EIAR Volume II

Main Report

Chapter 1: Introduction and Background

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FIGURES

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by RSK Ireland and other companies within the RSK Group, along with associated specialist consultants, on behalf of Tullacondra Green Energy Limited. The EIAR is submitted in respect of an application for planning permission to construct and operate the Tullacondra Green Energy Project in north County Cork ("the Project").

The proposed Project includes a nine-turbine wind farm on a site that is located at its nearest point approximately 2 kilometres (km) south of Lisgriffin Cross, Co. Cork, and an underground grid connection from the wind farm site to the boundary of the Mallow 110 kilovolt (kV) substation located at St. Joseph's Road, Mallow. Of the two grid connection route options examined in the EIAR (as shown in **Figure 1.1**), only one route (Option 1) is included in the application for planning permission. The EIAR also presents an assessment of potential effects from the proposed temporary accommodating works that will be implemented along two option routes from ports of origin in Foynes and Cork for delivery of large components to the site (as shown in **Figure 1.2**). These temporary accommodating works which will include temporary removal of street furniture, modifications of roundabouts, creating temporary surfaces in road verges and clearing / trimming vegetation do not require planning permission and therefore do not form part of the works for which planning permission is sought.

A planning application for the Project is made to Cork County Council under Section 34 of the Planning and Development Act, 2000 (as amended). The application is for a 10-year duration planning permission and a 35-year operational life from the date of commissioning of the entire wind farm.

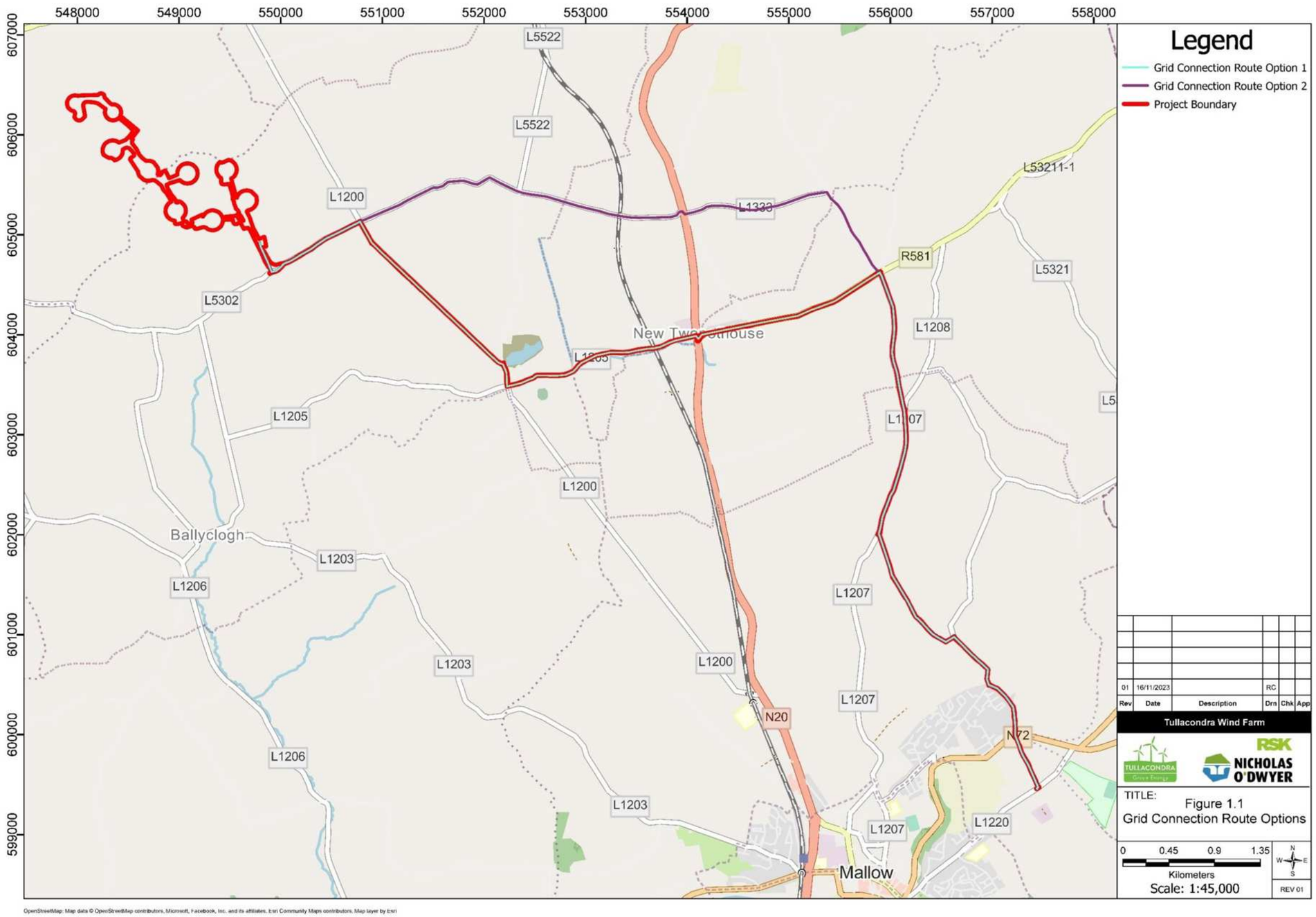

Figure 1.1: Grid connection route options

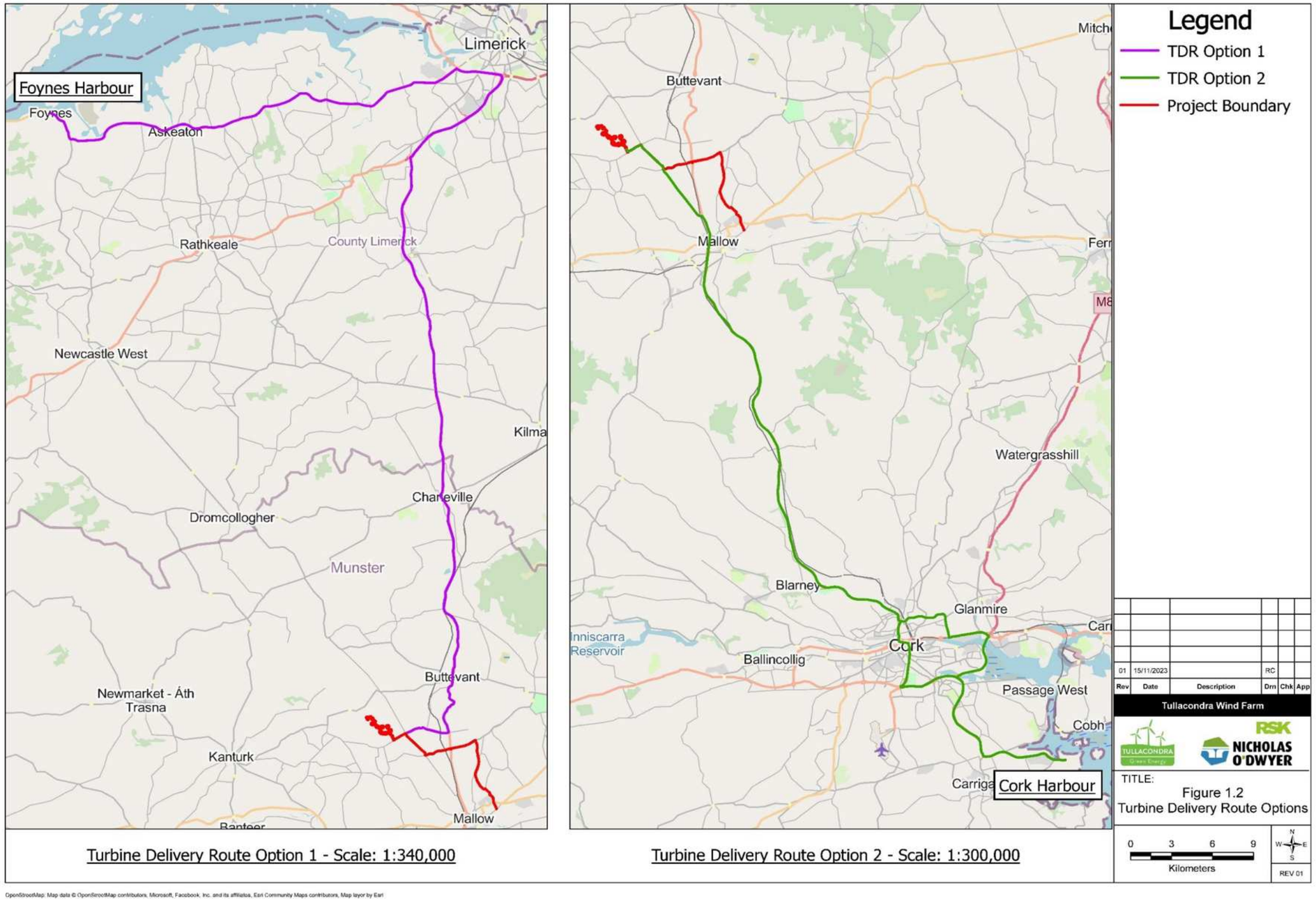

Figure 1.2: Turbine delivery route options

1.2 Background to the Project

The Project is proposed in response to international, European and national policy on climate change and reduction in carbon emissions. Ireland's participation in international action on climate change, which seeks to limit global temperature rise to 1.5 degrees Celsius above pre-industrial levels, is confirmed in the country's ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002. Ireland's national energy and climate policy is derived from overarching European policy aimed at unifying the European Union in energy and climate goals.

The National Planning Framework has a main objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to 2030 and 2050 targets for reducing greenhouse gas (GHG) emissions. The country is now on a legally binding path to achieving net-zero emissions no later than 2050, and to a 51% reduction in emissions by 2030. The route to achieve these targets is set out in the government's Climate Action Plan (2024)[1] which seeks to achieve 50% of electricity demand being met by renewables by 2025. That target will be achieved by increasing the installed capacity of onshore wind to 6GW by 2025 and 9GW by 2030.

The Cork County Council Wind Energy Strategy (2014), as contained in the Cork County Development Plan 2022 – 2028[2], has designated areas for wind energy development outside urban areas as either 'Open to Consideration', 'Acceptable in Principle' or 'Normally Discouraged'. The site of the proposed wind farm development is located entirely within an area designated in the Cork County Development Plan, 2022 – 2028 as 'Open to Consideration' for wind energy development.

