the same time as currently licensed extraction activities in order to minimise traffic and noise disturbance;
- Felling and extraction of timber will only be permitted by experienced and fully trained operators;
- Tree felling will be subject to a felling licence application to the Department of Agriculture, Food and the Marine once planning permission is granted. This will outline everything proposed for the site, from areas proposed for felling and species to be planted, to fencing and fertilizer requirements and the drainage and ground preparation required to establish trees.;
- The proposed alternative land will be submitted for afforestation approval as early as possible, ideally at the same time as the felling licence application is submitted; and
- The construction methodology for tree clearance will follow the specifications set out in the Forestry Standards Manual (DAFM, 2023) and Forest Service Felling and Reforestation Policy (2017).

13.40 All Forest Service guidelines, as detailed below, will be adhered to during all harvesting activities.

- As with any forest harvesting operations, harvest plans should be designed to include timber extraction routes, fuelling and chemical storage areas, log stacking areas, access points and drain crossings etc. and should include a Hazard Identification and Risk Assessment;
- All drains crossed during extraction, if necessary, will be cleared of any debris to ensure no drainage issues will occur for the remining trees, which can be a major attributor to windblow; and
- Felling and extraction of timber will be undertaken in dry weather conditions in order to further reduce the risk of run-off and sediment mobilisation.

13.41 All timber harvesting, construction of forest tracks, including the creation of buffer zones and roadside drainage, will take into consideration the appropriate edition of the following specifications, which have been developed by the Forest Service:

- Forest Protection Guidelines,

- Forestry and Water Quality Guidelines,
- Forest Harvesting and Environmental Guidelines,
- Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures,
- Forest Biodiversity Guidelines,
- Forestry and The Landscape Guidelines,
- Forestry and Archaeology Guidelines,
- Code of Best Forst Practice – Ireland, and
- Irish National Forest Standard.

13.42 Replanting of forestry will be undertaken on 20.09 ha of land (assuming Vestas turbine specification), or 19.62 ha of land (assuming Siemens turbine specification). The replacement replanting of forestry can occur anywhere in the State, subject to licence. Potential replanting sites will be subject to a separate application.

Cumulative Effects

13.43 Given the lack of other proposals in the area identified through the cumulative projects search (see **Appendix 1-1** of this EIAR) it is not considered that there will be potential cumulative effects on forestry land uses.

Statement of Significance

13.44 Given the fact that the forestry land to be lost is replaceable, the impact on forestry land use is not considered to have a significant effect overall.

Land use – Quarries and Soils

Baseline Environment

13.45 There are several eskers running through the area, some of which show signs of having been locally used for sand and gravel extraction. There is an active quarry, immediately to the south of proposed turbine location T3. The quarry, its access road and associated lands cover c. 18.6ha and is outside the Planning Application boundary area. There are areas of former peat excavation within the Proposed Development Site, which have subsequently been planted with forestry.

13.46 Fen peat has been identified in the area of turbine locations of T1 and T3 in the Northern Cluster, through both GSI mapping and peat probing carried out by SLR. Refer to **Chapter 6** of the EIAR where there is detailed assessment on the potential for instability and mitigation measures for the avoidance of this potential. There is also an area of cut peat mapped in the south of the site, at turbine location T7. Historic aerial photography indicates that peat extraction was carried out in the area. No peat was observed here during the SLR Site walkover and peat probing.

Assessment of Potential Effect

13.47 Infill materials will be required to be brought to the Proposed Development Site in order to create pads / bases for the construction cranes, turbine bases and the construction of access tracks connecting the turbines to all associated and ancillary infrastructure.

13.48 Whilst some of the stone required for the construction of these will be sourced from quarries in the vicinity of the site, the developer has also looked at alternative options to include borrow pits within the application site from which fill material required for the construction of access roads and turbine bases may be obtained.

13.49 The use of borrow pits represent an efficient use of existing onsite resources and would eliminate the need to transport large volumes of construction materials along the local public road network to the Proposed Development Site.

