

Non-Technical Summary

Borrisbeg Renewable
Energy Development -
EIAR, Co. Tipperary.



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1. NON-TECHNICAL SUMMARY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Buirios Ltd, to accompany an application for planning permission for the construction of a wind farm located at Borrisbeg and adjacent townlands, near Templemore town in Co. Tipperary (the Proposed Wind Farm).

The Proposed Wind Farm meets the threshold for Strategic Infrastructure Development (SID) set out in the Seventh Schedule of the Planning and Development Acts 2000, as amended and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development in accordance with Section 37E of the Planning and Development Acts 2000, as amended.

For the purpose of this EIAR:

- > The **‘Proposed Wind Farm’** relates to the 9 no. turbines and supporting infrastructure (detailed description provided in Chapter 4 of this EIAR), and it is the subject of this planning application under Section 37E of the Planning and Development Act 2000, as amended.
- > The **‘Proposed Grid Connection’** relates to the on-site 110kV substation and temporary construction compound, underground cabling connection to the existing 110kV Ikerrin to Thurles overhead line (OHL) and 2no. new end mast towers breaking the existing OHL. The Proposed Grid Connection will facilitate the connection of the Proposed Wind Farm to the national electricity grid and will be subject of a separate planning application under Section 182A of the Planning and Development Act 2000, as amended.
- > The **‘Proposed Project’** for the purposes of this EIAR comprises the Proposed Wind Farm and the Proposed Grid Connection, all of which are located within the EIAR Study Boundary (the **‘Site’**) measuring approximately 650 hectares.

The Proposed Wind Farm will have a potential generating capacity of greater than 50 megawatts (MW) and requires the provision of 110 kV infrastructure which will form part of the national electricity transmission network, therefore, two separate planning applications are required.

This planning application is being submitted to An Bord Pleanála (ABP) seeking permission for the Proposed Wind Farm. The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Act 2000, as amended (being *‘An installation for the harnessing of wind power for energy production (a wind farm) with more than 25 turbines or having a total output greater than 50 megawatts’*) and is therefore being submitted directly to An Bord Pleanála as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Act 2000, as amended. This approach has been confirmed following consultations with the Board under the provisions of Section 37B of the Planning and Development Act 2000, as amended (case reference ABP-315851-23).

This EIAR accompanies the planning application for the Proposed Wind Farm submitted to ABP. The planning application is also accompanied by a Natura Impact Statement (‘NIS’). The Proposed Grid Connection will not form part of this planning application; however, it is assessed in this EIAR as part of the Proposed Project.

Should the planning application submitted to ABP under Section 37E of the Planning and Development Act 2000, as amended, receive successful grant of planning permission, a second planning application for the Proposed Grid Connection will be submitted to ABP in accordance with Section 182A of the Planning and Development Act 2000, as amended. A Section 182A pre-application consultation has commenced for this application (case reference ABP -317089-23).

This EIAR complies with the EIA Directive of 2011/92/EU. The Environmental Impact Assessment (EIA) of the Proposed Project will be undertaken by An Bord Pleanála, as the competent authority.

Applicant

The applicant for the Proposed Wind Farm, Buirios Ltd, is an associate company of Enerco Energy Ltd., which is an Irish-owned, Cork-based company with extensive experience in the design, construction and operation of wind energy developments throughout Ireland, with projects currently operating or in construction in Counties Cork, Kerry, Limerick, Clare, Galway, Mayo and Donegal.

By Q4 2023, Enerco associated companies had over 875 Megawatts (MW) of wind generating capacity in commercial operation or in construction, with a further c.400MW of projects at various stages in its portfolio to assist in meeting Ireland's renewable energy targets.

Brief Description of the Proposed Project

The full description of the Proposed Project is detailed in Chapter 4 of this EIAR. The current planning application, relating to Proposed Wind Farm, is being made to An Bord Pleanála under Section 37E of the Planning and Development Act 2000, as amended. The development description for the current planning application for the Proposed Wind Farm as appears in the public notices is as follows:

The proposed development will consist of the provision of the following:

- i. 9 no. wind turbines with an overall turbine tip height of 185 metres; a rotor blade diameter of 163 metres; and hub height of 103.5 metres, and associated foundations and hard-standing areas;*
- ii. A thirty-year operational life of the wind farm from the date of full commissioning of the wind farm and subsequent decommissioning;*
- iii. Underground electrical cabling (33kV) and communications cabling;*
- iv. A temporary construction compound;*
- v. A temporary security cabin;*
- vi. A meteorological mast with a height of 30 metres and associated foundation and hard-standing area;*
- vii. A new gated site entrance on the L3248;*
- viii. Junction accommodation works and a new temporary access road off the L3248, to facilitate turbine delivery to the site;*
- ix. Upgrade of existing site tracks/ roads and provision of new site access roads, junctions and hardstand areas.*
- x. Upgrade of the existing L7039/L70391 junction for secondary site access off the L70391;*
- xi. A borrow pit;*
- xii. Spoil Management;*
- xiii. Tree felling;*
- xiv. Site Drainage;*
- xv. Biodiversity Enhancement Plan (including restoration of a segment of the Eastwood River, and planting of natural woodland and hedgerow);*
- xvi. Operational Stage site signage; and*
- xvii. All ancillary works and apparatus.*

The application is seeking a ten-year planning permission.

The Proposed Grid Connection, which will be subject to a separate planning application under Section 182A of the Planning and Development Act, 2000 (as amended) is entirely located within the townlands of Strogue and Clonmore, Co. Tipperary, and will consist of the following:

1. *1 no. permanent 110kV substation compound (2 no. control buildings with welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, wastewater holding tank, site drainage and all ancillary works);*
2. *a temporary construction compound;*
3. *2km underground 110kV electrical cabling route (including joint bays and watercourse crossings) which will run through the L-7039 road and new track through agricultural land; and*
4. *2 no. new end masts that will break the existing Ikerrin to Thurles 110kV OHL.*

As part of the Proposed Wind Farm design, it is intended to restore a segment of the Eastwood River. It is proposed to restore appropriate pattern, profile and dimension to the channel with a view to improving stability of the channel and restoring in stream habitat. It is also proposed to establish a natural wooded riparian buffer and plant approximately 1.8 hectares of natural woodland either side of the River. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan for details.

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Wind Farm will have an operational lifespan greater than the 30-year operational life that is being sought as part of the planning application.

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. Turbines of the exact same make, model and dimensions can have different generating potential depending on the capacity of the electrical generator installed in the turbine nacelle. The exact generating capacity of the installed turbine will be designed to match the wind regime on the Site and will be determined by the selected manufacturer. For the purposes of this EIAR, a rated generating capacity of 7 MW has been chosen to calculate the potential capacity of the proposed 9-turbine renewable energy development, which would result in an estimated installed capacity of 63 MW. Therefore, on this basis, the proposed 9 no. wind turbines would have a combined generating capacity of 63MW. Irrespective of the power output of the actual final turbine procured, the conclusions of the EIAR will not be materially affected.

Need for the Proposed Project

Ireland faces significant challenges to its efforts to meet EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. Further detail can be found in Chapter 2 of this EIAR.

The Proposed Project provides the opportunity to capture an additional part of County Tipperary's valuable renewable energy resource. If the Proposed Project were not to proceed, this opportunity would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

Economic Benefits

The Proposed Project will have both long-term and short-term benefits for the local economy including income to local landowners, job creation, work opportunities for local businesses and service providers, local authority commercial rate payments and a Community Benefit Scheme.

Commercial rate payments from the Proposed Project will be provided to Tipperary County Council each year and to Tipperary County Council during the construction phase, which will be redirected to the provision of public services within Co. Tipperary. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the Proposed Project has the potential to create up to 100 jobs during the construction phase and 3-4 jobs during operational and maintenance phases of the Proposed Project. During construction, additional indirect employment will be created in the region through the supply of services and materials to the renewable energy project. There will also be income generated by local employment from the purchase of local services i.e. travel, goods and lodgings.

Should the Proposed Project receive planning permission, there are substantial opportunities available for the local area in the form of Community Benefit Funds. The value of this fund will be directly proportional to the installed capacity and/or energy produced at the site and will support and facilitate projects and initiatives including youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Purpose and Structure of this EIAR

The purpose of this EIAR is to document the current state of the environment on and in the vicinity of the Site and to quantify the likely significant effects of the Proposed Project on the environment. The compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the Proposed Project. The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. The chapters of this EIAR are as follows:

1. *Introduction*
2. *Background to the Proposed Project*
3. *Considerations of Reasonable Alternatives*
4. *Description of the Proposed Project*
5. *Population and Human Health*
6. *Biodiversity*
7. *Ornithology*
8. *Land, Soils and Geology*
9. *Hydrology and Hydrogeology*
10. *Air Quality*
11. *Climate*
12. *Noise and Vibration*
13. *Archaeological, Architectural and Cultural Heritage*
14. *Landscape and Visual*
15. *Material Assets (including Traffic and Transport, Utilities, Waste Management, Telecommunications and Aviation)*
16. *Vulnerability of the Project to Major Accidents and Natural Disasters*
17. *Interactions of the Foregoing*
18. *Schedule of Mitigation and Monitoring Measures*

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive and this EIAR and the NIS will accompany the planning application to the Board for the Proposed Wind Farm under Section 37E of the Planning and Development Act 2000, as amended.

Background to the Proposed Project

This section of the EIAR sets out the energy and climate change related policy and targets along with the strategic, regional, and local planning policies relevant to the Proposed Project. It also summarises EIA scoping undertaken, and the cumulative impact assessment process undertaken.

The policies and targets which have been put in place at the various levels of Government in relation to renewable energy and climate change illustrate the need for the Proposed Project to assist Ireland in meeting its national targets and European commitments in relation to climate change and decarbonisation.

The Proposed Project comprises the provision of a wind farm of 9 no. wind turbines with a tip height of 185 metres (m) and an estimated installed generating capacity of 63MW (assuming a rated output of 7MW per turbine) including associated infrastructure. The need to decarbonise the economy and reduce emissions has always been imperative, however in recent years the urgency involved has become clearer to all stakeholders. The Climate Action Plan (CAP) published by the Government in 2023 sets out the detail for taking action to achieve a 51% reduction in overall greenhouse gas emissions by 2030, and to reach net-zero emissions by no later than 2050. Central to this is the set of measures set out to increase the proportion of renewable electricity to up to 80% by 2030 and a target of 9GW from onshore wind. The CAP places front and centre the facts that without urgent action, global warming is likely to be more than 2°C above pre-industrial levels, threatening the health and livelihoods of people across the globe. Urgency of action is also a key focus of the CAP. All sectors will have to further their efforts from those outlined in the CAP if the core and further measures are to be achieved. At the time of writing CAP 2024 is due for publication before the end of 2023.