1.3 Site location

The proposed wind farm is located approximately 2km south of Lisgriffin Cross, Co. Cork. The proposed grid connection includes works a length of approximately 13.5km in and alongside public roads to install cabling to connect the wind farm to the National Grid at the boundary of the Mallow 110kV substation located in St. Joseph's Road, Mallow. The proposed wind farm site and the route of the proposed grid connection for which planning permission is sought (indicated by the red line planning boundary) is shown in **Figure 1.3** and includes a total area of 58.6 hectares (ha). The townlands in which the proposed Project is located are listed in **Table 1.1**.

[1] Government of Ireland. 2024. Climate Action Plan 2024.

[2] Cork County Council. 2022. Cork County Development Plan 2022-2028.

Table 1.1: Townlands and Electoral Districts in which the proposed Project is located

Proposed development	Townlands
Wind energy project inclusive of turbines, site access tracks, substation, and construction compound	Polnareagha and Ardskeagh (Templemary E. D.); and Tullacondra and Croughta, (Kilmaclenine E. D.).
Grid connection route from wind farm site to Mallow 110kV substation	Kilmaclenine, Croughta, Knockaunavaddreen, and Copestown (Kilmaclenine E. D.); Ballybeg (Buttevant E. D.), Baltydaniel East, Twopothouse, and Curraghkerry (Caherduggan E. D.); Ballyviniter Upper, Cloghlucas North, Curraghphadeen, Ballyviniter Middle, Ballyviniter Lower, Parkadallane, Carrigoon More and Carrigoon Beg (Mallow Rural E. D.).

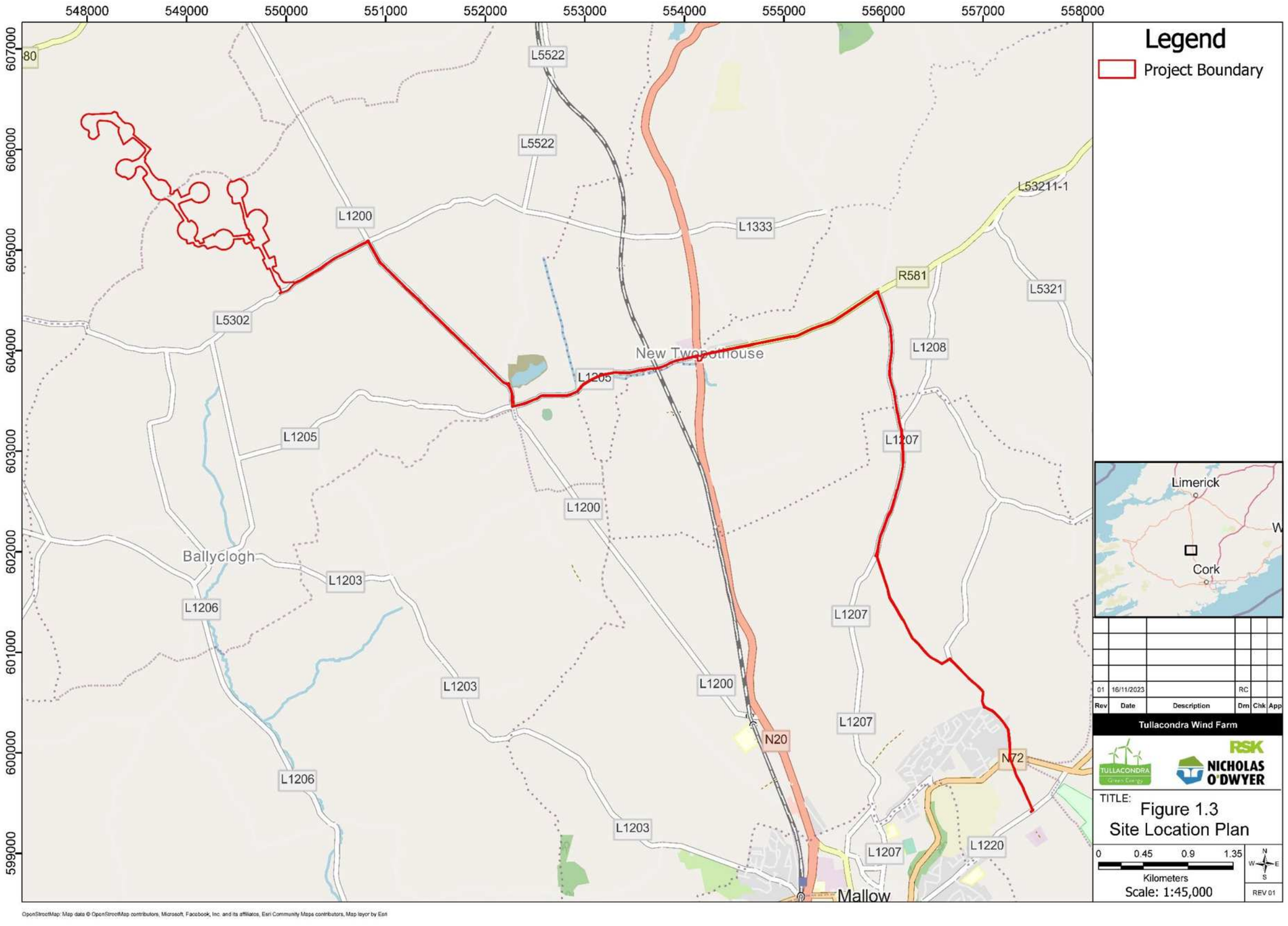

Figure 1.3: Site location plan

1.4 Description of the site and surrounding area

The wind farm site for the proposed Project is located along the L5302 at Croughta and consists primarily of mixed farmland habitat with hedgerows and occasional areas of scrub, ponds and lakes and man-made drains and ditches. The area in which the turbines will be located ranges in elevation from 133m above Ordnance Datum (AOD) in the south to 120m AOD in the north. The settlement pattern within approximately 2km from the proposed turbine locations is characterised by dwellings and farm buildings located mainly along the public roads, with some older and newer dwellings located down long private lanes. In some cases, newer dwellings have been built closer to the road, whilst the older dwelling remains at the end of the private lane, and some have been subsumed into the farmyard, being surrounded by sheds. The few commercial properties in the area include on-farm enterprises which are associated with a residence.

The works for installation of the underground cabling to connect the wind farm site to the boundary of the Mallow 110kV substation via two option routes are predominantly within the public road corridors of local and regional roads, crossing the N20 national primary road and the N72 national secondary road.

There are two option routes for delivery of turbine components from ports at Foynes and Ringaskiddy. The temporary accommodating works for delivery of turbine components will be within and immediately adjacent to the public road corridors of national primary and secondary roads (N69, N20, N28, N27, N8) and local roads.

1.5 The proposed development

The proposed Project includes the construction, operation and decommissioning of a wind energy development consisting of nine wind turbines with foundations and crane pad hardstanding areas; a permanent meteorological mast; an on-site 38kV substation, underground cabling connecting the turbines to the on-site substation; and underground grid connection to the boundary of the Mallow 110kV substation; along with all associated site works including site clearance, temporary compounds and storage areas; a new temporary entrance and upgrade of an existing entrance; upgrade of existing site tracks and construction of new site tracks; site drainage; and ancillary developments including security gates and fencing, lighting and signage; and biodiversity mitigations and enhancements.

The site layout plan of the proposed wind farm is shown in **Figure 1.4.**

As the Mallow 110kV substation is a live station, ESB Network (ESBN) safety rules will apply from the substation boundary. ESBN will be responsible for the routing of the grid connection cable through the Mallow 110kV substation compound and the connection to one of the existing cable bays within the substation. The works anticipated would include laying a trench from the substation switchgear building to the substation boundary where it will connect to the grid connection route for the Project. The EIAR presents an assessment of the potential effects from the grid connection within the Mallow 110kV substation. However, these works do not form part of the development for which planning permission is sought and will be subject to a separate planning application.

Further details of the proposed Project, the construction programme and sequencing of works which are used as the basis for assessments in this EIAR are provided in **Chapter 5 Project Description.**