13.50 **Chapter 2**: Project Description provides further detail on the location of the proposed borrow pits and the environmental effects of these have been assessed in the relevant topic specific chapters of this EIAR.

13.51 **Table 13-3** below sets out the estimated cut and fill balance for soil, aggregate and concrete materials required on site.

Table 13-3 Cut and Fill Balances of Materials Required for Site Works

Material Required	Cut (m^3)	Fill (m^3)	Import Requirement (m^3)	Balance (m^3)
Topsoil	25,776	15,204	0	10,572
Subsoil	57,535	17,168	0	40,367
Aggregate	0	0	29,880	0
Concrete	0	0	8,800	0

13.52 The required aggregates will be sourced from the on-site borrow pits as far as possible.

13.53 It is proposed that the balance of topsoils and subsoils remaining on site following creation of crane pads, turbine bases and access roads will be re-used on site for landscaping and screening purposes.

13.54 The only material that will require total importation to the site is concrete, which will be required during the construction phase of 18-24 months.

13.55 The reuse of land resources already existing within the site means that the overall impact on land availability as a result of the Proposed Development will be minimal.

13.56 During decommissioning it is proposed that the turbine foundations are left in situ, as this is also considered a more environmentally sensible option. Removing the reinforced concrete foundation associated with each turbine would result in environmental nuisances such as noise and vibration and dust. Similarly, the crane pads and access roads would be left in situ, to regenerate naturally.

The 'Do-Nothing' Impact

13.57 If the Proposed Development was not to proceed there would be no potential disturbance to the existing land resources near the application area, although it is possible that agricultural activities could intensify and result in changes to soil characteristics.

Mitigation Measures and Residual Effects

13.58 **Chapter 6** of this EIAR contains detailed mitigation measures in relation to land resource management, in particular in relation to minimising the potential for peat instability in the areas of T1 and T3. This assessment supports the conclusion of that chapter that residual effects for land from land use change will be Slight as land use will remain changed in the locality.

Cumulative Effects

13.59 There is potential cumulative effect on land resources as a result of the concurrent operation of the onsite borrow pits and development of infrastructure associated with the Proposed Development. The short term cumulative effect in terms of disturbance and changed land uses is intended, however, to result in an overall neutral effect on land resources within the application site, and to reduce the potential impact of cumulative emissions from importation of aggregates and exportation of soils and subsoils from the Proposed Development Site.

Statement of Significance

13.60 The potential impacts to land resources are not considered to be significant as it is expected that substantial balance of cut and fill of materials will be achieved on the site. In the scenario where the yield from borrow pit is not as expected, material will be brought to the site. Both scenarios are assessed in **Chapter 14**: Traffic.

Air Navigation

Baseline Environment

13.61 The nearest aeronautical infrastructure to the Proposed Development is the Snug Beag airfield, located approximately 2.8km southeast at Addinstown, Delvin, Co. Westmeath. It is not, however, listed as an airport or aerodrome designated by the Irish Aviation Authority. As can be seen on **Figure 13-2**, there are no licensed aerodromes within a 10km radius of the Proposed Development. As indicated on **Table 13-1**, the Irish Aviation Authority (IAA) has nevertheless been consulted on the proposals. The IAA has also been directly consulted in relation to the erection of a meteorological mast within the application site to test wind conditions at the site.

13.62 Consultation with the Dublin Airport Authority indicates that the location of the Proposed Development is just inside the 30 nautical mile range of Dublin Airport. At this location, any obstacle greater than 600m elevation above mean sea level (AMSL) will need a formal assessment (AMSL Elevation = Site Elevation + Obstacle Height).

Assessment of Potential Effect

13.63 Owing to their height and rotation of their blades, wind turbines have the potential to cause a variety of adverse effects on aviation.

13.64 The height of turbines can be an obstacle to communications, navigation and surveillance equipment and the rotating turbines can interfere with flight radar systems. The ground to blade tip height of the proposed wind turbines has been set at an upper limit of 180m.

13.65 With a stated maximum turbine height of 180.00m and an estimated land elevation of approximately 90m (+/-) at the project location, DAA confirmed no concern as the Proposed Development is well below the threshold AMSL value of 600m and an Instrument Flight Procedures (IFPs) Assessment is not required.