A gradual shift towards increasing our use of renewable energy is no longer viable. There is an urgency now to ensure real change happens. Renewable energy development is recognised as a vital component of Ireland's strategy to tackle the challenges of combating climate change and ensuring a secure supply of energy. Ireland is heavily dependent on the importation of fossil fuels to meet its energy need. 70% of energy used in Ireland is imported from abroad, higher than the EU average of almost 60% (National Energy Security Framework 2022). This high dependency on energy imports is highly risky and Ireland is currently extremely vulnerable both in terms of meeting future energy needs and ensuring price stability. As such, expanding indigenous renewable energy supply is critical for energy security and price stability.

Local Policy

The site of the Proposed Project is located in the administrative area of Tipperary County Council. As such, the Tipperary County Development Plan 2022-2028 ("TCDP") which came into effect on the 22nd of August 2022 is relevant. The TCDP incorporates the aims, objectives, policies and guidelines to provide for the proper planning and sustainable development of County Tipperary.

The TCDP outlines the ambition for the development of the county's renewable energy supply. Chapter 10 of the TCDP, Renewable Energy and Bioeconomy, provides renewable energy targets out as far as 2028. The TCDP has set a target of 600MW of wind energy to be constructed and operational by 2028. The county currently has 475MW of wind energy installed. The Proposed Project will contribute substantially to meeting this target.

The Tipperary Renewable Energy Strategy (RES) was published in 2016 and is incorporated into the TCDP 2022-2028 as Appendix 2 of Volume 3. The RES has been developed as a planning framework to support the implementation of renewable energy in the county. Map 11 in the RES presents The Wind Energy Policy Areas map for Co. Tipperary. The map is developed based on the Landscape Character Assessment map for the County as well slope ranges, land cover based on CORINE 2012 data, soil classification and primary amenity areas designation. The map identifies areas where wind energy

development is ‘*Open for Consideration*’ and where wind energy developments are considered ‘*Unsuitable*’.

The Site is located within an area classified as “*Open for Consideration for New Wind Energy Development*” for wind energy development within the TCDP. The Proposed Project is therefore considered wholly in line with local, regional and national policy in the provision of renewable energy.

The TCDP provides for the development of indigenous energy resources, with an emphasis on renewable energy supplies. The Council acknowledges the importance of renewable energy in reducing anthropogenic greenhouse gas emissions and the contribution of renewable energy in achieving national and EU target net zero greenhouse gas emissions by 2050.

The Draft Tipperary County Council Local Authority Climate Action Plan 2024-2029¹ (LACAP) highlights the current state of climate action in Ireland, and how Tipperary County Council intends to deliver and enable climate action for a just transition to a low carbon and climate resilient future within County Tipperary. The LACAP will help address the mitigation of greenhouse gases, the implementation of climate change adaptation measures, and will strengthen the alignment between national climate policy and the delivery of effective local climate action. The LACAP for Tipperary assesses climate risk relevant to Ireland and to County Tipperary, this, plus the evidence baseline, inform the climate objectives and actions that will be undertaken by Tipperary County Council to assist in the achievement of national and international climate targets.

Wind Energy Development Guidelines

The relevant considerations under the ‘Wind Energy Development Guidelines for Planning Authorities’ (Department of the Environment, Heritage and Local Government (DOEHLG, 2006) ‘the 2006 WEDGs hereafter, have been taken into account during the preparation of this EIAR.

The aim of these guidelines is to assist the proper planning of wind power projects in appropriate locations around Ireland. The 2006 WEDGs highlight general considerations in the assessment of all planning applications for wind energy. They set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. They contain guidelines to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. Each wind project has its own characteristics and defining features, and it is therefore impossible to write specifications for universal use. Guidelines should be applied practically and do not replace existing national energy, environmental and planning policy. While the 2006 WEDGs remain the relevant guidelines in place at the time of lodgement, and decision makers (Planning Authorities and An Bord Pleanála) are required to have regard to them, they are not bound to apply their provisions and they can (and do), where there is sufficient justification, consider updated standards/requirements/specifications in assessing impacts and the proper planning and sustainable development of the area.

Planning History

Chapter 2 Section 2.5 presents an overview of the planning history of the Proposed Project site.

Scoping and Consultation

Chapter 2 Section 2.6 presents detail of the EIA Scoping undertaken with regards the Proposed Project. A scoping report, providing details of the Proposed Project, was prepared by MKO, and circulated in October 2022 and April 2023. MKO requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIAR process. As part of the constraints mapping

¹ Draft Tipperary County Council Local Authority Climate Action plan 2024-2029.

<https://consultations.tipperarycoco.ie/sites/default/files/2023-09/Draft%20Local%20Authroity%20Climate%20Action%20Plan%202024%20-%202029.pdf>

process, which is detailed in Section 3.2.5.1 of Chapter 3 of this EIAR, telecommunications operators were contacted in May 2022 in order to determine the presence of telecommunications links either traversing or in close proximity to the Proposed Wind Farm site. The Chapter includes a list of scoping consultees and responses received, with full copies of all scoping responses received set out in Appendix 2-2 of the EIAR.

Community engagement has been undertaken by the Applicant, details of which can be found in Appendix 2-3 of the EIAR. In summary, the report was prepared to record the consultation carried out with the local community in respect of the Proposed Project. The applicant has carried out consultation in relation to the Proposed Project with local residents and interested parties in the wider community. The objective of the consultations was to ensure that the views and concerns of all were considered as part of the Proposed Project design and EIA process.

The Proposed Project has the potential to have significant benefits for the local economy, by means of job creation, landowner payments and commercial rate payments. An important part of any renewable energy development, which Buirios Ltd. has been at the forefront of developing, is its Community Benefit Package as discussed in section 1.1 above.

Chapter 2 Section 2.7 also includes details of the pre-planning meetings undertaken prior to the planning application being lodged, including engagement with An Bord Pleanála under the provisions of Section 37B (and 182E) of the Planning and Development Act 2000, as amended.

Cumulative Impact Assessment

The EIA Directive and associated guidance documents state that as well as considering any direct, indirect, secondary, transboundary, short-, medium-, and long-term, permanent and temporary, positive and negative effects of a proposed development or project (all of which are considered in the various chapters of this EIAR), the description of likely significant effects should include an assessment of cumulative impacts that may arise. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to a proposed development or project. The factors to be considered in relation to cumulative effects include population and human health (including Shadow Flicker), biodiversity, ornithology, land, soil, water, air, climate, noise and vibration, material assets, landscape, cultural heritage and major accidents and natural disasters as well as the interactions between these factors.

To gather a comprehensive view of cumulative impacts on these environmental considerations and to inform the EIA process being undertaken by the consenting authority, each relevant chapter within this EIAR includes a cumulative impact assessment where appropriate.

The potential for cumulative impacts arising from other plans and/or projects has therefore been fully considered within this EIAR. The cumulative impact assessment of projects has three principle aims:

- To establish the range and nature of existing and approved plans and/or projects within the cumulative impact study area of the Proposed Project.
- To summarise the relevant plans and/or projects which have a potential to create cumulative impacts.
- To identify the plans and/or projects that hold the potential for cumulative interaction within the context of the Proposed Project and discard plans and/or projects that will neither directly or indirectly contribute to cumulative impacts.

Assessment material for this cumulative impact assessment was compiled on the relevant plans and/or projects within the various study areas of each discipline for the Proposed Project. The material was gathered through a search of relevant online Planning Registers, reviews of relevant EIAR (or historical EIS) documents, planning application details and planning drawings, and served to identify past and future plans and/or projects, their activities and their environmental impacts.

Geographical boundaries within which there may be potential for cumulative impacts to arise, relative to each individual EIAR topic (i.e. each chapter) is set out within the Chapter. To gather a comprehensive view of cumulative impacts within the cumulative study area and to inform the EIA process being undertaken by the competent authority, each relevant chapter within the EIAR addresses the potential for cumulative effects where appropriate and within the context of their identified cumulative study area. A long list of all plans and/or projects considered by each of the different disciplines in their cumulative impact assessment are included in Appendix 2-1 of the EIAR.

1.3 Consideration of Reasonable Alternatives

This chapter of the EIAR introduces the reasonable alternatives studied by the Developer which are relevant to the Proposed Project and its specific characteristics and an indication of the main reasons for the option chosen, taking into account the environmental effects. The consideration of alternatives typically refers to alternative design, technology, location, size and scale. A 'Do-Nothing Alternative' i.e., an outline of what is likely to happen to the environment should the Proposed Project not be implemented, has also been considered.

Alternative Locations

The process of identifying a suitable wind farm site is influenced by a number of factors. While wind speeds, the area of suitable or available land, proximity to a grid connection point and planning policy are all very important, a wind farm project must be commercially viable/competitive, otherwise it will be difficult to attract the necessary investment required for its development.

Sites selected for the development of a wind farm must be suitable for consideration under a number of criteria, such as:

- **Planning Policy:** Compliance with County Development Plan Renewable Energy Strategy for wind energy development;
- **Environmental Sensitivities:** Located outside of EU Natura 2000 sites; locations outside of National designations; located outside of Article 17 Annex I Habitats;
- **Grid Connection:** Proximity to the national grid node;
- **Wind Speed:** Average annual wind speeds conducive to wind energy development;
- **Sensitive Properties:** Capable of complying with required setbacks from sensitive properties.
- **Site Scale:** Sufficient area of unconstrained land that could potentially accommodate a wind farm development and turbine spacing requirements.

From the review of the criteria set out above, the Site was identified as a suitable location for the provision of a renewable energy development of the scale proposed. The Site predominantly comprises pastoral agricultural land and with small scale private forestry and local roads. It is accessible via farm entrances off the N62, L-3248, the L-7039 and the L-70391 and has existing farm tracks within. As such, the Proposed Project design can make sustainable use of these established items of infrastructure. The Site has been identified by the Tipperary Renewable Energy Strategy 2016 as an area "Open to Consideration for New Wind Energy Developments". The Site does not overlap with any environmental designations, is located in an area with a relatively low population density and has appropriate annual wind speeds.