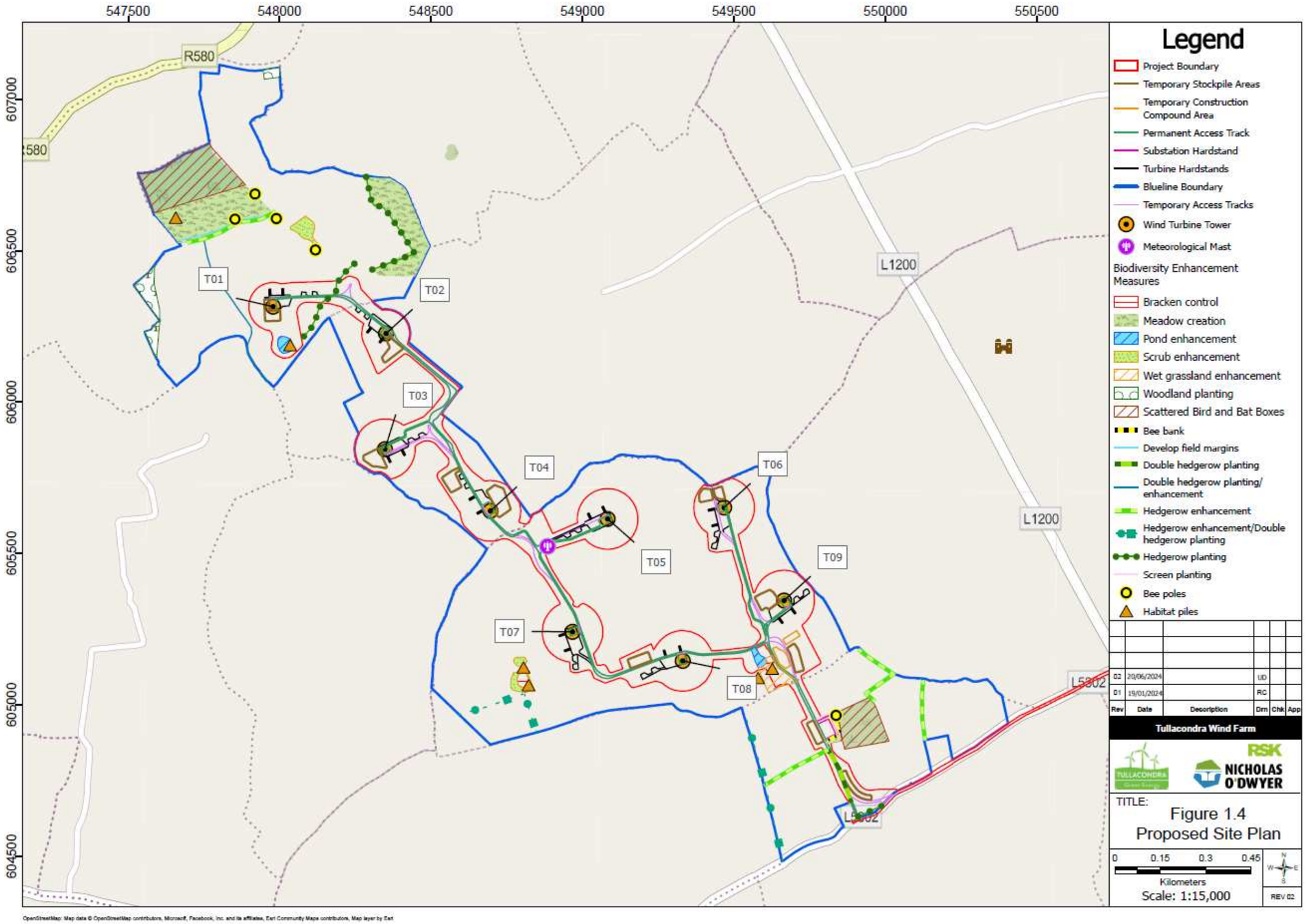

Figure 1.4: Proposed wind farm site layout plan

1.6 The planning application

The planning application documentation is presented in four Parts and contains the requisite forms, statutory notices, and the supporting documentation and planning drawings listed below.

- Part 1 includes the Planning Application Form and Supporting Documents as follows:
    - Section 1 Planning Application Form
    - Section 2 Landowner Consents
    - Section 3 EIA Portal Confirmation of Notification
    - Section 4 Class of Development
    - Section 5 Planning Fee Calculation
    - Section 6 Newspaper Notice
    - Section 7 Site Notice
    - Section 8 Planning Report
- Part 2 includes all Planning Drawings (A1 drawings) including a Schedule of Drawings
- Part 3 is the EIAR, presented in four Volumes as follows:
    - Volume I Non-Technical Summary (NTS)
    - Volume II Main Report
    - Volume III Appendices
    - Volume IV Visualisations
- Part 4 Appropriate Assessment Reporting

1.7 The applicant

The applicant is Tullacondra Green Energy Limited, a subsidiary of Greensource Sustainable Developments Limited, which is an Irish owned and managed renewable energy company based in Adare, Co. Limerick.

Greensource is an innovative Irish renewable energy company that specialises in the development of renewable energy projects, working with communities from pre-planning stage to operational stage, and creating long lasting local partnerships. Greensource has a highly skilled and experienced team who are committed to developing projects with successful outcomes for all stakeholders. Working with integrity and care for the local environment, the team has a strong track record with over ten years development and operational experience of renewable energy projects in Ireland.

1.8 Landowners

Consent for the making of the planning application has been provided by the owners of lands within the red line planning boundary. Refer to **Section 2** of the planning application documentation.

1.9 The EIAR

The process by which the likely significant effects of a project on the environment are assessed is set out in the EU EIA Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (codification) which was transposed to Irish planning legislation law through the Planning and Development (Amendment) Act 2010. The EU EIA Directive was later amended (Directive 2014/52/EU), and this was transposed to Irish planning law through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations S.I. 296 of 2018.

1.10 The EIAR team

Article 5(3)(a) of the amended EIA Directive states that *"the developer shall ensure that the environmental impact assessment report is prepared by competent experts"*. The Environmental Protection Agency (EPA) Environmental Impact Assessment Report Guidelines (2022)[3] highlight the need for competent experts to be involved in the EIA process and in the preparation of the EIAR. Environmental specialists from RSK coordinated and managed the preparation of the EIAR and led a team of competent experts in preparing specialist chapters.

Laurie McGee, Associate Director with RSK Environment Limited, was the Project Manager for the EIAR. She has over 30 years of experience in town and environmental planning consultancy in Ireland, the UK and the USA, with specialist experience in wind and renewable energy EIA and planning and community and stakeholder engagement in Ireland and Northern Ireland since 2006. Laurie also authored the forerunning chapters of the EIAR with input from technical experts from the RSK Project team.

The forerunning and concluding chapters (see Table 1.2) of the EIAR were prepared by experts from the Environment and Planning team at Nicholas O'Dwyer Ltd. (part of the RSK Group), with technical oversight from Principal Environmental Consultant, Krista Farrugia. Krista is a Principal EIA Consultant with 20 years of experience in the field of EIA. She holds a Master of Science in Integrated Environmental Management from the University of Bath, a Post Graduate Diploma in Wildlife Biology and Conservation from Edinburgh Napier University, and a Bachelor of Science (Honors) in Chemistry and Biology from the University of Malta. She is a Practitioner with the Institute of Environmental Management with extensive experience in EIA coordination, environmental auditing, Strategic Environmental Assessment (SEA), ecological studies Appropriate Assessment, and landscape and visual assessment.

[3] Environmental Protection Agency. 2022. Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

In each environmental factor chapter in the EIAR, contributing experts provide their statement of authority and an explanation of the methods of data collection and assessments of significance that were carried out with reference to applicable discipline or industry standards and government guidance, and noting any limitations in relation to data collection or surveys.

Each contributing expert prepared a non-technical summary of their chapter which was compiled for the Non-Technical Summary contained in **Volume I** of the EIAR. Summary EIAR chapters, **Chapter 19 Interactions and Cumulative Effects** and **Chapter 20 Summary of Mitigation Measures**, were drawn from each of the environmental factor chapters.

Table 1.2 lists the competent experts who were involved in conducting baseline surveys and authoring the environmental factor chapters of the EIAR.

Table 1.2: EIAR factor chapters and competent experts

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 1: Introduction and Background Chapter 2: EIA Methodology Chapter 3: Scoping, Consultations, Community Engagement and Key Issues Chapter 4: Project Need and Alternatives Considered Chapter 5: Project Description	RSK Environment	Laurie McGee	BA (Hons), Pg Dip and MA. Laurie McGee is a Corporate member of the Irish Planning Institute and the Royal Town Planning Institute and an Affiliate member of the Institute of Environmental Management and Assessment. Laurie is an Associate Director with RSK Environment Limited, working mainly in wind and other renewable energies. Laurie has over 30 years of experience in town and environmental planning consultancy in Ireland, Northern Ireland, England, Scotland and the USA, with specialist expertise in community and stakeholder engagement in Ireland. She has authored chapters for EIAR (e.g., forerunning and summary chapters, population and human health, and shadow flicker) for numerous wind farms in Ireland and Northern Ireland and has provided expert witness for planning and shadow flicker for many planning appeals in Northern Ireland.
	Nicholas O'Dwyer Ltd.	Krista Farrugia	Krista Farrugia is a Principal EIA Consultant with 20 years of experience in the field of EIA. Krista holds a Master of Science in Integrated Environmental Management from the University of Bath, a Post Graduate Diploma in Wildlife Biology and Conservation from Edinburgh Napier University, and a Bachelor of Science (Honors) in Chemistry and Biology from the University of Malta. She is a Practitioner with the Institute of Environmental Management with extensive experience in EIA coordination, environmental auditing, SEA, ecological studies, Appropriate Assessment and landscape and visual assessment. Projects have included the assessment of a wide range of developments, including residential and commercial, waste management facilities, roads, port development, coastal infrastructure, and aquaculture. Krista has worked extensively in Malta and more recently in Ireland.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 6: Population and Human Health	RSK Environment	Laurie McGee	BA (Hons), Pg Dip and MA. Laurie McGee is a Corporate member of the Irish Planning Institute and the Royal Town Planning Institute and an Affiliate member of the Institute of Environmental Management and Assessment. Laurie is an Associate Director with RSK Environment Limited, working mainly in wind and other renewable energies. Laurie has over 30 years of experience in town and environmental planning consultancy in Ireland, Northern Ireland, England, Scotland and the USA, with specialist expertise in community and stakeholder engagement in Ireland. She has authored chapters for EIAR (e.g., forerunning and summary chapters, population and human health, and shadow flicker) for numerous wind farms in Ireland and Northern Ireland and has provided expert witness for planning and shadow flicker for many planning appeals in Northern Ireland.
Chapter 7: Biodiversity	RSK Biocensus	Nick Henson	CEnv MCIEEM Nick Henson has more than 18 years' experience of ecological work, including extensive experience with assessing potential ecological effects of wind farm projects in the UK and Ireland. He has a Master's Degree in Environmental Sciences, is a Full Member of the Chartered Institute of Ecology and Environmental Management and a Chartered Environmentalist.
		Thomas Webb	Thomas Webb is an ecological consultant who has over two years' experience of undertaking ecological impact assessments and authoring technical reports, including EIAR chapters. He has a Bachelor of Sciences degree in Zoology and a Master of Science degree in Species Identification and Survey Skills, which included time spent working within the ecology industry. He is a Qualifying member of the Chartered Institute of Ecology and Environmental Management.