13.66 DAA however, stated that there are regulatory requirements as follows:

- Any obstacles greater than 100m AMSL elevation must be notified to airspace@iaa.ie, and
- A Navigation Warning light will be required.

The 'Do-Nothing' Impact

13.67 If the Proposed Development was not to proceed there would be no potential disturbance to aircraft within and surrounding the application area.

Mitigation Measures and Residual Effects

13.68 In line with standard practice with wind farm developments, the coordinates and elevations for turbines will be supplied to the IAA and DAA at the end of the construction phase. If aviation lighting is required by IAA or DAA to affix to the turbines, the developer commits to installing same. The applicant commits to a planning condition requiring same.

13.69 There are no aviation related mitigation measures proposed.

Cumulative Effects

13.70 Given the lack of other proposals in the area searched for cumulative projects (see **Appendix 1-1** of this EIAR) it is not considered that there will be potential cumulative effects on air navigation as a result of the Proposed Development.

Statement of Significance

13.71 The potential impacts to air navigation are not considered to be significant.

Telecommunications

Methodology and Guidance

13.72 This section of the assessment focuses particularly on the scoping and consultation exercise conducted with telecommunications operators and aviation authorities. Scoping was carried out in line with EPA guidelines[1], and the 'Best Practice Guidelines for the Irish Wind Energy Association[2]', which provides a recommended list of telecommunications operators for consultation.

13.73 Details of consultation with known telecommunications operators was undertaken and details are provided in **Table 13-1**. Telecommunications operators and aviation bodies

[1] EPA, (2022) 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'

[2] Irish Wind Energy Association, 2012

informed part of the constraints mapping process, which in turn informed the layout of the Proposed Development, as described in **Chapter 2** of the EIAR.

13.74 The following assessment methodology was applied in this assessment:

- Wide ranging consultation with all known telecommunications operators (TO's) that could potentially be affected by the Proposed Development,
- Consultation with the Irish Aviation Authority,
- Data gathering exercise to establish all known telecommunications links through consultation responses, and
- Use of data collected from the TO's, to inform constraints mapping in design of proposed development, identify separation distance of the Proposed Development from existing telecommunications links and masts and if necessary, identify mitigation measures.

Baseline Environment

13.75 During the consultation and scoping processes for the Proposed Development, searches of existing utility services were carried out to identify areas where existing major assets exist such as high-voltage electricity cables and gas mains. Private utilities and telecommunications companies were also consulted during this period to inform the proposed design.

13.76 A review of Eir mapping[3] has also been undertaken to identify the above and below ground services that are mapped for telecommunications in the study area. The services are shown to be running along the local road network.

Assessment of Potential Effect

13.77 The Irish Wind Energy Association (IWEA) 2012 guidelines, "Best Practice Guidelines for the Irish Wind Energy Industry", indicate that wind turbines within 20 km of a radio navigation aid can have the potential to cause electro-magnetic interference with these signals.

13.78 Interference to a communication system can occur in the following ways:

- Electromagnetic fields associated with the wind turbine generator,
- Signal scattering as a result of the obstruction presented by the blades, an effect that mimics the presence of a lower power source operating from the location of the wind turbine, and
- Signal obstruction as it passes through the area swept by the rotating blade or the tower.

13.79 Excavation of the cable trenches and jointing bays for Knockanarragh Wind Farm could potentially damage existing telecommunications cables. Once Knockanarragh Wind Farm is operational, the potential for a negative impact on telecommunications cables is minimal, as all infrastructure will be in a fixed location.

13.80 During the construction phase, there may be several sources of temporary electromagnetic emissions, such as through intermittent use of electrical power tools and the use of electrical generators which may be brought onsite prior to long term grid connection.

[3] https://cei.openeir.ie/ accessed 2 August 2023

13.81 These devices are required by Irish and European law to comply with the EMC Directive 2014/30/EU. Compliance with this Directive will mean that the electromagnetic emissions from these devices will not cause interference to other equipment.