Alternative Renewable Energy Technologies

To achieve the same electricity output from solar energy as is expected from the Proposed Wind Farm (c. 63MW), a larger development footprint would be required. The Site encompasses an area of approximately 650 hectares and the permanent footprint of the Proposed Project measures approximately 8.47 hectares, which represents approximately 1.3% of the Site. In order to achieve a c. 63MW output

using solar PV arrays, there would be a requirement of approximately 100 ha, which represents approximately 15% of the Site.

Although the screening exercise was based on identifying lands for onshore wind development; another alternative source of renewable electricity generation would be offshore wind energy.

Enerco Energy Ltd has a keen interest in offshore wind farms and has explored potential offshore sites. However, it is considered that due to delays with the regulatory process for offshore development, a combination of both onshore and offshore wind farm development will continue to be required to deliver on the ambitious renewable energy targets set under the Climate Action Plan 2023 which include focusing on onshore wind energy developments to reach the 2025/2030 renewable energy targets. As such, Enerco's primary focus remains to be onshore wind farms and they will continue to explore potential development offshore in tandem with delivering suitable sites onshore such as this Site.

The Applicant Buirios is a subsidiary of Enerco Ltd, an Irish owned developer with extensive experience in the design, construction and operation of onshore wind energy developments throughout Ireland. The Applicant is committed to playing a key role in helping the State achieve its CAP objectives while building upon its proven record of generating clean renewable energy to the national grid. As such, the option of an offshore project is not considered to be a reasonable alternative at this time.

Alternative Turbine Numbers and Model

The proposed wind turbines will have a potential power output of 7-megawatt (MW) range. It is proposed to install 9 turbines at the Site which could achieve approximately 63 MW. Such a wind farm could also be achieved on the proposed Site by using smaller turbines (for example 3.8 MW machines). However, this would necessitate the installation of over 16 turbines to achieve a similar output. Furthermore, the use of smaller turbines would not make efficient use of the wind resource available having regard to the nature of the Site. A larger number of smaller turbines would result in the wind farm occupying a greater footprint within the Site, with a larger amount of supporting infrastructure being required (i.e., roads, hardstands etc) and increasing the potential for negative environmental impacts to occur.

Alternative Turbine Layout and Development Design

The design of the Proposed Wind Farm has been an informed and collaborative process from the outset, involving the design team. The aim being to reduce potential for environmental effects while designing a project capable of being constructed and viable.

Following the mapping of all known constraints, detailed site investigations were carried out by the project team. The ecological assessment of the Site encompassed habitat mapping and extensive surveying of birds and other fauna. This assessment, as described in Chapter 6 of this EIAR on Biodiversity, optimised the decision on the siting of turbines and the carrying out of any development works, such as the construction of roads. The hydrological assessment of the Site encompassed site specific flood modelling for 100-yr and 1000-yr events. This assessment, as described in Chapter 9 of this EIAR on Hydrology and Hydrogeology, also optimised the decision on the siting of turbines, roads and the onsite substation. Where specific areas were deemed as being unsuitable for the siting of specific infrastructure, alternative locations were proposed and assessed. The final proposed layout takes account of the results of all onsite investigations and baseline assessments that have been carried out during the EIAR process. The final chosen layout is considered the optimal layout given it has the least potential for environmental effects.

Alternative Grid Connection Underground Electrical Cabling Route Options

The 63MW output of the Proposed Wind Farm is such that it needs to connect to the grid at 110kV. The nearest 110kV infrastructure is the 110kV Ikerrin to Thurles overhead line approx. 1.4km southeast of

the proposed onsite substation, the Ikerrin substation 8.6km to the north and the Thurles substation 14km to the south. To connect to the Ikerrin or Thurles substations a considerable underground cable route through national and local roads would be required or a considerable overhead line to either substation would be required. However, a connection to the 110kV overhead line would require a significantly shorter grid connection cable route. The presence of local roads in the area and the ability to gain agreements with some landowners resulted in a relatively short underground grid connection cabling route through a mix of local road (just 870m) and new track across agricultural land (approx. 1.2km). The Proposed Grid Connection design does not fall within any environmental designations and is underground to minimise visual impact as recommended in the *Wind Energy Development Guidelines for Planning Authorities* (Department of the Environment, Heritage and Local Government 2006), hereafter the 2006 WEDGs, and the *Draft Revised Wind Energy Development Guidelines* (Department of Housing, Planning and Local Government 2019), hereafter 2019 draft WEDGs, and the Tipperary Renewable Energy Strategy 2022-2028 in order to minimise visual impacts. The final Proposed Grid Connection design also takes account of the findings from all site constraints (e.g., ecology, archaeology, hydrology, peat depths etc.), site investigations and baseline assessments, and design constraints (e.g., third party lands) that have been carried out during the EIAR process.

Alternative Port of Entry and Site Access

The ports considered for the port of entry of wind turbines into Ireland for the Proposed Project include Port of Galway Shannon-Foynes Port, County Limerick and Dublin Port. Shannon Foynes Port is the principal deepwater facility on the Shannon Estuary and caters for dry bulk, break bulk, liquid and project cargoes. Port of Galway and Dublin Ports also offer a roll-on roll-off procedure to facilitate import of wind turbines. All three ports and indeed others in the State, offer potential for the importing of turbine components. However, for the purpose of this EIAR, the port of entry selected for the Proposed Project is Dublin Port.

The Site is located approx. 9.4km south of the M7/N62 junction and the N62 runs north-south along its western boundary, as such, turbine components have a relatively direct route from Dublin Port to Site via motorways and a national road without the need for regional or smaller local roads. Therefore, the Dublin Port–N7/M7–N62 route was put forward for further investigation at the commencement of the Site selection process. After review by the Traffic Consultant and subsequent autotrack assessment, it was concluded that this route will require minimal accommodating works, avoids towns, villages and third party landtake to facilitate the delivery of abnormal loads to the Site. Furthermore, it has a low potential for traffic disruption and prolonged noise or emissions. Therefore, the optimal delivery route is one that utilises the M7 and N62 and consequently, alternative component delivery routes from the motorway to the site were not investigated further.

Abnormal Load Entrances

Following discussion with Tipperary County Council (TCC), it was concluded that a separate entrance for abnormal loads would be constructed at the Site with all other Heavy Goods Vehicles (HGVs) and construction phase vehicles using a separate entrance. The abnormal load entrance will be temporary in nature and will be reinstated following completion of abnormal load deliveries. This is to ensure no impacts occur on traffic flow on the adjacent N62. Given the Site's proximity to the M7 and the N62 adjacent to the west, the most logical access point for abnormal loads was considered to be the along the western boundary of the Site. An autotrack assessment confirmed the suitability of the northwestern boundary for abnormal load entry with minimal landtake requirements and minimal environmental impacts. An alternative to this was to take the abnormal loads up the L-3428 into existing farm entrances located approximately 50m and 700m from the N62, or via a new general construction access point. However, due to the necessary land take requirements, inadequate sightlines and the potential for noise, dust and traffic impacts on Sensitive Properties, this option was ruled out. Another alternative was to insert a new abnormal load entrance on the N62; however, direct access off the N62 was discouraged in discussions with TCC.

General Construction and Operational Entrances

There are a number of existing access points to the Site. These comprise private farm access points off the N62, the L-3248, the L-7039 and the L-70391. An initial review of these existing locations was carried out to identify the most suitable locations for wind farm construction and operation site entrances.

The existing entrances off the L-3248 approximately 50m from the N62 was deemed unsuitable due to the lack of adequate sightlines.

The existing farm entrance on the L-3248 approximately 700m from the N62 was ruled out due to the requirement to bring traffic past several residential properties giving rise to potential dust, noise and traffic impacts.

Therefore a new site entrance off the L-3248 approximately 70m from the N62 which has achieved the necessary sightlines is proposed for both general construction and operation, adjacent to an existing farm entrance.

The existing L-70391 within the Site facilitates secondary operational access to the Proposed Wind Farm and construction and operational access for the proposed on-site 110kV substation. This Local Road and its junction with the L-7039 will require upgrading, to facilitate the Proposed Project. An alternative to using the existing Local Road would be to build an entirely new access road which was not considered further.

Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the Proposed Project's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas of the site limits the potential for environmental effects. As noted above, the site layout aims to avoid any environmentally sensitive areas. Where loss of habitat occurs in the Site, this has been mitigated with habitat replacement and enhancement proposals.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options is sustainable.

1.4

Description of the Proposed Project

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Project (Wind Farm and Grid Connection) and its component parts which are the subject of separate planning applications under Section 37E (Proposed Wind Farm) and Section 182A (Proposed Grid Connection) of the Planning and Development Act 2000, as amended. The current application for planning permission to An Bord Pleanála in accordance with Section 37E of the Planning and Development Act 2000, (as amended) is for the Proposed Wind Farm. The development description for the current planning application as appears in the public notices is as follows:

The proposed development will consist of the provision of the following:

- i. 9 no. wind turbines with an overall turbine tip height of 185 metres; a rotor blade diameter of 163 metres; and hub height of 103.5 metres, and associated foundations and hard-standing areas;*
- ii. A thirty-year operational life of the wind farm from the date of full commissioning of the wind farm and subsequent decommissioning;*

- iii. Underground electrical cabling (33kV) and communications cabling;*
- iv. A temporary construction compound;*
- v. A temporary security cabin;*
- vi. A meteorological mast with a height of 30 metres and associated foundation and hard-standing area;*
- vii. A new gated site entrance on the L3248;*
- viii. Junction accommodation works and a new temporary access road off the L3248, to facilitate turbine delivery to the site;*
- ix. Upgrade of existing site tracks/ roads and provision of new site access roads, junctions and hardstand areas.*
- x. Upgrade of the existing L7039/ L70391 junction for secondary site access off the L70391;*
- xi. A borrow pit;*
- xii. Spoil Management;*
- xiii. Tree felling;*
- xiv. Site Drainage;*
- xv. Biodiversity Enhancement Plan (including restoration of a segment of the Eastwood River, and planting of natural woodland and hedgerow);*
- xvi. Operational Stage site signage; and*
- xvii. All ancillary works and apparatus.*

The application is seeking a ten-year planning permission.