EIAR Chapter	Company	Expert	Qualifications and Experience
- Bat Baseline Report	Eire Ecology	John Curtin	John Curtin has over 10 years' experience of conducting bat assessments for wind farm projects. He has also completed the Bat Conservation Ireland, Bat Detector Workshop and Bat Handling Workshop courses, which are the standard training for bat surveys in Ireland. In addition, John is a council member (Co-Chair and Company Secretary) of Bat Conservation Ireland, which monitor national bat populations, and facilitate education about bat communities to the public.
- Aquatic Ecology Report	Ecology Research and Solutions Ltd.	Rory Dalton	Rory Dalton holds a BSc Honors Environmental Science from UCC and has over 12 years of experience working with environmental, ecological and engineering consultancies, with 9 years working as an independent ecological consultant.
Chapter 8: Ornithology	RSK Biocensus	Nick Henson	CEnv MCIEEM Nick Henson has more than 18 years' experience of ecological work, including extensive experience with assessing potential ecological effects of wind farm projects in the UK and Ireland. He has a particular specialism in undertaking ornithology surveys and assessments. He has a Master's Degree in Environmental Sciences, is a Full Member of the Chartered Institute of Ecology and Environmental Management and a Chartered Environmentalist.
- Ornithology Baseline Report		George Wilkinson	George Wilkinson is a Senior Ecologist who has over 5 years' experience in working with protected habitats and species, identifying and addressing ecological constraints. He has an MSc in Species Identification and Survey Skills from the University of Reading, and a BSc in Biology from the University of Bristol. He is also an Associate member of CIEEM.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 9: Hydrology and Hydrogeology	RSK Ireland	Sven Klinkenbergh	Sven Klinkenbergh is a Principal Environmental Consultant at RSK Ireland. Sven joined RSK Ireland after Minerex Environmental (8 years) were acquired by RSK Group in June 2021. Sven's current workflow consists primarily of EIA Hydrology, Hydrogeology, Land, Soils and Geology assessments for a range of projects, a large proportion of which is in renewable energy i.e. wind farms on peatlands. Sven is a qualified project manager and EIA Lead Author with c. 10 years industry experience in the preparation of environmental, geological, hydrological and hydrogeological reports. Sven has also worked on a large number of surface water and groundwater monitoring projects on IPC and similar sites, was team lead for site investigation and soil waste classification projects and has a number of years' experience on construction dewatering projects.
		Jayne Stephens	Jayne Stephens is an Environmental Consultant with RSK Ireland. Jayne has 10 months experience in EIAR reports. Experience c. 5 years working in microbiology, water, and environmental disciplines. She graduated with a BSc in Environmental Science from National University of Ireland Galway in 2014, majoring in mammal ecology. Following this, Jayne was the successful Irish applicant to the Tropical Biological Association in Cambridge to complete a field course in tropical biodiversity and conservation in Tanzania. She holds a PhD in environmental microbiology, graduating in 2023. Jayne has worked on a large number of bathing water and surface water monitoring investigations, on project Acclimatize, an EU funded project which aimed to bridge the knowledge gap in relation to at-risk urban and rural bathing waters in Ireland and Wales. During this project, Jayne was team lead for site investigations and has a number of years' experience on microbial contamination and public involvement projects for better water quality with 7 published papers.

EIAR Chapter	Company	Expert	Qualifications and Experience
		Chris Fennell	Chris Fennell is a Principal Hydrogeologist Consultant at RSK with over 6 years' experience. Chris holds a B.A (mod) Environmental Science and a PhD in Hydrogeology (Environmental Protection Agency Studentship).
Chapter 10: Land, Soils, and Geology	RSK Ireland	Sven Klinkenbergh	Sven Klinkenbergh is a Principal Environmental Consultant at RSK Ireland. Sven joined RSK Ireland after Minerex Environmental (8 years) were acquired by RSK Group in June 2021. Sven's current workflow consists primarily of EIA Hydrology, Hydrogeology, Land, Soils and Geology assessments for a range of projects, a large proportion of which is in renewable energy i.e. wind farms on peatlands. Sven is a qualified project manager and EIA Lead Author with c. 10 years industry experience in the preparation of environmental, geological, hydrological and hydrogeological reports. Sven has also worked on a large number of surface water and groundwater monitoring projects on IPC and similar sites, was team lead for site investigation and soil waste classification projects and has a number of years' experience on construction dewatering projects.
		Deirdre Walsh	Deirdre Walsh – B.A.Mod (Geology), M.Sc. (Geoscience), PhD (Geomodelling). Deirdre has a background in exploration geology (c. 2 years) and geoscience research (c. 8 years). Since joining RSK Ireland, Deirdre has worked on a variety of projects including renewable energy and urban developments, preparing Environmental Impact Assessment Report chapters and Stability Risk Assessments.
		Chris Fennell	Chris Fennell is a Principal Hydrogeologist Consultant at RSK with over 6 years' experience. Chris holds a B.A (mod) Environmental Science and a PhD in Hydrogeology (Environmental Protection Agency Studentship).

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 11: Material Assets (utilities, waste, and telecommunications and aviation)	Nicholas O'Dwyer Ltd.	Ursula Daly	Ursula Daly is a Senior Environmental Consultant at Nicholas O'Dwyer who has over 8 years of experience in preparing EIARs for renewable projects such as solar farms and biogas facilities. She has a BSc in Land Use and Environmental Management from Queen's University, Belfast. She is a full member of the Chartered Institution of Water and Environmental Management (CIWEM). Ursula has prepared numerous environmental impact assessment report chapters for various developments such as major infrastructural developments, mixed use developments and renewable energy development projects.
- Telecommunications Impact Study Report - Aviation Review Statement	Ai Bridges Ltd.	Kevin Hayes	Kevin Hayes is the Founding Director and Engineering Contracts Manager in Ai Bridges Ltd. Kevin has over 20 years' experience in telecommunications network design, aviation impact studies and project management. Kevin has a B. Eng Hons in Electronic Engineering – Communications & Industrial Automation and M. Eng Hons in Electronic Engineering- Communications & Communications Engineering. He also managed and designed the software prediction model for the TVI & Broadband EMI Interference Studies for Wind Farms.
Chapter 12: Shadow Flicker	ADAS Ltd.	Thomas Burke	Thomas Burke is a GIS (Geographic Information Systems) Consultant with expertise in the evaluation, analysis, and visualisation of geospatial data to investigate and solve environmental management issues. Thomas uses these skills and experience to manage and deliver projects for a range of clients, particularly in the area of onshore renewables development. Prior to joining RSK ADAS, Thomas gained a PhD in Geography and MSc in Earth and Environmental Science.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 13: Noise and Vibration	RSK Ireland	James Mangan	James Mangan is Associate Director of RSK Ireland Ltd. and leads the acoustics team in Ireland. James has completed the Institute of Acoustics (IoA) Diploma in Acoustics and Noise Control and is a Member of the Institute of Acoustics (MIOA). He has over 20 years' experience working in the field of acoustics, sixteen years of which working in Ireland. He has prepared numerous environmental impact assessment report chapters for various developments such as major infrastructural developments, mixed use developments and wind energy development projects. James is the current Chair of the Irish Branch of the IoA.
Chapter 14: Landscape and Visual	Stephenson Halliday	Ken Halliday	Ken Halliday (CMLI) has over 25 years of experience of LVIA and is the lead author. Ken is a Chartered Landscape Architect with many years of experience. He has considerable experience in LVIA, townscape and visual impact assessments, landscape sensitivity and capacity studies and feasibility studies.
Chapter 15: Archaeology and Cultural Heritage	ADAS	Diarmuid O'Seaneachain	Diarmuid O'Seaneachain is an Associate Director in ADAS and has experience in assessing the impacts of development on buried archaeology, historic buildings and historic landscapes. He has extensive experience of archaeological planning advice, desk-based assessments, built heritage impact assessments, archaeological mitigation strategies and project management of archaeological fieldwork. He has Bachelor of Arts (BA) Archaeology and French from National University of Galway, Ireland and a Doctorate degree in Historic Landscape Archaeology from National University of Galway, Ireland.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 16: Traffic and Transport	Nicholas O'Dwyer Ltd.	Mark Dignam	Mark Dignam is a Director and Chartered Engineer in Nicholas O'Dwyer with over twenty-five years' experience in project management and design of infrastructural and structural engineering projects of all sizes and levels of complexity. He has a Master of Science in Construction Project Engineering from the University of Reading, Masters of Engineering in Structural Analysis and Design from National University of Ireland, Galway and a Bachelor's of Engineering from University of Galway. Mark has worked as civil works designer in a number of roads and public spaces projects. He has been involved in the preparation of Traffic Impact Assessments, Road Safety Audits and Mobility Management Plans for numerous projects.
Chapter 17: Air Quality	RSK Environment Ltd.	Phoebe Chan	Phoebe Chan is a senior air quality consultant at RSK Environment Limited. She is an associate member of the Institute of Environmental Science (AMIEnvSc) and an associate member of the Institute for Air Quality Management (AMIAQM). Phoebe has two years' experience as a project manager for air quality consultancy and modelling, including EIAR and development planning applications. She has prepared environmental impact assessment reports for various solar farms and wind farms, for example Green Nation Solar Farm.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 18: Climate		Danielle King Jamie Blunden	Danielle King is the Head of Climate Change Strategy and Decarbonisation at the RSK Centre for Sustainability Excellence. She is responsible for leading a team of climate change adaptation, mitigation, and finance specialists to deliver services in line with the Paris Agreement and UN Sustainable Development Goals. Regarding her own skills and experience, Danielle specialises in the delivery of climate change impact assessment and management. In particular, she is responsible for greenhouse gas assessment and verification services, climate change risk and opportunity assessment and disclosure services, and the development of sustainability strategy and policy. In support of these services, Danielle has undertaken postgraduate studies in International Energy Law and Policy, and in Resilience and Change Management. She has further undertaken a course in Climate Services for Adaptation delivered through partnership of the Wageningen University, The European Commission and the European Centre for Medium-Range Weather Forecasts. Jamie Blunden is a Senior Environmental Consultant within Nature Positive's Carbon & Sustainability team. He assists clients with building and infrastructure life cycle carbon assessments, company carbon footprint assessments, BREEAM assessments, and construction carbon management plans. He has experience in completing whole life carbon assessments for large scale infrastructure projects and interacting with design teams to provide bespoke carbon and sustainability consultancy. Jamie has created custom tools to assist construction projects in identifying carbon hotspots and reporting their carbon emissions to clients. Before RSK, he worked within construction environmental management, developing experience in environmental management systems and monitoring compliance obligations. He is also experienced in the coordination and submission of BREEAM assessments to support development consent applications to local authorities.

EIAR Chapter	Company	Expert	Qualifications and Experience
Chapter 19: Interactions and Cumulative Effects	Nicholas O'Dwyer Ltd.	Krista Farrugia	Krista Farrugia is a Principal EIA Consultant with 20 years of experience in the field of EIA. Krista holds a Master of Science in Integrated Environmental Management from the University of Bath, a Post Graduate Diploma in Wildlife Biology and Conservation from Edinburgh Napier University, and a Bachelor of Science (Honors) in Chemistry and Biology from the University of Malta. She is a Practitioner with the Institute of Environmental Management with extensive experience in EIA coordination, environmental auditing, Strategic Environmental Assessment (SEA), ecological studies and Appropriate Assessment and landscape and visual assessment. Projects have included the assessment of a wide range of developments, including residential and commercial, waste management facilities, roads, port development, coastal infrastructure, and aquaculture. Krista has worked extensively in Malta and more recently in Ireland.
Chapter 20: Summary of Mitigation Measures			

1.11 Availability of the EIAR

The EIAR and documentation associated with the planning application will be available for viewing on Cork County Council's website under the relevant planning reference number once assigned by the Planning Authority on lodgement of the planning application.