13.82 Other potential effects during the construction phase are likely to be as a result of tall cranes used for constructing the turbines. As these cranes will have a similar footprint to the proposed turbines any interference effects are likely to be similar to those arising during the operational phase (see below).

13.83 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. Impacts can include reflection, diffraction, blocking and radio frequency interference.

13.84 Consultation has been undertaken with various interested parties as part of the scoping exercise. The Broadcasting Authority of Ireland confirmed that they were not aware of any issues from existing windfarms into existing FM networks and that the Proposed Development is not located close to any existing or planned FM transmission sites.

13.85 Eir also confirmed that they have no transmission links within the Proposed Development area and there is no risk to the network. A potential risk of interference to RTÉ broadcast services in the area was highlighted, however, hence a request was made for a protocol be signed between 2rn (RTÉ Networks) and the developer should the Proposed Development be permitted.

13.86 Overhead/underground Eir services where present along the road network may require diversion or be temporarily disrupted during the construction of the wind farm or cable trench. This has the potential to impact on nearby dwellings and commercial / industrial activities.

The ‘Do-Nothing’ Impact

13.87 If the Proposed Development was not to proceed there would be no potential disturbance to phone services or broadcasting/microwave links at the application area.

Mitigation Measures and Residual Effects

13.88 All aspects of the design of the Proposed Development have been developed with the aim of avoiding impacts on overhead utility infrastructure such as power and telecoms lines.

13.89 Consultation with telecommunications operators has not identified any conflicts with their infrastructure. However, as a risk of interference to broadcast services in the area has been raised by as requested by RTÉ/2rn, a protocol will be signed between 2rn and the developer should planning permission be granted for the Proposed Development.

Residual Impacts

13.90 Changes in hub height or rotor diameter do not affect the likely operational effect on telecoms operators, therefore this assessment applies irrespective of which turbine and all permutations within the range is installed. Therefore, the Proposed Development is not likely to give rise to any significant residual effects on telecommunication.

Cumulative Impacts

13.91 All known existing and Proposed Developments within the study area that could potentially generate a cumulative impact with the Proposed Development during construction, operation and decommissioning were identified and examined as part of this assessment.

The full list of development identified are contained in **Appendix 1-1** found in Volume III of this EIAR. There will be no cumulative impacts in relation to the Proposed Development and surrounding projects in relation to telecommunications given the consideration of the design and mitigation measures proposed for this development.

13.92 During the development of any large project that holds the potential to effect telecoms or aviation, the developer is responsible for engaging with all relevant Telecoms Operators and Aviation Authorities to ensure that the proposals will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the developer for each individual project is responsible for ensuring that the necessary mitigation measures are in place. Therefore, as each project is designed and built to avoid impacts arising, a cumulative impact is unlikely to arise.

13.93 Consultation with telecommunications operators and aviation bodies has been conducted in order to identify any potential effects the Proposed Development may have on telecommunications and aviation. Other existing, consented and planned Proposed Developments have also been examined for potential cumulative impacts to telecommunications and aviation. No potential cumulative impacts have been identified.

Statement of Significance

13.94 Potential effects on television and radio signals from the Proposed Development will be prevented through standard construction management measures and protocol signing, as appropriate. Therefore, the impacts on telecommunications are not considered to be significant.

Electricity Networks

Baseline Environment

13.95 During the consultation and scoping processes for the Proposed Development, searches of existing utility services were carried out to identify areas where existing major assets exist such as high-voltage electricity cables.

13.96 Mapped ESB Network data has also been consulted in order to identify the above and below ground infrastructure present in the study area. **Figure 13-4** shows the extent of services in the Proposed Development Site and the immediate surrounds.

13.97 **Figure 13-4** shows:

- High voltage overhead line which crosses the site to the north, close to the N52, and crosses the landscape in an east west direction, and
- there is a network of low and medium voltage transmission lines throughout the surrounding local area, predominantly running along the public road network and connecting local residents and agricultural developments with the national grid supply.