The Proposed Grid Connection, which will be subject to a separate planning application under Section 182A of the Planning and Development Act, 2000 (as amended) is entirely located within the townlands of Strogue and Clonmore, Co. Tipperary, and will consist of the following:

- 1. 1 no. permanent 110kV substation compound (2 no. control buildings with welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, wastewater holding tank, site drainage and all ancillary works);*
- 2. a temporary construction compound;*
- 3. 2km underground 110kV electrical cabling route (including joint bays and watercourse crossings) which will run through the L-7039 road and third-party agricultural land; and*
- 4. 2 no. new end masts that will break the existing Ikerrin to Thurles 110kV OHL.*

The Proposed Wind Farm design is shown in Figure 4-1. The Proposed Grid Connection layout is shown in Figure 4-2. The overall layout of the Proposed Project (Proposed Wind Farm and Proposed Grid Connection combined) is shown on Figure 4-3. Detailed drawings of the Proposed Wind Farm are included in Appendix 4-1 of this EIAR. Refer to Appendix 4-5 for detailed drawings of the Proposed Grid Connection. All elements of the Proposed Project, i.e. the Wind Farm and Grid Connection, have been assessed as part of this EIAR.

The proposed wind turbine layout has been optimised using wind farm design software (a combination of WAsP and WindPro) to maximise the energy yield from the Site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 1 below.

Table 1 Proposed Wind Turbine Locations and top of foundation level

Turbine	ITM X	ITM Y	Top of Foundation Levels (metre OD)
1	613427	676731	112
2	613113	676241	110
3	613277	675630	110.6
4	613112	675119	109.3
5	613207	674658	109
6	613447	674244	110
7	612619	673934	108.7
8	613447	674244	108.7
9	613009	673653	108.7

The turbine model to be installed on the Site will have an overall turbine tip height of 185 metres, a blade rotor diameter of 163 metres and hub height of 103.5 metres. Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. For the purposes of this EIAR, a rated output 7 MW has been chosen to calculate the power output of the proposed 9-turbine renewable energy development, which would result in an estimated installed capacity of 63 MW.

The Proposed Wind Farm makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 930m of existing site roads and tracks and approximately 1.1km of the L70391 which is within the Site, and to construct approximately 6 kilometres of new access roads. A temporary construction compound measuring approximately 4,950 square metres in area will be located in the northern section of the Site, approximately 520m from the construction phase entrance.

One metrological (met) mast is proposed as part of the Proposed Wind Farm. The met mast will be equipped with wind monitoring equipment at various heights.

Each turbine will be connected to the on-site electricity substation via underground 33 kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the met mast to the onsite substation. The electricity and fibre-optic cabling connecting to the onsite substation compound will be run in cable ducts approximately 1.2 metres beneath ground level, along the sides of roadways and/or under the roadways.

It is proposed to manage any excess overburden generated through construction activities locally within the Site, in identified spoil management areas, and in linear berms along access roads where appropriate.

As part of the Proposed Wind Farm, it is intended to restore the pattern, profile and dimensions of a 266 segment of the Eastwood River. Surrounding the Eastwood River, it is proposed to plant approx. 1.8ha of the forestry in the form of natural woodland. In addition to this, it is proposed to plant 5.17km of linear vegetation across the Site. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan for details.

The forestry felling activities required as part of the Proposed Wind Farm will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. Further details on tree felling required is detailed in Chapter 4 and Chapter 6 of this EIAR.

A temporary entrance will be constructed off the L-3248, adjacent to the N62 in the northwest of the Site. This entrance will facilitate the delivery of the turbine components and will be manned for the duration of the abnormal load deliveries. This temporary access track measures approx. 1,350m² and was subject to autotrack assessment to identify the turning area required, as described in Chapter 15, Section 15.1 of the Traffic and Transport Assessment.

The main construction entrance will be constructed off the L-3248, approximately 70m northeast of the N62. This entrance will be used as the main entrance for construction traffic and staff vehicles. Appropriate sightlines will be established to the north and south of the proposed Site entrance for the safe egress of traffic during the operational phase. An existing farm entrance adjacent to this new entrance will be closed permanently. This new main construction entrance on the L-3248 will continue to provide operational phase access to the Proposed Project and permanent agricultural use access in lieu of the existing field gate being closed permanently. On completion of the construction phase, the Site entrance will be reduced in size and gated for security.

Secondary site access will be established to the southeast of the site with the upgrade of the L-70391 Local Road which is within the Site and upgrade of the junction between the L- L-70391 and the 7039. This entrance was subject to autotrack assessment to identify the turning area required, as described in Section 15.1 of the Traffic and Transport Assessment. Appropriate sightlines will be established to the north and south of this entrance for the safe egress of traffic. The proposed works will result in the widening of 460m of the L-70391 road and resurfacing of the of the entire L-70391 (approx. 1.1km total length). This secondary Site entrance will also facilitate the construction of the Proposed Grid Connection, with the proposed on-site substation located immediately adjacent to the L70391 and will provide operational access for maintenance of the Proposed Project and existing public access to lands involved in the Proposed Project.

In order to facilitate the construction of the Proposed Project, the majority of rock and hardcore material that will be required during the construction of the Proposed Wind Farm will be sourced from an on-site borrow pit with the remaining rock and hardcore material sourced from local, appropriately authorised quarries.

As discussed, an application for the Proposed Grid Connection will be submitted separately to ABP in accordance with Section 182A of the Planning and Development Act 2000, as amended. It is proposed to construct an onsite 110 kV substation within the Site and to connect from here via a 110 kV underground electrical cable connection to the existing 110 kV Ikerrin to Thurles OHL. The underground electrical cabling route originates at the proposed onsite 110kV substation within the Site before reaching the 110kV Ikerrin to Thurles OHL. The underground electrical cabling route is approximately 2km in length and is located within a mix of local road (870m) and new track across agricultural land (1.2km).

The proposed onsite 110kV substation measures approximately 11,605m² and is located at the southeast of the Site, in the townland of Clonmore. The construction and exact layout of electrical equipment in the on-site electricity substation will be to Eirgrid/ ESB Networks specifications. Access to the substation will be off the Local Road L-70391 immediately adjacent to its southern boundary and also through internal wind farm roads which are accessed off the L-3248 in the northwest of the Site. Upon decommissioning of the Proposed Wind Farm, the 110kV substation within Clonmore townland will most likely remain *in situ* and form part of the national grid infrastructure.

The 110kV substation will require its own separate temporary construction compound. This temporary construction compound will measure approximately 2,539m² in area will be located adjacent to the

substation. The underground cabling connection measures approx. c.2km in length and will run through a mix of local road (L7039) and new access track across agricultural land. The existing OHL will be broken with 2 no. new end masts (lattice-type towers) to facilitate the connection to the proposed onsite substation via the underground electricity cabling. The underground cabling route includes two parallel cable trenches, and once constructed, electricity on the Ikerrin-Thurles 110kV OHL will be transmitted through the proposed substation, hence the 'loop-in/loop-out' nature of the proposed substation.

It is estimated that the construction phase of the Proposed Project will take approximately 18-24 months from commencement of civil works to the commissioning of the wind turbines. The construction phase can be broken down into three main phases, which overlap partially and will take approximately 18-24 months to complete 1) civil engineering works - 10 months, 2) electrical works including grid connection works - 9-12 months, and 3) turbine erection and commissioning - 8 months.

The Proposed Wind Farm is expected to have a lifespan of approximately 30 years. As part of this planning application, permission is being sought for a 30-year operation period commencing from the date of full operational commissioning of the Proposed Project. During the operational period, on a day-to-day basis the wind turbines will operate automatically, responding by means of meteorological equipment and control systems to changes in wind speed and direction.

The wind turbines proposed as part of the Proposed Wind Farm are expected to have a lifespan of approximately 30-35 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Wind Farm will be decommissioned fully. The Grid Connection infrastructure will remain in place as it will be under the ownership and control of the ESB and EirGrid.

1.5

Population and Human Health

One of the principal concerns in the development process is that individuals or communities, should experience no significant diminution in their quality of life from the direct, indirect or cumulative effects arising from the construction, operation and decommissioning of a development. Ultimately, the impacts of a development have the potential to impinge on human health, directly and indirectly, positively and negatively. The key issues examined in this chapter of the EIAR include population, human health, encompassing employment and economic activity, land-use, residential amenity (noise, visuals, setbacks), community facilities and services, tourism, property values, shadow flicker and health and safety.

The Site is located approximately 11km south of Roscrea Town and approximately 2.5km northeast of Templemore town centre. The Site is served by a number of existing agricultural roads and tracks.

Current land-use at the Site comprises agricultural, small-scale forestry and local road use. Land-use in the wider landscape of the Site comprises a mix of agriculture, residential and commercial and road use.

Up to 100 jobs could be created during the construction, operation and maintenance phases of the Proposed Project with most construction workers and materials sourced locally, thereby helping to sustain employment in the construction trade. This will have a Short-Term Significant Positive Impact.

There is currently no published credible scientific evidence to positively link wind turbines with adverse health effects. The main publications supporting the view that there is no evidence of any direct link between wind turbines and health are summarised in Chapter 5 of this EIAR. Although there have been no empirical studies carried out in Ireland on the effects of wind farms on property prices, it is a reasonable assumption based on the available international literature that the provision of a wind farm at the proposed location would not impact on the property values in the area.

Shadow flicker is an effect that occurs when rotating wind turbine blades cast shadows over a window in a nearby property. Shadow flicker may be experienced by an occupant sitting in an enclosed room when sunlight reaching the window is momentarily interrupted by a shadow of a wind turbine's blade. Shadow flicker effect lasts only for a short period of time and happens only in certain specific combined circumstances. The 2006 WEDGs recommend that shadow flicker at neighbouring dwellings within 500 metres of a proposed turbine location should not exceed a total of 30 hours per year or 30 minutes per day. It is further noted that at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low, and therefore the shadow flicker study area is set at 1.63km (10 x rotor diameter of 163m). There are 140 no. Sensitive Properties located within the 1.63km Shadow Flicker Study Area of the proposed turbines.

The potential shadow flicker occurring at houses located within the Shadow Flicker Study Area was calculated using the ReSoft WindFarm Version 5.0.2.2 software package and a regional sun factor of 26.46% was applied. Of the 140 No. properties modelled; it is predicted that 86 Sensitive Properties may experience shadow flicker that exceeds the 2006 WEDGs thresholds of 30 minutes per day or 30 hours per year. However, this prediction does not consider wind direction or screening provided by intervening vegetation and topography.

Where shadow flicker exceedances are experienced, suitable mitigation measures as outlined in Chapter 5 will be employed at the potentially affected properties to ensure that the limits set out in the 2006 WEDGs are not exceeded at any dwelling within the Shadow Flicker Study Area. It is also noted that the Proposed Project can be brought in line with the requirements of the 2019 draft WEDGs should they be adopted while this application is in the planning system, through an alteration of the implementation of the mitigation measures outlined.