The EIAR may also be inspected free of charge and copies of same purchased by any member of the public during normal opening hours at the following address:

Planning Department

Cork County Council

County Hall

Carrigrohane Road

Cork, T12 R2NC

The EIAR can also be accessed via a link in the Department of Housing, Local Government and Heritage's EIA Portal, which will provide a link to the planning application on the Planning Authority's website. The EIA Portal can be accessed at https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1.

Information about the proposed Project, including periodic updates on the consenting process, will be provided at www.tullacondragreenenergy.ie.

EIAR Volume II

Main Report

Chapter 2: EIA Methodology

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APPENDICES (EIAR Volume III)

2 EIA METHODOLOGY

2.1 Introduction

The process by which the likely significant effects of a project on the environment are assessed is set out in the EU Environmental Impact Assessment (EIA) Directive 2011/92/EU and the amended EIA Directive (Directive 2014/52/EU). Collectively, these are referred to as the EIA Directive.

As noted in the Department of Environment, Heritage, and Local Government's Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)[1]:

> *1.4 The amended Directive provides a definition of EIA for the first time. It is defined as a process consisting of:*
>
> *(a) the preparation of an Environmental Impact Assessment Report (EIAR) by the developer*
>
> *(b) the carrying out of consultations*
>
> *(c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through consultations with the public, prescribed bodies and any affected Member States*
>
> *(d) the reasoned conclusion of the competent authority on the significant effects of the project on the environment, and*
>
> *(e) the integration of the competent authority's reasoned conclusion into any development consent decision.*
>
> *1.5. The definition of EIA provides for a clear distinction between the process of environmental impact assessment to be carried out by the competent authority and the preparation by the developer of an Environmental Impact Assessment Report (EIAR).*

The EIAR presented with the planning application for the Project provides the relevant environmental information to enable the competent authority, Cork County Council, to come to a reasoned conclusion in respect of the EIA Directive when determining the application.

2.2 The requirement for an EIAR

The proposed Project which comprises 9 turbines exceeds the relevant EIA threshold, as detailed in the Planning and Development Regulations, 2001 (as amended), Schedule 5, Part 2, Class 3(I), which is *"Installations for the harnessing of wind power for energy*

[1] Government of Ireland. 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts".

Given that the proposed wind farm will exceed the above threshold (i.e., more than five wind turbines), an EIA is required. Where it is determined that an EIA is required, the applicant must prepare an EIAR to accompany a planning application, as part of the EIA process, in compliance with the EIA Directive.

2.3 Purpose of the EIAR

The purpose of this EIAR is to present an assessment of the likely significant effects of the proposed Project on the environment. Annex IV (5) of the EIA Directive specifies that the EIAR should describe the likely significant effects of the project on the environment resulting from, inter alia:

> *(a) the construction and existence of the project, including, where relevant, demolition works;*
>
> *(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
>
> *(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*
>
> *(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
>
> *(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*
>
> *(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;*
>
> *(g) the technologies and the substances used.*

2.4 Approach to EIA

The EIAR documents the current condition of the environment in the vicinity of the Project (i.e., the baseline). Through specialist desk studies, field work, modelling, and analysis (as appropriate), the likely significant effects of a project on the environment during the construction, operational and decommissioning phases are identified.

The design of a project is an iterative process, taking findings from the specialist studies and analyses, to determine where mitigation measures can be applied to eliminate significant environmental effects of a project or reduce them to within acceptable limits in accordance with established standards and guidelines. As described in the EPA EIAR Guidelines (2022)[2], the design process and development of a project follows the mitigation hierarchy, which is as follows:

[2] Environmental Protection Agency. 2022, Guidelines on the information to be contained in Environmental Impact Assessment Reports.

- Avoidance – measures to avoid significant effects from the outset (i.e., through project design)
- Minimisation – measures to reduce the duration, intensity and extent of the effects, if they cannot be avoided
- Restoration – measures taken to improve ecosystems following exposure to unavoidable effects
- Offset – measures taken to compensate for any residual effects.

Environmental enhancements are not mitigation. Rather, they are additional measures that are proposed for any project above and beyond offsetting.

The application of the mitigation hierarchy in project design and development aims to reduce the residual effects of a project (i.e., those that remain following application of mitigation) so that they would be not significant.

2.5 EIA process

The general sequence of EIA follows the EPA EIAR Guidelines (2022)[2] as illustrated in **Figure 2.1**. The process is summarised as follows:

- screening – determines whether EIA is required
- scoping – determines what aspects of the environment should be considered and to what extent
- assessment of likely significant effects - which presents baseline information, assessment of effects and their significance, mitigation measures, and monitoring requirements
- preparation of an EIAR – a report of the assessment which informs the decision-maker in reaching a reasoned conclusion on the significant effects of a project on the environment.

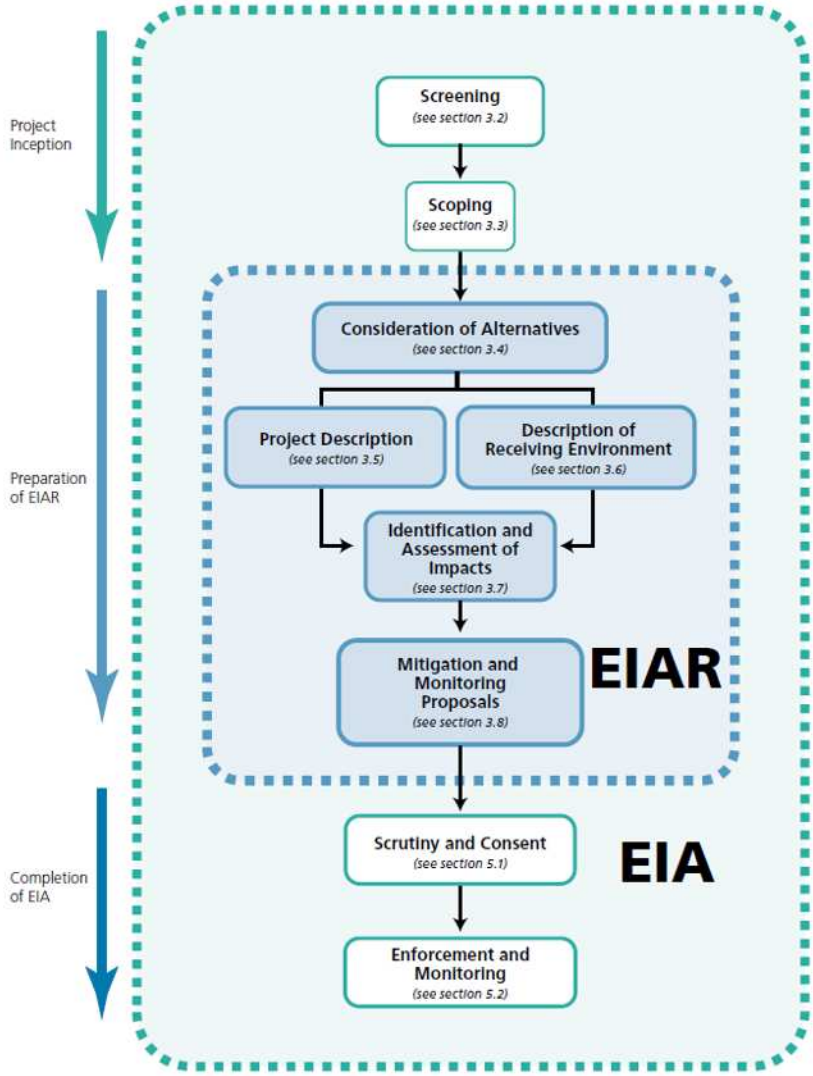


Figure 2.1: The position of the EIAR within the EIA process[2]

Source: EPA EIAR Guidelines (2022)

2.5.1 Screening

As identified in Section 2.2, the proposed Project exceeds the relevant EIA threshold, as detailed in the Planning and Development Regulations, 2001 (as amended), Schedule 5, Part 2, Class 3(I). Therefore, the Project is subject to EIA by the competent authority, and the applicant, Tullacondra Green Energy Limited, is required to prepare an EIAR to accompany a planning application.

2.5.2 Scoping

The scoping stage of the EIA is a process to determine the content and extent of the matters which should be covered in the EIAR. The EPA EIAR Guidelines[2] state:

'All parties should be aware of the need to keep the EIAR as tightly focussed as possible. This focusses the effort and resources of all parties on the key significant issues. Scoping is usually guided by the following criteria: -

- *Use 'Likely' and 'Significant' as the principal criteria for determining what should be addressed. Any issues that do not pass this test should be omitted (scoped out) from further assessment. A section of the EIAR should describe the scoping process explaining why such issues have been scoped out and they are not being considered further. All the prescribed environmental factors need to be listed in the scoping section of the EIAR. It is important to note that the environmental factors themselves cannot be scoped out and must feature in the EIAR. Only topics and headings related to each factor can be scoped in or out. Each environmental factor should be clearly covered by one or more specific section headings in the EIAR. If scoping determines that no likely significant issues arise under any heading, then an explanatory text should be included.*

- *Precedence - where EIARs for similar projects on similar sites or for other project proposals for the same site are available, these can be useful references.*

- *Interactions – careful consideration of pathways – direct and indirect – that can magnify effects through the interaction or accumulation of effects – for instance the potential for cumulative significant effects to arise from multiple non-significant impacts.*

Following informal scoping undertaken by the RSK consultant team, this EIAR identifies, describes and assesses in an appropriate manner, the direct and indirect likely significant effects that may arise during construction, operation and decommissioning of the Project on each of the environmental factors listed in Article 3 of Directive 2011/92/EU as amended by Directive 2014/52/EU as below:

Article 3

1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in points (a) to (d).

2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.