Assessment of Potential Effect

13.98 The above and underground electricity supply infrastructure will need to be safeguarded during construction and decommissioning of the Proposed Development. It is intended to connect the Proposed Development in its entirety to the national network, to facilitate the transfer of electricity generated from the wind turbines to areas of demand. This will be

facilitated through an underground 33kV cable route to be constructed as part of the Proposed Development (details provided in **Chapter 2**). This cable route will connect the wind turbines to a proposed 110kV substation to the west of Clonmellon village, in the vicinity of the existing high voltage transmission line infrastructure.

13.99 There will be single lane closure on the N52 for short sections to facilitate c. 3.85km underground cable trenching within the L6821. **Chapter 14**: Traffic provides an assessment of the traffic impacts of all aspects of the Proposed Development.

13.100 The specifications for cables and cable installation will be in accordance with EirGrid requirements. A description of cable installation works is found within the CEMP which is contained in **Appendix 2-2** of this EIAR.

13.101 National grid connection will be sought from the grid system operator by application to EirGrid. The Grid Connection will be constructed to the requirements and specifications (CDS-GFS-00-001-R1) of EirGrid.

13.102 The Proposed Substation will be taken in charge by ESBN /EirGrid upon completion and should be left in place forming part of the national electricity network.

13.103 Ongoing engagement with Eirgrid and ESB Networks throughout the detailed design and implementation of the Proposed Development will ensure that there are no unacceptable impacts to existing utilities such as overhead and underground powerlines close to existing ESB infrastructure (in particular where proposed turbines are close to these such as in the case of T6 and T7). Detailed consultation and collaboration will continue between the applicant, Eirgrid and ESB networks to ensure that any movement or undergrounding of existing infrastructure is authorised and carried out with minimal disruption power supply in the local or wider area. Any temporary disturbances will be planned and communicated with those impacted well in advance of works being carried out.

13.104 All of the above works will be undertaken in accordance with standard accepted ESB construction management procedures.

The ‘Do-Nothing’ Impact

13.105 If the Proposed Development was not to proceed there would be no potential disturbance to electrical supplies within and surrounding the application area. However, there would not be an opportunity for this site (with its identified wind resource available) to contribute to the safeguarding of the national electricity supply which can no longer rely on fossil fuel sources.

Mitigation Measures and Residual Effects

13.106 All aspects of the design of the Proposed Development have been developed with the aim of avoiding impacts on overhead utility infrastructure such as power and telecoms lines.

13.107 Standard construction management measures will ensure that underground and overhead ESB Networks infrastructure will be safeguarded during construction and decommissioning.

Cumulative Effects

13.108 Given the lack of other proposals in the area identified within the cumulative projects search (see **Appendix 1-1** of this EIAR) it is not considered that there will be potential cumulative effects on electricity supply in the short term. When looking at the national context, the Proposed Development in tandem with other national wind energy projects will have positive cumulative impacts in terms of enabling a transition to renewable energy sources.

Statement of Significance

13.109 The potential impacts to short term energy supply are not considered to be significant. The potential contribution of the Proposed Development to contributing to the long term security of energy and reduced dependence on fossil fuels is considered to be significant, particularly given the need and lack of existing resource within the Counties of Westmeath and Meath as set out in **Chapter 3**: Alternatives.

Gas Services

Baseline Environment

13.110 During the consultation and scoping processes for the Proposed Development, searches of existing utility services were carried out to identify areas where existing major assets exist such as high-voltage electricity cables and gas mains. Private utilities and telecommunications companies were also consulted during this period to inform the proposed design.

13.111 Gas Networks Ireland have confirmed that there is no recorded infrastructure within the area of the Proposed Development.

13.112 GNI Dial Before You Dig mapping[4] has been consulted and shows that the closest transmission line is approximately 17km north at Virginia). The closest distribution pipeline is approximately 6km north. Therefore, the potential impact on gas services has not been considered further in this EIAR.

Water Supply and Sewerage

Baseline Environment

13.113 During the consultation and scoping processes for the Proposed Development, searches of existing utility services were carried out to identify areas where existing major assets exist such as water supply and wastewater infrastructure is located.