Impacts on human beings during the construction, operational and decommissioning phases of the Proposed Project are described in Chapter 5 in terms of health and safety, employment and investment, population, land-use, noise, dust, traffic, tourism, residential amenity, renewable energy production and reduction in greenhouse gas emissions, shadow flicker and interference with communication systems. Where a negative impact is identified, appropriate mitigation measures will be put in place to ensure that there will be no significant health effects on Sensitive Properties in the surrounding area.

Biodiversity

This section of the EIAR assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Project may have on Biodiversity, and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

To inform the assessment, a comprehensive desk study and suite of field surveys has been carried out. Multidisciplinary walkover surveys were undertaken on the 11th of August 2022, 25th August 2022, 18th October 2022, 13th April 2023, 27th April 2023, 11th May 2023 and the 21st September 2023.

All surveys were carried out in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009).

The habitat surveys of the Site covered the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011). Dedicated species/habitat specific surveys (including bats and protected mammals) and detailed habitat assessment surveys were carried out during which any incidental records of other species were also recorded. Additionally, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted. Depending on the findings of the multidisciplinary surveys, further detailed targeted surveys were carried out for features and locations of ecological significance. In addition, baseline aquatic habitat, fisheries and macroinvertebrate surveys have been undertaken as part of the detailed baseline assessment, the detailed results of which are provided in technical appendices to this EIAR.,

The surveyed habitats were the subject of a detailed assessment and mapping exercise. The assessment and habitat mapping were undertaken following the 'A Guide to Habitats in Ireland' (Fossitt, 2000). Grassland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification.

The Site comprises large areas of improved agricultural grassland (Fossitt code GA1). The areas of improved agricultural grassland have primarily been intensively managed for livestock grazing, and almost all fields surveyed have been reseeded with perennial ryegrass. A network of hedgerows (WL1), Treelines (WL2) and Drainage Ditches (FW4) occur throughout the Site and delineate the field boundaries. Other less expansive habitats also within the Site include Wet Grassland (GS4), Conifer Plantation (WD4), and (Mixed) Broadleaved Woodland (WD1). A number of Depositing/ Lowland Rivers (FW2) flow through the Site including the Shanakill River, Farranacahill River, Eastwood River, Clonmore River and its tributaries and the River Suir.

The majority of the lands on either side of the road along the length of the Proposed Grid Connection underground electrical cabling route is made up of improved agricultural grassland, with associated hedgerow (WL1) and Treelines (WL2). Depositing/ lowland rivers (FW2) and drainage ditches (FW4) also cross the underground electrical cabling route at a number of locations.

The construction of the Proposed Project will result in the loss of areas of habitat that are of Local Importance (Lower Value) including the loss of coniferous plantation forestry (WD4), wet grassland (GS4) and improved agricultural grassland (GA1) which have been assessed as of low ecological value and no specific mitigation is required for the loss of these habitats.

Approximately 1.8km of hedgerow/scrub will be permanently removed within and around the footprint of the Proposed Project to facilitate some elements of infrastructure and new access roads. Removal of this combined length hedgerow/treeline is also required to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021). It is proposed to plant 5.17km of new hedgerow to offset this potential loss and to provide additional habitat connectivity within the Site. Overall, the proposed replanting will result in a net gain of approximately 3.37km in the linear landscape features within the Site.

Approximately 0.78ha of (mixed) broadleaved woodland in the form of thin strips of linear woodland and ash plantation will be removed to facilitate Proposed Project infrastructure and the required bat buffer distance as outlined above. It is proposed to plant 1.8ha of native tree species to offset this potential loss, to provide additional habitat within the Site and in association with a proposed river restoration plan (outlined below).

While there will be no loss of any natural watercourse within the Site it is proposed, as a biodiversity enhancement measure, to restore a 240m segment portion of the Eastwood River within the Site which is currently in poor condition. The proposal will create a new channel approximately 300m in length. Riffles will be constructed within the channel to provide improved habitat diversity. Bioengineering techniques such as livestaking and use of brush mattresses will be used to promote bank stability on the outside of meander bends. The river restoration measures will result in the creation of increased microhabitat diversity. The proposed replanting of 1.8ha of native tree species outlined above will occur on both sides of the newly restored river section and will aid in the creation of a diverse habitat mosaic for aquatic and terrestrial biodiversity.

Bat species composition and abundance was found during detailed bat surveys undertaken at the Proposed Project site to be typical of the geographic location and nature of the Site, and the Site is utilised by a regularly occurring bat population of Local Importance. Following the implementation of mitigation no potential for residual significant effects with regard to loss of commuting and foraging habitat, loss or damage to roosts, displacement or other construction phase impacts have been identified; the proposed net gain in linear landscape features within the site will result in a long-term positive impact on bats at the local level. In relation to potential collision risk and injury with operational turbines, an adaptive monitoring and mitigation strategy has been devised for the Proposed Project in line with NatureScot (2021) Guidance, which will ensure that there is no potential for significant residual effects on local bat populations during the operational phase of the Proposed Project.

Watercourses within the Site provide suitable habitat for otter, and evidence of the species was recorded in the form of spraint and feeding remains at a number of locations on the Shanakill River and the River Suir. In addition, an Otter was sighted on the 21/09/2022, in the Eastwood River, southeast of Turbine 6/northeast of Turbine 7. No otter holts or other resting places were recorded during any of the ecological surveys. There is no potential for direct loss or fragmentation of significant otter habitat including loss of breeding or resting places. Given that no otter holts or resting places were recorded within the Site, no direct mortality, significant disturbance or any barrier to the movement of otter is anticipated. From a precautionary perspective, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Project footprint, consultation will be undertaken with the National Parks and Wildlife Service and any additional mitigation required would be implemented, under a derogation licence where required.

A number of both active and inactive badger setts were found within the Site, as well as evidence of usage of an unoccupied badger sett by a pine marten. The Proposed Project has been sited to avoid direct damage or disturbance to these features. Additional measures including a pre-construction survey and additional monitoring where necessary to identify all active setts within proximity of the Proposed Project at the time of construction will allow for any additional mitigation required to be implemented to ensure that no undue disturbance to badgers or pine marten takes place during the construction phase.

No significant effects on surface water quality, groundwater quality or the hydrological/ hydrogeological regime are identified during construction, operation, or decommissioning. A full hydrological assessment in relation to the Proposed Project has been carried out in Chapter 9 of the EIAR.

On a precautionary basis, one nationally designated site (Cabragh Wetlands proposed Natural Heritage Area (pNHA)) has been identified as being within the zone of impact. No potential for residual adverse impacts on this pNHA have been identified following implementation of mitigation measures in relation to potential effects on rivers/streams and sensitive aquatic faunal species and therefore no significant effects on this pNHA are anticipated.

An Appropriate Assessment Screening Report and Natura Impact Statement (NIS) accompanies this Planning Application. These reports have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening and an Appropriate Assessment for the Proposed Project in compliance with Article 6(3) of the Habitats Directive. The Appropriate Assessment Screening Report identified the potential for significant effect on one European Site (Lower River Suir SAC 002137). The NIS concludes that the Proposed Project, individually or in-combination with other plans or projects, will not adversely affect the integrity of any European Site.

It is therefore judged that, provided that the Proposed Project is constructed and operated in accordance with the design and best practice mitigation and monitoring measures that are described within this application, significant residual impacts on biodiversity, flora and fauna will not occur. The Biodiversity Enhancement Measures (Appendix 6-4) outlined for the Proposed Project will result in a slight long term increase in biodiversity value within the Site.

Ornithology

This chapter assesses the likely significant effects that the Proposed Project may have on bird species. Firstly, a brief description of the Proposed Project is provided, along with the relevant legislation, guidance and policy context. This is followed by a comprehensive description of the survey and impact assessment methodologies that were followed in order to obtain the information necessary to complete a thorough assessment of the potential effects of the Proposed Project on bird species. The survey data is presented in full in the Environmental Impact Assessment Report (EIAR) Appendices 7-1 to 7-5, with a summary of the information presented within this chapter. An analysis of the results is then provided, which discusses the ecological significance of the birds recorded within the Site. The potential effects of the Proposed Project are then described in terms of the construction, operation and decommissioning phases. An accurate prediction of the effects is derived following a thorough understanding of the nature of the Proposed Project along with a comprehensive knowledge of bird activity within the Site and surrounds. The identification of Key Ornithological Receptors (KORs) and the assessment of effects follow a precautionary approach.

The potential for effects on designated sites is fully described in the Natura Impact Statement (NIS) that accompanies this application. The NIS concluded that where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation and decommissioning of the Proposed Project will not adversely affect the integrity of any European Sites.

Based on the detailed assessment, it is considered that the potential effects of the Proposed Project upon birds will not be significant. Effects associated with habitat loss, disturbance/displacement, collision risk and cumulative effects have been assessed to be no greater than a 'low' effect significance (Percival, 2003) or 'slight' effect significance (EPA, 2022). An exception was lapwing and golden plover, for which a 'medium' effect significance (Percival, 2003) or 'moderate' effect significance (EPA, 2022) were predicted. However, as detailed in Chapter 7 Section 7.6 and Appendix 7-7 of this EIAR, a robust mitigation plan is proposed to reduce the magnitude of the identified impact to 'low' (Percival, 2003) or 'slight' (EPA, 2022). The implementation of the prescribed mitigation measures will render any potential effects on KORs to a 'low' (Percival, 2003) or 'slight' (EPA, 2022) effect significance. In conclusion, no significant effects as a result of the Proposed Project are foreseen on the avian community of the Site.

Land, Soils and Geology

The geology of the Site has been characterised using desk study information and site investigations. Several walkover inspections of the Site have been conducted as well as trial pits, boreholes and soil probing. The subsoils at the Site comprise glacial tills and alluvial deposits. There is also shallow peat/peaty topsoil present at some locations.

The alluvial deposits are associated with the River Suir which flows through the Site. The confirmed depth of overburden at the Site ranges from 0.2m to 8.8m and is deepest where alluvial deposits are present. The underlying bedrock was confirmed as limestone.

Excavation of soils, subsoils and bedrock will be required for construction. Rock for construction will be sourced from a temporary on-site borrow pit as well as local quarries as required. Spoil arising from construction works will be accommodated in the borrow pit re-instatement as well as dedicated Spoil Management Areas at the Site. Turbine base construction will either be gravity base foundation or piled as informed by more detailed site investigations. Arisings from the public road section of the grid connection underground cabling route will be sent to a licensed waste facility, as appropriate.