In accordance with Article 5(1) of the EU EIA Directive, the information to be provided by the developer at scoping stage shall include at least:

(a) a description of the project comprising information on the site, design, size and other relevant features of the project;

(b) a description of the likely significant effects of the project on the environment;

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

(e) a non-technical summary of the information referred to in points (a) to (d); and

(f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

A full report on the informal scoping exercise undertaken by the RSK consultant team on behalf of Tullacondra Green Energy Limited and the key issues identified from that exercise is presented in EIAR **Chapter 3 Scoping, Consultations, Community Engagement and Key Issues** of this EIAR. The Scoping Consultation Document and copies of all consultation responses received are contained in **Volume III Appendix 3.1 and 3.2**, respectively.

2.5.3 Assessment of effects

The EPA EIAR Guidelines (2022)[2] present the approach to describing environmental effects as applied to this EIAR. These are shown in **Table 2.1**. In determining significance of effects, magnitude of change is considered in relation to the sensitivity of the receiving environment (i.e., receptors).

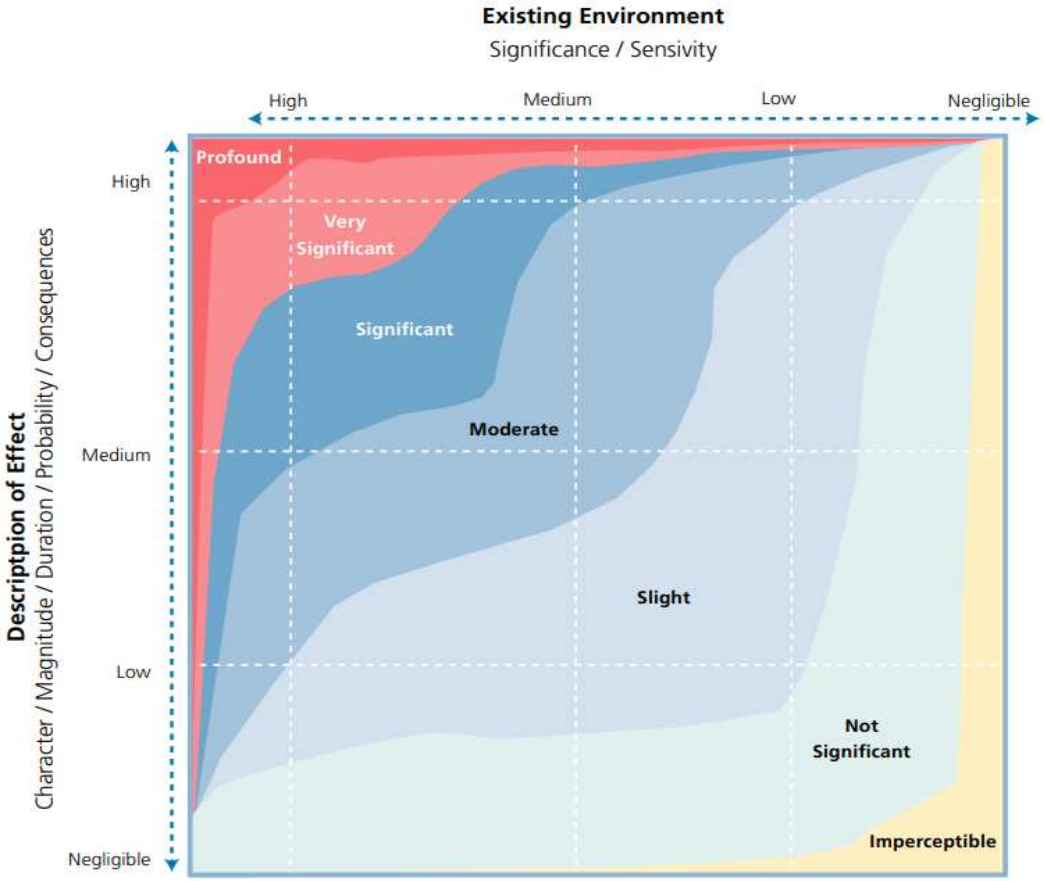
Table 2.1: Descriptions of effects

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance*).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary or Off-site Effects)** Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	'Do-nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

Source: EPA EIAR Guidelines (2022)[2]



Source: EPA EIAR Guidelines (2022)[2]

Figure 2.2: Determining significance of effects

Table 2.1 and **Figure 2.2** inform the assessment methodology that is presented in each EIAR chapter. Where relevant, the specialist contributors have further adapted the criteria specific to the factor assessed (including in the context of relevant, specific guidance). Significance matrices are then defined. The assessment methodology adopted is described within each chapter of the EIAR.

2.5.3.1 Definition of effects vs impacts

Although these terms are used interchangeably in the EPA EIAR Guidance (2022)[2] the EU EIA Directive emphasises the identification of environmental effects, with only brief mention of impacts in Article 7 and Annex III. Although related, a distinction should be made between impacts and effects. Impacts are best defined as changes resulting from an action. Effects are defined as consequences of impacts. The sensitivity of a receptor is related to potential impacts to identify the environmental effect. Criteria are then applied to determine the significance of the effect.

2.5.3.2 Transboundary effects

The site of the proposed wind farm and routes for the Grid Connection Route (GCR) options and Turbine Delivery Route (TDR) options is within the administrative boundary of Cork County Council. With respect to the TDR Option 1, the route is also within the

administrative boundary of Limerick County Council. Potential transboundary effects were not identified.

2.5.3.3 Cumulative effects and interactions of effects between different factors

Annex IV, point 5 (e) of the EU EIA Directive requires that the cumulation of effects with other existing and/or approved projects are described in the EIAR. In this EIAR, the projects considered for cumulative assessment also include proposals that are awaiting determination (i.e., there is current planning application or appeal). Throughout the process of project design and formulation, and preparation of the EIAR, the RSK Project Team has monitored projects and proposals (i.e., those not yet determined) within or proximal to the study area, including projects and proposals under various consenting procedures (i.e., local planning, strategic infrastructure, and licensing) and linear projects such as roads and railways, some of which are at early stages of development.

A desktop Geographical Information Systems (GIS) exercise was undertaken to identify projects and proposals (those not yet determined or at early stages of development) within the defined study area. The desktop GIS exercise was supplemented by in-depth research, including planning history searches, up to a cut-off date of 20th March 2024. For any planning history documentation that was not readily available for review online, the RSK consultant team attended Cork Council Offices to view the files in person.

A list of the projects and proposals that were monitored for cumulative assessment during the course of the Project design and EIAR preparation (up to the cut-off date of 20th March 2024) is presented in **Table 2.2.** The final column in **Table 2.2** summarises the scoping exercise undertaken to identify which projects were scoped in for cumulative assessment. In the table, the projects scoped in for cumulative assessment are highlighted grey.

Scope for assessment may differ depending on the environmental factor (e.g., landscape and visual impact assessment, noise impact assessment, etc.). Therefore, the projects identified for cumulative assessment, where they differ from those presented in **Table 2.2**, are defined in each environmental factor chapter of the EIAR.

Table 2.2: Existing, proposed and planned projects in the study area

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
Limestone Quarry	164477 ABP 307697	Approximately 2.7km southwest of the proposed wind farm site	Extension to existing limestone quarry and all associated site development and landscaping works at Scart, Ballyclough and Kilgilky South, Cecilstown, Mallow, Co. Cork. The proposed extension area is 5ha to the east of the existing quarry and will be accessed via existing access to the north onto the L1201-57 via the L5302-0-12 local road. The proposed development will also include a change of extraction method to blasting, crushing and screening of aggregates, upgrade of existing access road, installation of a prefabricated administration office and toilet, parking area, wheel wash, weighbridge, covered fuel storage area, entrance sign, lighting, CCTV cameras as well as a rainwater harvesting tank, and new overhead and underground power supply. This application was subject of Stage 2 Appropriate Assessment. This development was granted planning consent on appeal by Board Order dated 09/03/2022.	This operational quarry, which is identified as a source of materials for construction of the proposed Project, is scoped in for cumulative assessment for the Project due to its proximity to the proposed wind farm site.
Dublin to Cork Railway Line	ABP 310286	Approximately 13km northeast of the proposed wind farm site	The proposed development is for railway works to eliminate and, where necessary, upgrade seven numbered level crossings and carry out all associated and ancillary works along a 24km section of the Dublin to Cork Railway Line.	The seven crossings are at Fantstown, Thomastown, Ballyhay, Newtown, Ballycoskery (Ballyhea Village), Shinanagh, and Buttevant. Works on the level crossings entail transport routing over and from the N20, and at Shinanagh upgrade works are proposed for the existing junction with the N20.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			This application, which was lodged 20/05/2021, was made under the Railway Order. It is subject to EIA. This application is still under consideration by the Board.	Construction of the proposed project is projected to take place over 18 months. The proposed works at Ballycoskery, Shinanagh, and Buttevant will entail access via the N20, and in the case of Shinanagh, it will involve works on the N20 itself. This proposed development is scoped in for cumulative assessment for the Project due to its proximity to the proposed development and which relates to works along the N20, TDR Option 1.
Adventus Mining	PLA 3535 PLA 3536	The proposed Project lies within prospecting area	The Fermoy project in north Country Cork consists of twelve (12) prospecting licences covering 477km^2 and is located in the southern sector of the Irish zinc-lead-silver orefield. The prospecting licences apply to the following townlands in Orrery and Kilmore Barony: Ardskeagh, Ballinaltig, Ballyclogh, Ballycushen, Curraglass, Derryorgan, Dreenagh West, Garranenageevoge, Garryduff, Lisleagh, Poulnareagha, Scart (E.D.Kilmaclenine), Tullacondra; Ballybeg, Ballykitt, Boherascrub West, Copsetown, Croughta, Dromdowney, Dromdowney Lower, Grange East, Grange West, Kilmaclenine, Knockaunavaddreen, and Mountnorth and in Duhallow Barony, in the townlands of Ballynamona, Kilgilky North, Kilgilky South; and in Fermoy Barony the townlands of Baltydaniel East, Baltydaniel West.	The subject licences relate to lands over a wide area. The licences were granted on 20/06/2020, are valid for a period of six years, and can be renewed by application to the Minister for the Environment, Climate and Communications. According to the notice of intention to grant the subject prospecting licences, a Prospecting Licence entitles the holder to explore for mineral deposits and does not authorise mining of any minerals. The activities permissible under a licence are, in general, non-invasive and of minimal environmental impact. The Minister has assessed the exploration programme proposed by the company and has determined that the activities are not likely to have a significant effect on the environment. Where there is currently no application for mining lease or licence, no application for an integrated pollution control licence and no application for planning permission related to