13.114 Water supply in the application area is provided through the Ballany Public Drinking Water Supply scheme. **Chapter 7** of this EIAR provides details of private well and abstraction sites in the surrounding region that are available in national database records.

13.115 There is no mains sewerage infrastructure present within the Proposed Development Site.

Assessment of Potential Effect

13.116 Underground services such as those relating to the private water supply scheme may require diversion or be temporarily disrupted if they are crossed during the construction of the wind farm or cable trench. This has the potential to impact on nearby dwellings and commercial / industrial activities.

[4] https://www.gasnetworks.ie/home/safety/dial-before-you-dig/

13.117 Potable water for workers will be imported to the application site for all stages of the Proposed Development. Portaloo infrastructure will be imported to site to cater for waste water management required for site workers.

The 'Do-Nothing' Impact

13.118 If the Proposed Development was not to proceed there would be no potential disturbance to water supply or wastewater infrastructure within and surrounding the Proposed Development Site.

Mitigation Measures and Residual Effects

13.119 Where excavations will be required in areas close to roads and in known areas of water supply and wastewater infrastructure, cable detection tools, ground penetrating radar, and slit trenches will be used as appropriate to find the exact locations of existing services. Temporary warning signs will be placed where necessary. The final locations of the cable routes within the public roads and on the verge along the public road will be selected following these investigatory works to minimise conflicts with other services. A minimum separation distance of 300 mm will be maintained with existing services.

13.120 There will be no long-term impacts to water supply or wastewater infrastructure as a result of the Proposed Development.

Cumulative Effects

13.121 Given the lack of other proposals in the area identified within the cumulative projects search (see **Appendix 1-1** of this EIAR) it is not considered that there will be potential cumulative effects on water infrastructure as a result of the Proposed Development.

Statement of Significance

13.122 The potential impacts to water supply and wastewater are not considered to be significant.

Waste Generation / Management

Baseline Environment

13.123 As the application site is currently predominantly in use for agriculture and forestry uses there is no formal waste management procedure in place.

Assessment of Potential Effect

13.124 The construction and demolition phases of the Proposed Development will result in the generation of standard construction waste.

13.125 Any waste that is generated during these phases will be collected, separated and stored in dedicated receptacles at the temporary compounds during works. It is the responsibility of the contractor for these phases (when they are appointed) to nominate a suitable site representative (such as a Project Manager or Site Manager) as the Waste Manager who will have overall responsibility for the management of waste. The Waste Manager will have overall responsibility to instruct all site personnel including subcontractors to comply with on-site requirements.

13.126 Construction / demolition style waste will be collected for disposal by the following authorised contractors:

- Allied Recycling, Clonmellon, Co Westmeath, and
- Turmec Teoranta, Athboy, Co. Meath.

13.127 Operational waste will be limited but will be managed in accordance with the Operator's standard practices and will be collected for disposal by the following authorised contractors:

- Turmec Teoranta, Athboy, Co. Meath, and
- Wallace Waste, Mullingar, Co. Westmeath.

The 'Do-Nothing' Impact

13.128 Informal waste management from agricultural and forestry sources would continue at the application site should the Proposed Development not proceed.

Mitigation Measures and Residual Effects

13.129 The Construction Environmental Management Plan will continue to be updated with specific measures to reduce, reuse and recycle waste during construction of the Proposed Development.

Cumulative Effects

13.130 Given the lack of other proposals in the area searched for cumulative projects (see **Appendix 1-1** of this EIAR) it is not considered that there will be potential cumulative effects on waste generation / management as a result of the Proposed Development.

Statement of Significance

13.131 The potential waste impacts of the Proposed Development are not considered to be significant. The contribution of the proposals to a transition to a green economy are considered to be beneficial to an overall move to reduce waste in society.