The handling of hydrocarbons/chemicals and cement-based compounds will be managed using best practice methods. Measures to prevent soil and subsoil erosion during excavation and reinstatement will be undertaken to prevent potential water quality impacts. All proposed Spoil Management Areas as well as the borrow pit are located outside of fluvial flood zones to avoid being affected by flood waters.

An assessment of the construction stage, operational stage and decommissioning stage has been completed, along with a cumulative assessment for each stage of the Proposed Project. Based on the above, and with implementation of the outlined mitigation measures, no significant effects on the land, soils and geology environment will occur.

1.9

Hydrology and Hydrogeology

The Site is located in the upper reaches of the River Suir catchment. Locally the Site is mapped within 3 no. WFD river sub-basins, the Suir_020 sub-basin, Eastwood_010 sub-basin (Eastwood River) and Clonmore Stream (Suir)_010 river sub basin.

The majority of the Site lies within the Suir_020 sub-basin in the north, east and south, whilst the western portion of the Site is situated in the Eastwood_010 sub-basin. The Proposed Grid Connection underground cabling route runs easterly within the southeast of the Site and into the Clonmore Stream (Suir)_010 river sub basin.

The Site is extensively drained by a network of natural watercourse (streams & rivers) and manmade land drain networks. All watercourses and manmade drains at the Site drain into the River Suir which flows southerly through the eastern side of the Site.

Due to the nature of the Proposed Project being near surface construction activities, impacts on groundwater are imperceptible and river waterbodies are the main sensitive receptors assessed during impact assessments. The primary risk to groundwater at the site would be from oil spillage and leakages at turbine foundations or during construction plant refueling. These are common potential impacts to all construction sites (such as road works and industrial sites). These potential contamination sources are to be carefully managed at the site during the construction, operational and decommissioning phases of the Proposed Project and measures are proposed within the EIAR to deal with these potential minor local impacts.

The Site is not located within any designated conservation site. The nearest designated site is the Templemore Wood pNHA (Site Code: 000942) which is located directly north of Templemore town, approximately 2km southwest of the Site. The Lower River Suir SAC (Site Code: 002137) is located ~22km downstream of the Site along the Suir River. Further downstream the River Suir discharges into the River Barrow and River Nore SAC (Site Code: 002162) >100km downstream of the Site. Following implementation of the appropriate mitigation measures as outlined in the EIAR there will be no impact on these designations from a hydrological perspective.

Two methods will be employed to control surface water quality and aquatic habitats. The first method involves 'keeping clean water clean' by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waters from works areas within the Site that might carry silt, to allow settlement and cleaning prior to its release. During the construction phase, all runoff will be treated to a high quality prior to being released. Effects on surface water quality during the construction phase of the Proposed Project will be imperceptible to none. A surface water monitoring programme will be put in place during the construction phase.

During each phase of the Proposed Project (construction, operation and decommissioning) a number of construction related activities will take place on the Site which will have the potential to affect the hydrological regime or water quality at the Site or its vicinity. These potential effects arise from sediment

input from runoff and other pollutants such as hydrocarbons and cement-based compounds, with the former having the most potential for impact. These potential effects are similar to any construction site.

Based on a site-specific flood risk assessment and flood modelling carried out for the Proposed Project, proposed turbine locations T3, T4, T7, T8 and T9 are potentially located in fluvial flood zones. Proposed measures to reduce flood risk with regard these turbines, include having finished floor levels +500mm above the 1000-year flood level. Also proposed new roads in flood zones will be kept close to existing ground level to avoid alteration of surface water flows and reduce potential road damage during flood events. The flood modelling shows that these proposed flood resilience measures will have no potential to increase flood risk elsewhere.

All proposed Spoil Management Areas as well as the borrow pit are located outside of the modelled fluvial flood zones to avoid potential surface water quality effects during floods.

The proposed Biodiversity Enhancement Plan includes the restoration of a portion of the Eastwood River within the Site. This river channel was previously deepened and straightened, it is proposed to restore a natural pattern and profile and the establishment of a native woodlands buffer on both sides of the meandered channel. The proposed river restoration will have a positive effect on local hydrology and ecology.

An assessment of the Proposed Project construction, operational and decommissioning stages has been completed, along with a cumulative assessment for each stage. Based on the above, and with implementation of the outlined mitigation measures, no significant effects on the surface water and groundwater environments/WFD status will occur.

1.10

Air Quality

This chapter identifies, describes and assesses the potential significant direct and indirect effects on air-quality arising from the construction, operation and decommissioning of the Proposed Project.

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and environs
- Zone B: Cork City and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Clean Air for Europe (CAFE) Directive (as amended) and the Fourth Daughter Directive.

The air quality zone for the Site was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO₂), Particulate Matter (PM₁₀), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO) and Ozone (O₃) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Project. The Site lies within Zone D, which represents rural areas located away from large population centres.

The air quality in the vicinity of the Proposed Project is typical of that of rural areas of Ireland, i.e., Zone D. Prevailing south-westerly winds carry clean, unpolluted air from the Atlantic Ocean onto the Irish mainland. The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in Ireland 2022' was published by the EPA in 2023. The EPA reports provide SO₂, PM₁₀, NO₂ and O₃ concentrations for areas in Zone D. These are detailed in section 10.1.5 of Chapter 10 Air Quality.

Due to the non-industrial nature of the Proposed Project and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR.

The production of energy from wind turbines has no direct emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment. Some minor short term or temporary indirect emissions associated with the construction of the Proposed Project include vehicular and dust emissions.

A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3 of the ELAR) and includes dust suppression measures. In addition, turbines and construction materials will be transported to the site on specified transport routes only. The agreed transport route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Proposed Project will result in emission savings of carbon dioxide (CO₂), oxides of nitrogen (NO_x), and sulphur dioxide (SO₂). The production of renewable energy from the Proposed Project will have a long-term significant positive impact on air quality due to the offsetting of approximately 58,808 tonnes of Carbon Dioxide (CO₂) per annum.

1.11

Climate

This chapter identifies, describes and assesses the potential significant direct and indirect effects on climate arising from the construction, operation and decommissioning of the Proposed Project.

The production of energy from wind turbines has no direct emissions as is expected from fossil fuel-based power stations. Harnessing more energy by means of wind farms will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment.

Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of greenhouse gases in the atmosphere. These greenhouse gases come primarily from the combustion of fossil fuels in energy use. Changing climate patterns are linked to increased frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

In June 2023, the Environment Protection Agency released ‘Ireland’s Greenhouse Gas Emissions Projections 2022-2040’. The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a “With Existing Measures” (WEM) scenario and a “With Additional Measures” (WAM) scenario. These scenarios forecast Ireland’s greenhouse gas emissions in different ways. The WEM scenario forecasts Ireland emissions including all national policies and measures implemented by the end of 2021, the latest inventory year. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions, such as those in Ireland’s Climate Action Plan 2023 (CAP 23), that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario.

The projections show that implemented policies and measures in the WEM scenario can deliver an 11% reduction in greenhouse gas emissions by 2030 compared to the 2018 level. The WAM scenario, including policies and measures from CAP23, is projected to deliver a 29% emissions reduction over the same period. This is well short of the legally binding commitment to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. Ireland’s new 2030 target under the EU’s Effort Sharing Regulation (ESR) is to limit its greenhouse gas emissions by at least 42% by 2030. This target was set in April 2023 upon amendment of the Emissions Sharing Regulation.

For Ireland to achieve its national and international climate targets, it will require a full and rapid implementation of CAP23 measures and further measures to be implemented.

The Proposed Project will have an export capacity of approximately 63MW and therefore will help contribute towards the achievement of national and international emission reduction targets. As well, it will provide much needed grid infrastructure and the capacity to offset 1,764,240 tonnes of carbon dioxide over its operational lifetime thereby reducing the Greenhouse Gas effect. Please see Section 11.5.2.1.2 for details on carbon offset calculations.

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macaulay Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands*', was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the excel based versions of the tool, was released in 2016 and is currently available as Version 1.7.0 which was last updated in 2022. The tool provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands and was used to assess the effects of the proposed wind farm in terms of potential carbon losses and savings, taking into account removal of carbon sequestering vegetation, and operation of the Proposed Wind Farm. The model calculates the total carbon emissions associated with the proposed wind farm development including manufacturing of the turbine technology, transport, and construction of the development.

The carbon balance of proposed wind farm developments in peatland habitats has attracted significant attention in recent years as, in addition to the combustion of fossil fuels, greenhouse gases are also released through natural processes such as the decomposition of organic material (which is composed of carbon). Bogs and peatlands are known to store large amounts of carbon. There is no peat present within the development footprint at the Proposed Project, therefore the Proposed Project will not give rise to any impact on peat habitat.

Following construction of the Proposed Project, there will be a Permanent Imperceptible Negative Effect on Climate as a result of greenhouse gas emissions from construction plant and vehicles, embodied carbon associated with the turbines and construction materials. Operation of the Proposed Project will have a Direct Long-Term Moderate Positive Effect on climate as a result of reduced greenhouse gas emissions.

1.12

Noise and Vibration

AWN Consulting Limited has conducted an assessment into the likely environmental noise and vibration impacts of the Proposed Project.

The relevant guidance in respect of environmental noise for wind energy developments is '*Wind Energy Development Guidelines for Planning Authorities 2006*' (WEDG) with further detail on the methodology in '*A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*' published by the Institute of Acoustics (IOAGPG).

To inform the noise impact assessment a background noise environment was undertaken to establish the existing baseline and background noise level in the receiving environment. This was done by way of simultaneous wind measurements on the site and noise monitoring at six locations over several weeks, to capture noise levels over a representative set of wind speeds and directions at each location. Typical background noise levels for day and night periods at various wind speeds have been derived from the measured data in accordance with best practice guidance contained in IOAGPG. Prevailing background noise levels are primarily attributable to local road traffic noise and other agricultural and anthropogenic sources in the area. The results of the background noise survey have been used to derived appropriate

operational turbine noise criteria for the development in line with the guidance contained in the 2006 WEDGs.

When considering a development of this nature, the potential noise and vibration effects on the surroundings must be considered for three stages: the short-term construction and decommissioning phases and the long-term operational phase.