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
				mining in the area, this licenced prospecting activity is scoped out for cumulative assessment in this EIAR.
Foynes to Limerick Road upgrade (including Adare bypass)	ABP 306146/ 306199	Along the Option 1 (Foynes Port) TDR. Approximately 42km north of the proposed wind farm site	Approval for Foynes to Limerick Road (including the Adare Bypass) in three road schemes including all ancillary and consequential works under sections 49 and 51 of the Roads Act 1993, as amended. The proposals include a new road from the N69 at Shannon-Foynes port to the existing N21/M20 at Patrickswell to the east of Adare via the towns of Askeaton and Rathkeale. It is 35km in length. The works are proposed at Shanagolden, Craggs, Askeaton West, Lismakeery, Nantian, Riddlestown, Rathkeale Rural, Rathkeale Urban, Dromard, Croagh, Adare North, Adare South, Clarina and Patrickswell, Co. Limerick. The proposed road scheme was granted planning consent by An Bord Pleanála on 30/08/2022.	This project is scoped in for cumulative assessment for the Project as it relates to works along TDR Option 1.
N72/N73 Mallow Relief Road	https://www.corkrdo.ie/news/n72-n73-mallow-relief-road/	Approximately 6.3km south of the proposed wind farm site	The N72 and N73 national secondary routes along with the N20 national primary route, form the strategic transport corridor around Mallow. Cork County Council are progressing this scheme within a study area that extends from the existing N72 east of Mallow to the existing N20 to the north side of Mallow. The proposed scheme incorporates a greenway to run along the former railway line adjacent to the estates in Ballyviniter and to the north	The Mallow Relief Road concluded Stage 3 of Phase 2 of the Option Selection. Public consultation on the preferred option closed 18/11/2022. The next phase (Phase 3) will see the design and environmental evaluation of the preferred option. In a recent announcement on the 2023 grant allocations to Cork County Council (February 2023), it was revealed that Transport Infrastructure Ireland have allocated a limited budget of €100,000 to progress this scheme. There are no further updates for the scheme on the project website. It is uncertain

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			of Lacknalooha, with the option of linking to the proposed Mallow-Dungarvan greenway. The Mallow Relief Road concluded Stage 3 of Phase 2 Option Selection. Public consultation on the preferred option closed 18/11/2022. The next phase (Phase 3) will see the design and environmental evaluation of the preferred option. In a recent announcement on the 2023 grant allocations to Cork County Council (February 2023), it was revealed that Transport Infrastructure Ireland have allocated a limited budget of €100,000 to progress this scheme. There are no further updates for the scheme on the project website. It is uncertain when this scheme will be submitted for planning consent.	when this scheme will be submitted for planning consent. As reported in EIAR **Chapter 3 Scoping, Consultations, Community Engagement and Key Issues** of the EIAR, the RSK Project Team and the Applicant have engaged extensively with the Cork County Roads Authority and the Roads Design Office regarding the Mallow Relief Road and other schemes currently in early stages of development in the region, especially in regard to the selection of the route for transport of turbine components, and constructability review for the grid connection. This road proposal is scoped out for cumulative assessment in this EIAR as it is not yet submitted for planning permission and there is no definitive project at this stage, and it is likely to be some time before it is taken forward.
N/M20 Upgrade Works	https://corklimerick.ie/what-next/	Approximately 5.8km northeast of the proposed wind farm site	The N/M20 upgrade scheme is being developed by Limerick City and County Council, in partnership with Cork County Council, Cork City Council, Transport Infrastructure Ireland (TII) and Department of Transport. The scheme will improve connectivity between Cork and Limerick and provide for safer and more efficient journey times. The route extends 80km from Blarney, Co. Cork to Patrickswell, Co. Limerick. The preferred route proposes new and improved divided dual carriageway within and alongside the existing N20 corridor.	The preferred transport solution for this road project has been selected following extensive public consultation by Transport Infrastructure Ireland. The design of the mainline, junctions, mobility hubs with active travel infrastructure and public transport linkages, side roads, and associated ancillary works, and environmental evaluation in Phase 3 is underway and consultations with communities and affected landowners continues. The 500m project corridor will be refined as the project progresses. This project is a priority