Figures

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665000

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770000

765000

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T1

T2

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T4

T5

T6

T7

T8

MEATH

WESTMEATH

Kilskyre

Ionmellon

Killua Castle Deer Park

Delvin

Athboy

Drumcree

Kells Hill

Noggan Hill

The Furze

Gurley Bog

Bog Wood

Oldcastle

Castlepollard

Kells

Navan

Trim

Mullingar

R154

N52

N51

R395

L1516

L1546

L1456

L5510

M4

0

2

4

Kilometres

LEGEND

Proposed Development Site Boundary

Proposed Turbine Location

Existing High Voltage Transmission Line

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KNOCKANARRAGH WIND FARM
ENVIRONMENTAL IMPACT
ASSESSMENT REPORT

MATERIAL ASSETS

SITE LOCATION

FIGURE 13-1

Scale 1:50,000 @ A3

Date MARCH 2024

02036.00812.0080.0 Site Location Plan

625000 650000 675000 700000

800000

775000

Ballyjamesduff Airstrip

Lough Sheelin Airstrip

Clonkeiffy Farm Airstrip

Granard Airfield

Navan Airfield

Dowth Hall Airfield

Ballyboy Airfield

Athboy Aerodrome

Snug Beag Airfield

Abbeyshrule Aerodrome

Trim Aerodrome

Trevet Airfield

Dunslaughlin Airstrip

Milltownpass Airfield

Taggarts Airstrip

Kilbrook Airstrip

Moyglare Airfield

0 5 10

Kilometres

N

LEGEND

Proposed Development Site Boundary

Proposed Development Site Boundary 20 Nautical Miles Buffer

Airport

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KNOCKANARRAGH WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT REPORT

MATERIAL ASSETS

AVIATION INTERESTS IN THE VICINITY OF THE PROPOSED DEVELOPMENT

FIGURE 13-2

Scale 1:300,000 @ A3

Date MARCH 2024

02036.00812.0127.0 Aviation Interests in the Vicinity of the Proposed Development

662000
664000
666000
768000
766000

T1
T2
T3
T4
T5
T6
T7
T8

MEATH
WESTMEATH

Clonmellon
N52
Killua Castle Deer Park
County Meath
County Westmeath

N

0
0.5
1
Kilometres

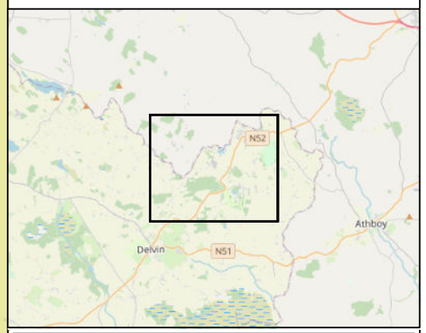
LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Layout
- Proposed Cable Route
- Proposed Substation Location
- Existing High Voltage Transmission Line
- County Boundary

Corine Land Cover (2018)

- 211 Non-irrigated Land
- 231 Pastures
- 243 Land Principally Occupied by Agriculture with Areas of Natural Vegetation
- 311 Broad-leaved Forest
- 313 Mixed Forest
- 324 Transitional Woodland Scrub
- 423 Intertidal Flats

Note
Error on Corrine Land Cover data for Clonmellen. From site experience should be classified as 118 Artificial Surface.



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KNOCKANARRAGH WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT REPORT

MATERIAL ASSETS

LAND USE SURROUNDING THE APPLICATION SITE

FIGURE 13-3

Scale	Date
1:20,000 @ A3	MARCH 2024

02036.00812.0124.0 Land Use Surrounding the Application Site

662000

664000

666000

768000

766000

02036.00812.0128.0 ESB Infrastructure in and around the Application Site

N

T1

T2

T3

T4

T5

T6

T7

T8

Lough Shesk Cross Roads

Killua Castle Deer Park

Carnaross

N52

N51

Athboy

Delvin

0 0.5 1

Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Layout
- Proposed Cable Route
- Proposed Substation Location
- Existing High Voltage Transmission Line
- Existing Low and Medium Voltage Transmission Line

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MATERIAL ASSETS

ESB INFRASTRUCTURE IN AND AROUND THE APPLICATION SITE

FIGURE 13-4

Scale 1:20,000 @ A3

Date MARCH 2024

Appendices

Appendix 13-1: Forestry Report

(Refer to EIAR Volume III for Appendices)