The assessment of construction and decommissioning noise and vibration and has been conducted in accordance with best practice guidance contained in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise* and *BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration*. Subject to good working practices as recommended in chapter 4 and Appendix 4-3 Construction Environment Management Plan (CEMP), and specific mitigation where required, it is not expected that there will be any significant noise and vibration impacts associated with the construction phase and the noise from construction activity at the nearest Noise Sensitive Locations (NSL's) is expected to be well below recommended threshold values. The associated construction noise and vibration impacts are not expected to cause any significant effects.

The predicted turbine noise levels have been assessed at all NSL's in accordance with the IOAGPG recommendations. The assessment has confirmed that the residual turbine noise levels associated with the Proposed Wind Farm, existing wind farm development and other proposed wind energy development will be within the best practice noise criteria curves recommended in Irish guidance document, 2006 WEDGs. Likewise, the residual effect for the operation of the proposed onsite 110kV substation is assessed as not significant. Therefore, it is not considered that a significant effect is associated with the Proposed Project.

No significant vibration effects are associated with the operation of the Proposed Project.

In summary, the noise and vibration impact of the Proposed Project is not significant considering best practice guidance for wind turbine developments.

1.13

Landscape and Visual

The potential impacts on sensitive landscape and visual receptors which had potential to experience effects as a result of the Proposed Project were assessed through site visits and various tools, such as the production of verified photomontages, ZTV mapping and Route Screening Analysis (see Appendix 14-1 for methodology) to determine and assess the anticipated visibility of the Proposed Project.

The landscape area where the Proposed Project is located in an extensively flat, agricultural landscape. To the west, prominent topographical features such as Devil's Bit, Kilduff and the Borrisnoe Mountains provide topographical screening of the turbines. ZTV mapping indicates full theoretical visibility within 5km of the proposed turbines, with occasional patches of limited visibility. Apart from local undulations within the LVIA Study Area and the foothills of the Slieve Bloom Mountains to the north of the Proposed Project, there are large areas within 20km of the proposed turbines which have theoretical visibility indicated. On-site surveys found that most prominent visibility is located within 5km of the Site, with intermittent views beyond this distance where the turbines appear as background elements, often screened by intervening vegetation.

During the construction and operational phases, no Significant landscape effects are identified for designated landscape receptors (see Section 14.7.2.1 and Section 14.7.3.1) and it is determined that the addition of the Proposed Project is consistent with the landscape policies set out in the TCDP. In relation to the Devil's Bit Mountains, no Significant landscape effects will arise. Views are confined to the east, where the proposed turbines, although not within this Secondary Amenity Area, appear as small vertical elements seen in conjunction with other existing windfarms.

In terms of effects on landscape character, the proposed turbines are located within an LCA with a sensitivity rating of “Class 1 – Normal Sensitivity”, the second lowest in the TCDP. The Proposed Project is primarily located on agricultural land with a compatibility rating to windfarms of the 2nd highest class in the TCDP, indicating it is "likely to be compatible with reasonable care." As detailed in Appendix 14-2, the Proposed Project's location on land with favourable compatibility ratings for wind energy development suggests the Site's landscape character being generally suitable for this type of project. The LCA's sensitivity, as per the TCDP, is relatively low compared to other LCAs in the county. Considering all above factors, this LCA is deemed to have Low sensitivity to wind energy development, with a Moderate magnitude of change deemed to arise. As detailed in full in Appendix 14-2 a Slight residual effect on the landscape character for this LCA is deemed to arise. Additionally, it is noteworthy that the flat agricultural plain that makes up the majority of this LCA, is capable of accommodating a wind energy development of this scale, given the scale of the landscape and the levels of screening existent within it.

Within the wider LCA Study Area (15km study area for effects on landscape character – see Section 14.2.1), no Significant landscape effects will arise. Tipperary LCA 22 - Devil's Bit Uplands experiences a Moderate residual effect due to its High sensitivity (as reported in Appendix 14-2), with a Slight magnitude of change. Laois LCA 4, also within 5km of the proposed turbines, has a Not Significant residual effect as a result of screening from areas within the LCA. Beyond 5km, views of the proposed turbines are limited to isolated elevated locations, resulting in 'Slight' or 'Not Significant' residual effects on landscape character.

Cumulative effects on landscape character are included in the impact assessment outlined in Appendix 14-2. Cumulative visual effects are also discussed and summarised above in this Chapter. In general, the Site lies within a flat agricultural landscape to the east of the Devil's Bit and Kilduff Mountains with the existing Bruckana, Lisheen I, II and III turbines located approximately 7.9km southeast. The landscape has the capacity to absorb another wind energy development without Significant cumulative landscape effects. The flat terrain and high screening levels prevent wind energy developments from dominating the landscape. In general, views of both the proposed turbines and cumulative turbines in combination will be intermittent as a result of the flat terrain and vegetated landscape. There are some additional cumulative effects due to increased views of turbines within this landscape as a result of the addition of the Proposed Project. However, as outlined above, the low level of visibility of both the proposed turbines and other cumulative turbines within the LVIA Study Area means that no Significant cumulative landscape effects will arise.

The visual assessment found Significant residual effects at 3 of the 14 viewpoints, while others resulted in Moderate (3), Slight (3), Not Significant (1), and Imperceptible (2) effects. The visual assessment of 5 no. designated scenic routes and other visual receptors found no Significant effects within the LVIA Study Area.

Significant visual effects are deemed to arise at three viewpoint locations nearby to Sensitive Properties located within 1km of the proposed turbines. Sensitive Properties near the proposed turbines benefit from a physical landscape buffer created by field structures and vegetation, mitigating visual impacts and providing a sense of scale in relation to setback distance from the turbines. The Proposed Project achieves 4 times tip height set-back distance for all third-party Sensitive Properties, which is set out in the 2019 draft WEDGs for visual amenity purposes. In addition, the viewpoints located between 3-5km from the nearest proposed turbine (VP4 and PWVP-G) show that effects on Sensitive Properties will be dramatically reduced in comparison to the closer receptors identified. It is relevant then, that the population density, recorded during the 2022 Census as 28.06 persons per km², is lower than the national population density and the Tipperary County population density. As the area surrounding the Site has a low population density, site selection for the proposed turbines has resulted in reduced effects on residential visual amenity than might otherwise be the case.

Cumulative visual effects are included in the impact assessment outlined in Appendix 14-3. Cumulative visual effects are limited due to separation distances between the proposed turbines and the cumulative turbines. Even where combined views occur, either set of turbines (proposed or cumulative) will be seen as small background elements (e.g., see VP8, VP14, VP12, VP10). Some locations, primarily to the

southeast and northeast (where proposed and cumulative turbines are located within 5-10km of the viewpoint) will have views of turbines in two directions, however, these locations are limited due to the flat landscape and extensive screening from vegetation. Views of proposed and cumulative turbines will occur from elevated vantage points within the LVIA Study Area (e.g., VP7 and VP2). However, the scale of landscape in view from these locations is capable of effectively accommodating the wind energy developments seen. Finally, the addition of the proposed turbines will have a limited cumulative visual effect in terms of increasing the instances of views of turbines across the LVIA Study Area. However, as these views mainly occur from locations within 5km of the proposed turbines, this will not give rise to any Significant cumulative visual effects. The vegetated landscape in the LVIA Study Area minimizes the visual extent of turbines, enabling the landscape to accommodate multiple developments, as detailed above in Section 14.7.3.4 and in Appendix 14-3.

In conclusion, no significant landscape effects have been identified and significant visual effects only have potential to occur at a low number of residential properties located within 1km of the proposed turbines. Overall, visibility of the Proposed Project throughout the LVIA Study Area is deemed to have no significant effects. The Proposed Project is appropriately designed and suitably scaled, and it has been demonstrated that no significant landscape and visual effects will arise as a result of the Proposed Project.

1.14

Archaeology and Cultural Heritage

This Cultural Heritage chapter was prepared by Tobar Archaeological Services Ltd. It presents the results of an archaeological, architectural and cultural heritage impact assessment of the Proposed Project. The assessment was based on desktop research, field survey, GIS based mapping, ZTV and was also assisted by photowire and photomontage images from certain assets/locations. A detailed examination of the available baseline data was undertaken in addition to a comprehensive site inspection. The latter comprised a walk-over survey of the Site and any proposed infrastructure therein and a windscreen survey and walk-over survey of the Proposed Grid Connection. One recorded monument is located within the proposed Site, however, it is a redundant record and considered non-archaeological. It is also located outside the footprint of any Proposed Project infrastructure.

Where potential impacts have been identified, such as to potential sub-surface archaeology, appropriate mitigation measures have been recommended in order to minimise any such impacts. Recommended mitigation includes a 20m buffer zone around a rectangular crop mark, pre-development archaeological testing of the Proposed Project infrastructure (turbine bases, hardstands, compounds, new roads, grid connection in greenfield areas, etc) and archaeological monitoring during the construction stage of the project.

Potential indirect effects on the setting of any UNESCO World Heritage Sites and those on a Tentative List within 20km, National Monuments within 10km, recorded monuments within 5km and RPS/NIAH structures within 5km were included in order to assess potential effects on setting in the wider landscape.

No UNESCO WHS or those on a Tentative List are located within 20km of the proposed turbines.

The ZTV demonstrates theoretical visibility of 7-9 proposed turbines from the majority of cultural heritage assets within 5km and from one monument subject to a Preservation Order within 10km. Both the distance to the nearest turbine and the number of turbines visible from each cultural heritage asset were used to arrive a level of potential effect on setting. Potential effects on setting are based on the **worst case scenario** in that natural screening, boundaries, buildings and vegetation are not taken into account in the ZTV model and in reality the potential effect is likely to be less. Furthermore, many of these monuments may not be readily discernible in the landscape which further ameliorates effects on setting.

All cultural heritage assets within 100m of either side of the Proposed Grid Connection underground electrical cabling route were assessed for potential impacts to same. No direct impacts to the recorded archaeological, architectural or cultural heritage resource as a result of the proposed underground cabling route have been identified. Mitigation measures are recommended where deemed appropriate and

include archaeological testing of greenfield areas along the proposed route. An assessment of potential impacts as a result of overrun and oversail areas at the minor, temporary turbine delivery accommodating works was also carried out. No direct or indirect impacts to the recorded archaeological or cultural heritage resource were identified.

An assessment of potential cumulative effects was also undertaken taking into consideration other extant planning applications and operational and proposed wind farms within 20km. While some potential cumulative visual effects to the wider setting of cultural heritage assets is possible when considered with the operational and proposed wind farms, no significant cumulative impacts have been identified and no cumulative effects to the immediate setting of cultural heritage assets will occur.

1.15

Material Assets

Roads, Traffic, Transport & Access

Introduction

An assessment of the traffic effects was undertaken for the Proposed Project. The assessment considers the likely impacts resulting from The Proposed Project during the construction, operational and decommissioning phases. The impact that the additional traffic generated by the Proposed Project is assessed on the transport delivery routes, together with a swept path analysis of the route based on the geometric requirements of the abnormally sized vehicles required to deliver the turbine plant to the Site.

Traffic Route & Study Area

The delivery route to the site for the abnormally sized loads required to transport the turbine components to the site (blades, towers and nacelles) commences at Dublin Port with the proposed turbine delivery route following the National and Motorway road networks to reach the first identified pinchpoint on the M7 Motorway approximately 14km to the north of the Town of Templemore, as shown in Figure 15-1a. the proposed turbine delivery route exists the M7 at Junction 22 onto the N62 where it continues for approx. 9.4km before reaching the northwest of the Site. The route turns left onto the L-3248 where the abnormally sized loads will access the site via a new temporary abnormal load access track.

Vehicle types and network geometry

The types of vehicles that will be required to negotiate the local network will be up to 86.9 metres long and will carry a blade 81.5 metres in length.

An assessment of the geometric requirements of the delivery vehicles was undertaken on the delivery route. Locations where it was established that the existing road geometry will not accommodate all of the vehicles associated with the Proposed Project are highlighted, with the extent of remedial works identified. In addition to the assessment presented, it is recommended that a dry run is undertaken by the transport company to check vertical and horizontal clearance on the transport route prior to construction.

Traffic impact on local network

In terms of daily traffic flows it is estimated that the impact of the development traffic on the delivery routes will be as follows:

- > During the 9 days when the concrete foundations are poured, the effect on the surrounding road network will be negative. If the concrete is delivered from the

Turbine Delivery Route (TDR) it is forecast that the increase in traffic volumes will range from +3.5% on the M7 northeast of the Site to +10.8% on the N62 just to the north of the L-3248, to a doubling of traffic flows (+211.1%) on the L-3248, which is currently lightly trafficked. If deliveries are made from other potential routes traffic volumes may increase by up to +10.5% on both the N62 just to the south of the L-3248 and the R433 to the east of Templemore, to +6.9% on the N62 north of Templemore, to +5.3% on the N62 Templemore Main Street. This will have a temporary slight negative effect on the delivery routes with the impact forecast to be moderate on the short section of the L-3248 leading to the main access junction.

- > During the 341 days when general construction materials are delivered to the Site, if materials are delivered via the TDR it is forecast that the increase in traffic volumes will range from +0.9% on the M7 northeast of the Site to +2.8% on the N62 just to the north of the L-3248, to a +54.4% increase on the L-3248 leading to the Site. If deliveries are made from other potential routes traffic volumes may increase by up to +2.7 on the R433 to the east of Templemore. +2.7% on the N62 just to the south of the L-3248, to +1.8% on the N62 north of Templemore, to +1.4% on the N62 Templemore Main Street. This will have a temporary negative effect on the study network ranging from slight on the majority of the delivery routes to moderate on the short section of the L-3248 leading to the main access junction.
- > During the 24 days when the various component parts of the wind turbine plant are delivered to the Site using extended articulated HGVs, the effect of the additional traffic on these days will be slight to moderate along the turbine delivery route due to the size of vehicles involved, resulting in increased traffic volumes ranging from +0.6% on the M7 northeast of the site to +2.0% on the N62 just to the north of the L-3248, to a +38.1% increase on the L-3248 leading to the site. It is forecast that there will be a negative temporary, slight effect on traffic flows as the delivery of the abnormally sized loads is undertaken at night.
- > During the 9 days of the turbine construction stage when general materials are delivered to the Site for the Proposed Wind Farm, it is forecast that the increase in traffic volumes on these days will range from +0.4% on the M7 northeast of the site to +1.2% on the N62 just to the north of the L-3248, to a +23.2% increase on the L-3248 leading to the site. This will have a temporary imperceptible negative effect on the M7, and temporary slight negative effect on the rest of the delivery routes.
- > With respect to the traffic volumes that will be generated during the construction of the underground grid connection cable route along 870m of L-7039, it is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 4 return trips made by a car to transport construction staff, to and from the Site. Short term diversions are forecast for local traffic although the traffic volumes that will be impacted on the local road network are low. By its nature the effects of these additional trips and diversions on the network will be transient, will be temporary and will be slight.

Once the Proposed Project is operational the traffic impact created by maintenance staff will be imperceptible. The residual effect for the decommissioning phase will be less than for the construction stage as set out above and will be slight to imperceptible.

Irish Rail

The Dublin-to-Cork Irish Rail line runs in a northeast to southwest direction approximately 20m south of the proposed Grid Connection underground cabling route. The Railway bridge OBC 202 is located approximately 30m from the proposed underground cabling route. No Proposed Project infrastructure will physically interact with the railway line. There is no requirement to cross Railway bridge OBC 202. There will be no interference with the railway slope embankment or zone of influence of 5m. The proposed underground cabling route will run at a minimum of 20m north of the railway track and

therefore sufficient setback is incorporated into the design. Cognisance has been taken of requirements for third parties as set out in CCE (Chief Civil Engineers) guidance documents for third parties working near railway infrastructure. Additionally, contact will be made to Iarnród Éireann Designated Representative (IEDR) 30 days prior to the works that will take place adjacent to the CIE infrastructure. Therefore, the effects from the Proposed Project on Irish Rail infrastructure during the construction, operation and decommissioning of the Proposed Project are imperceptible.

Telecommunications and Aviation

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, affecting, for example, radio signals. The most significant potential effect occurs where the wind farm is directly in line with the transmitter radio path.

During the development of any large project that holds the potential to affect telecoms or aviation, the Developer is responsible for engaging with all relevant Telecoms Operators and the relevant Aviation Authorities to ensure that the proposal 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 mitigatory measures are in place.

A total of 3 no. telecommunications links pass over the Site, 2 no. links run along the northwestern and southeastern boundaries away from proposed infrastructure and just 1 no. link passes through the centre of the Site in the vicinity of a proposed wind turbine. Appropriate buffer zones, agreed with the telecommunications operators, have been applied to these links. As such, no electromagnetic interference impacts for telecommunications assets or operations are associated with the Proposed Project.

The Site is located within Military Operation Area 5. Protocol as set out in the Tall Structures Position Paper is to notify the Department of Defence should a developer wish to erect a structure taller than 45m in this area. Correspondence was made with the Department of Defence regarding the Proposed Project who stated that “*any determination in relation to a planning consent is solely a matter for the planning authorities and/or ABP, as appropriate*”. Please see Appendix 2-1 and Chapter 15 for details.

There are no airports or aerodromes located within or adjacent to the Site. The nearest licenced aerodrome is located at Birr, approx. 26km north of Site. However, notification will be given to the Irish Aviation Authority 30 days prior to erection of the turbines and a data share of turbine coordinates and dimensions will be provided, as requested.

Utilities

The Ikerrin to Thurles 110kV overhead transmission line traverses the Site in a northeast to southwest orientation in the townlands of Strogue and Clonmore, approximately 2km from the nearest proposed turbine (T8). A 38kV line traverses the northwest corner of Site in the townland of Knockanroe, approximately 800m from the nearest proposed turbine (T2).

There is no gas network Ireland infrastructure within or near the Site.

The Site does not fall within any Public Water Scheme or Source Protection Area. A water main runs along the R433 which will be crossed by the Proposed Grid Connection underground cable route. Mains valves are located approx. 5m from the Proposed Grid Connection underground cable route also.

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the Site. The closest, authorised municipal waste facility is located approximately 18km south of the Site in Thurles, Co. Tipperary.

With the implementation of best practice measures and all mitigation and monitoring measures set out in Chapter 15, the effects on utilities and waste management listed above range from slight to imperceptible for the short-term construction phase and decommissioning phases. For the operational phase, the effects will be imperceptible for all except electrical supply as the Proposed Project will have a **long-term slight positive effect on national electricity supply**.

1.16

Vulnerability of the Project to/from Major Accidents and Natural Disasters

This section of the EIAR describes the likely significant effects on the environment arising from the vulnerability of the Proposed Project as detailed in Chapter 4 to risks of major accidents and/or natural disasters.

Major accidents or natural disasters are hazards which have the potential to affect the Proposed Project and consequently have potential impacts on the environment. These include accidents during construction and operation caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e., population and human health, biodiversity, ornithology, land, soil, water, air quality, climate and material assets, cultural heritage and the landscape.

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster. Local and regional context has been established prior to undertaking the risk assessment to develop an understanding of the vulnerability and resilience of the area to emergency situations.

Further detail on the baseline environment is provided in Section 16.3 of this EIAR,

The scenario with the highest risk score in terms of the occurrence of major accident and/or disaster was identified as 'Contamination' of the Proposed Project site and risk of Fire/Gas Explosion' during the construction phases, 'Fire/Gas Explosion' during operational phase and 'Contamination' during the decommissioning phase.

The Proposed Project has been designed and built in accordance with the best practice measures set out in this EIAR and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design.

The risk of a major accident and/or disaster during the construction of the Proposed Project is considered 'low' in accordance with the '*Guide to Risk Assessment in Major Emergency Management*' (DoEHLG, 2010).

When the implementation of best practise measures and all proposed mitigation and monitoring measures detailed in the EIAR is implemented, the residual effect(s) associated with the construction, operation and decommissioning of the Proposed Project are not significant.

1.17

Interactions of the Foregoing

Chapter 17 of this EIAR identifying the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity, Birds, Land, Soils and Geology, Water, Air Quality, Climate, Noise and Vibration, Landscape and Visual, Cultural Heritage, Material Assets and Vulnerability to Major Accidents and Disasters, as a result of the Proposed Project. All potential significant effects of the Proposed Project and the measures proposed to mitigate them have been outlined in the

main EIAR. However, for any development with the potential for significant environmental effects there is also the potential for interaction between these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them or have a neutral effect. A matrix is presented in Chapter 17 of the EIAR to identify interactions between the various aspects of the environment already discussed in the EIAR. The matrix highlights the occurrence of potential positive or negative impacts during the construction, operational and decommissioning phases of the Proposed Project. Where any potential interactive impacts have been identified, appropriate mitigation is included in the relevant sections (Chapters 5–16) of the EIAR.