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			Bypasses of the towns of Mallow, Buttevant and Charleville are proposed and between 30% and 40% of the existing N20 will be used.	investment in the Government's National Development Plan 2021-2030. While it could be several years before a consent application is made, it is possible that within the 10-year lifetime of consent requested for Project, this project has a reasonable prospect of either being submitted for planning consent or commencing construction by this time. Also, both of the TDR routes examined in the EIAR will cross the proposed N/M20 corridor in certain areas, and part of the project itself is within the 10km study area for the proposed development. For these reasons, this project is scoped in for cumulative assessment in this EIAR. It is also noted that the N/M20 Project Office was engaged at scoping stage by the RSK Project Team. The preferred route for this national road proposal was considered in the project design, selection of TDR options, and preparation of the EIAR.
Ballyroe Solar Farm and related 110kV substation	204041 ABP 314431	Approximately 1.2km west of TDR Option 1 (Foynes Port) TDR. Approximately 10.8km north of the proposed wind farm site.	A 10-year planning permission for the development of a 102.76 hectare solar PV farm and 3.425 kilometre underground electricity grid connection (0.34 hectares) giving a total combined area for both the solar farm and underground grid connection of 103.1 hectares. The proposed solar farm will consist of the installation of 40 year operation and subsequent decommissioning of a series of ground mounted solar photovoltaic (PV) panels, mounted on steel support structures, together with 1 single	This consented solar farm has not yet commenced development. The consented solar farm and the substation are scoped in for cumulative assessment for Project EIAR due to its proximity to TDR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			storey ESB control room, 12 electrical transformation enclosures, underground cabling, inverters, CCTV poles and cameras, deer type security fencing, existing site entrance from the L5529 road, access tracks, hardstanding area, landscaping and biodiversity measures and all associated ancillary development works, for the purpose of generating renewable energy electricity. The proposed solar farm is located in the townlands of Ballyroe and Dromin, Ballyhea, Charleville, County Cork. The proposed underground electricity grid connection is to be installed entirely under public roads from the proposed solar farm at Ballyroe to Charleville 110kV ESB substation, which passes through the townlands of Ballyroe, Ballynadrideen, Ardnageehy, Rathnacally and Clashganniv in Ballyhea, Charleville, County Cork. A Natura Impact Statement was submitted with this application. The solar farm application was granted planning permission on 22/03/2021. The SID planning application for the 110kV substation, was approved (with conditions) by the Board on 19/02/24.	
Fiddane Solar Farm and related grid connection	175799 ABP 306915 ABP 308846	Approximately 4.4km west of TDR Option 1 (Foynes Port). Approximately 10.8km north of	Development of a 67.8-hectare Solar PV Farm. The proposed solar farm will consist of the installation of a 30 year operation and subsequent decommissioning of a series of ground mounted solar PV panels, mounted on steel support structures 2.1m in height, together with 1 single storey ESB control	From examination of the online planning file, it is understood that this project has not yet commenced. This development is scoped in for cumulative assessment in the Project EIAR due to its proximity to TDR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
		the proposed wind farm site.	room, 14 electrical transformation enclosures, underground cabling, CCTV poles and cameras, deer type security fencing, site entrance, hardstanding area, landscaping along part of the northern site boundary and other associated development works, for the purpose of generating renewable energy electricity. Fiddane, Ballyhea, Co. Cork. The grid connection application was subject to appropriate assessment. The solar farm was granted on appeal 01/03/2021. The grid connection was granted 22/07/2021.	
Solar Farm	157003 214498 225174	Approximately 2.3 km west of TDR Option 2 (Cork Port), 3.2 km south of Option 1 GCR and approximately 4.6km southeast of the proposed wind farm site.	A 5 MW solar farm comprising approximately 22,200 photovoltaic panels on ground mounted frames within a site area of 5.38 hectares, 2 no. single storey inverter/transformer stations, 1 no. single storey delivery station, security fencing, CCTV and all associated ancillary development works at Gortnagross, Mallow, Co. Cork. Was granted an extended duration of permission and modifications to the approved development. Last granted date 29/08/2022.	From examination of the online planning file, it is understood that this project was due to be operational in August 2023. This development is scoped in for cumulative assessment in the Project EIA due to its proximity to TDR (Option 2), and to the wind farm site.
Soleire Renewable SPV Limited Solar Farm	225681 ABP 317577	Approximately 11km north of the proposed windfarm site, 2km west of TDR Option 1	A 10-year planning permission for the construction of, and a 40-year operation and subsequent decommissioning of, a development consisting of a 42.6 hectare solar farm. The proposed solar farm will consist of a series of ground mounted solar	This proposed development is scoped in for cumulative assessment for the Project due to its proximity to the proposed wind farm site and TDR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			PV panels, mounted on steel support structures and in some areas of potential archaeological remains on concrete blocks/shoes, together with 28 no. electrical transformation enclosures, a temporary construction compound, use of existing farm access tracks, existing site entrance, underground cabling, inverters, CCTV poles and cameras, deer type security/boundary fencing, landscaping and biodiversity measures and all associated ancillary development works, for the purpose of generating renewable energy electricity. A Natura Impact Statement will be submitted to the Planning Authority with this application. The application was submitted on 18/07/2022 and was granted conditional permission on 19/06/2023. It is currently subject of appeal.	
Restoration works in a discontinued quarry	23294 235681	Approximately 4.5km south of the proposed wind farm site, 4.8km west of TDR Option 2	The development will consist of: (a) The restoration and infilling of the existing and future void over an area of (c. 17.2ha) of existing permitted quarry (05/7029 and ABP 13.QC.2098) using approximately 2,464,000m^3 or 4,435,200 tonnes of inert soil and stone material or stone by-product, or river dredge spoil. (b) The development will consist of the restoration of the void with either: (1) Inert soil and stone waste (imported inert greenfield and non-greenfield soils and stone, and river dredge spoil) which will result in the proposed development operating as a soil recovery facility that	These proposed developments relate to a disused quarry and are scoped in for cumulative assessment in the Project due to the proximity to the wind farm site and TDR Option 2.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			requires a waste management licence from the EPA; or, (2) Soil and stone by-product (i.e. essentially virgin soil or equivalent to virgin soil and stone) which will be notified to the EPA as an Article 27 by-product at its source of origin and transported as a by-product material to enable the Site to be restored. The Site would then operate under conditions of planning. (c) The proposed development will utilise the permitted quarry infrastructure including internal roads, site office, weighbridge, wheel wash, welfare facilities and other ancillaries to complete the works. (d) Stockpiling of topsoil removed during quarrying for future implementation of a restoration plan. (e) Construction of a soil inspection shed (approximately 120m^2 in area, 4m height) and refuelling area (hardstanding) located to the west of the existing site office (approximately 16m^2 hardstanding area. (f) Decommissioning and disposal of existing fuel tanks at an appropriately licensed offsite waste facility. (g) Associated minor works to include site access road improvements (resurfacing), upgrade of drainage infrastructure including new fuel/oil interceptor and surface drains on hardstanding. (h) Existing weighbridge and wheel wash upgrades. (i) Demolition of other buildings/structures. An EIAR and Natura Impact Statement accompanies the planning application. The development comprises an activity that may require a Waste License	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			Submitted on the 06/06/2023 with a F.I. request on 28/07/2023. A planning application relating to the same area was submitted on the 18/08/2023 for the importation of clean inert soil and stone for the raising of a former quarry site in order to improve the agricultural output and the construction of a new temporary haul road. A F.I. request was issued on 11/10/2023.	
Ballinrea Solar Farm (modification) & 110kV substation and grid connection	ABP 317706 2341837 City Council ABP 318925 234563 County Council ABP 318915 https://orsted.ie/renewable-energy-solutions/solar-energy/ballinrea-solar-farm	Within 200m of TDR Option 2	ABP 317706: Proposed development of a 110kV substation, grid connection and associated infrastructure (Electricity Development Application). The planning application was submitted to ABP on the 31/07/2023 and was granted on 08/04/2024 (with conditions). Cork City Council 2341837: Application for permission for development at a c. 44.4 ha site at Ballinvuskig, Douglas, Co. Cork consisting of modifications to the permitted solar farm (Pl. Ref. No: 19/5371, ABP Ref. PL04.305186). The proposed modifications are entirely within the boundary of the permitted development and will consist of: (I) The exclusion of the permitted 38kV substation and grid connection which comprised of a loop in to the existing 38kV overhead line on site; (II) The exclusion of the permitted battery storage unit and container unit; (III) A reduction in number of inverter/transformer stations from 12 no. permitted to 8 no. inverter/transformer stations; (IV) The provision of a ring main	The previously consented solar farm, which is currently subject of an application for permission for modifications and its associated grid connection are scoped in for cumulative assessment in the Project due to its proximity to TDR Option 2.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			unit to facilitate the connection of Ballinvuskig solar farm to a proposed 110kV substation at Ballinrea Co. Cork; (V) Assorted changes to the internal access tracks and the layout and dimensions of their permitted photovoltaic panels which will increase the solar photovoltaic footprint from c. 178,600 sq.m of ground mounted solar panels to c. 188,000 sq.m of ground mounted solar panels; and (VI) All associated site works and ancillary infrastructure. A Natura Impact Statement has been prepared in respect of the proposed development and the NIS was submitted to the Planning Authority with the application. The planning application was submitted on 16/03/2023 and subsequently refused by Cork City Council on 20/12/2023 and was appealed to ABP on the 25/01/2024. The case has not yet been determined. Cork County Council 234563: Modifications to the permitted solar farm (Pl. Ref. No.: 17/6784, ABP Ref. PL04.303013). The modifications are within the boundary of the permitted development and will consist of: i) Changes to the layout and dimensions of the permitted solar photovoltaic layout which will decrease the solar photovoltaic footprint from c. 159,100 sq.m of solar panels, to c. 145,000 sq.m of solar panels on ground mounted frames (this modification is to allow	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			for the inclusion of a proposed 110kV substation and grid connection which will be subject to a separate application); ii) Amendments to the internal track layout and the removal of the permitted battery storage unit; iii) 6 no. single storey inverter/transformer stations (reduced from 10 no. permitted inverter/transformer stations). Permission is also sought for the provision of a 33kV internal network cable (c. 3,760m underground with c. 114m of overhead line) linking the Ballinrea solar farm with the Ballinvuskig solar farm (c. 1.74km to the northwest). The proposed development includes all associated site works and ancillary infrastructure. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and the NIS will be submitted to the Planning Authority with the application. The planning application was submitted on 28/03/2023 and subsequently granted planning permission (conditional) by Cork County Council on 18/12/2023 and was appealed to ABP by a 3rd Party Appellant on the 25/01/2024. The case is not yet determined by ABP.	
Hazelbrook Housing Development	235952 ABP 301429	Approximately 8.2km southeast of the proposed windfarm site,	The construction of a strategic housing development comprising 148 no. residential units, a creche, the provision of landscaping and amenity area to include 3 no. local play	This proposed development it is scoped in for cumulative assessment for its proximity to the proposed wind farm site, TDR Option 2 and GCR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
		2km east from TDR Option 2, within 200m of GCR Option 1	areas and 3 no. neighbourhood play areas and all associated ancillary development to include the provision of improved pedestrian facilities including the installation of dropped kerbs and tactile paving, new pedestrian crossings and realignment and improvement of the spa road junction and footpaths to the west, lighting, drainage, boundary treatments and bicycle & carparking and bin storage. This is a current application is for Extension of Duration to Permission granted 20/07/2018 under Planning Ref. No. ABP Ref 301429-18 (as amended by ABP 311986-21), which was submitted to Cork County Council on the 28/09/2023 (Planning Ref. 235952). A five year planning permission was granted 20/07/2018. This current planning application for extension of duration of the previously consented and amended strategic housing development was granted on 17/01/2024.	
Clonmore Housing Development	235197 ABP 301221 166949	Approximately 8.2km southeast of the proposed windfarm site, 2km east from TDR Option 2, within 200m of GCR Option 1	1) The construction of 108 no. dwelling houses, consisting of 3 no. 4 bed detached, 2 no. 3 bed detached, 68 no. 4 bed semi-detached, 32 no. 3 bed semi-detached and 3no. 3 bed terraced houses. These houses area to be assessed through the existing completed part of the housing development; 2) A crèche of 380 sqm of single/two storey construction, also accessed from the existing completed part of the housing development,	This proposed development is scoped in for cumulative assessment for the Project due to its proximity to the proposed wind farm site, TDR Option 2 and GCR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			including 11 carparking spaces and associated works; 3) the provision of a 1.2m diameter culvert within this development. This leads to an open water course which is to be provided in lieu of the existing pipeworks along the western boundary of the site; 4) all associated site development works. This is an application for extension of duration of Permission granted under Planning Ref. No. 16/6949, ABP-301221-18 The planning application was submitted to Cork County Council on the 13/06/2023 and permission was granted on the 08/08/2023.	
Student Housing Development	235607 ABP-319192-24	Within 200m of the TDR Option 2	Permission for the construction of 24 student housing units comprising of 192 study bedrooms, and ancillary communal amenities. The proposal provides 2-storey dormer purpose-built student housing units that include living/kitchen/dining room and secure foyer with integral bin and bicycle storage, improved existing site entrance, internal roads, car parking, landscaping, lighting and all ancillary development. This application, now subject of an appeal which was lodged on 04/03/2024, is yet to be determined.	This proposed development is scoped in for cumulative assessment for the Project due to its proximity TDR Option 2.
Coom Wind Park	ABP 308885	The proposed wind farm site is 19.1km south east of the proposed wind	The proposed development will constitute the provision of the following: • The construction of up to 22 no. wind turbines with a maximum tip height of 169 metres and a maximum rotor	The proposed TDR of this development is scoped in for cumulative assessment. The West TDR of the Coom Wind Park and Option 2 TDR of the Project coincide. The accommodating works along the N20 for both

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
		farm site. A portion of the West TDR (Along the N98 Port of Cork to the junction with the N40) and along the N20 as far as Rathduff is the same as Project TDR Option 2	diameter of 138 metres and ancillary works including hardstanding areas; • Upgrade of existing site tracks and the construction of new site tracks and associated drainage infrastructure both permanent and temporary; • 3 no. on site borrow pits and associated ancillary infrastructure within the townlands of Tooreen South, Mullenaboree and Lackendarragh North; • Construction of up to 2 no. onsite electrical substations including control buildings and electrical plant and equipment, a battery energy storage facility, welfare facilities, carparking and waste water holding tanks within the townlands of Knockacullata and Lackendarragh North; • 3 no. Temporary construction site compounds and associated ancillary infrastructure including parking within the townlands of Tooreen South, Knockdoorty and Lackendarragh North; • All associated underground electrical and communications cabling within private lands connecting the wind turbines to the 2no. proposed on-site substation; • Upgrade of existing access junctions for temporary construction access from the local roads, L-1219-0 and L-1501 within the townlands of Tooreen South and Lackendarragh North;	projects (temporary removal of street furniture (lights and signage) along national primary routes. For this reason, this proposed project is scoped in for cumulative assessment in this EIAR. Refer also to EIAR **Chapter 14 Landscape and Visual**, where this "proposed" wind farm is considered in the cumulative assessment.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			• Permanent access junctions; from the local road L-1219-0 within the townland of Tooreen South, and from the local road L-1501 within the townland of Lackendarragh North. • Erection of 2no. permanent meteorological masts with a maximum height of 100 m for the measuring of metrological conditions within the townlands of Tooreen South and Knoppoge; • Temporary accommodation works at 5 no. locations to facilitate delivery of abnormal loads on the public road within the townlands of Grange West, Ballyhooly South, Glashaboy South and Castleblagh. These works will primarily relate to the cutting back of hedgerows and lowering of boundary walls and the temporary installation of hardcore including an off-site turning area; • All related site works and ancillary development including landscaping and drainage; • A 10-year planning permission and 30-year operational life from the date of commissioning of the entire wind farm. This application is subject of Stage 2 Appropriate Assessment and is accompanied by an EIAR.	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			This SID private development application, was granted permission with conditions by An Bord Pleanála on 09/11/2023.	
Ballinagree wind farm	ABP 312606	The proposed wind farm site is 20.6km southwest of the proposed wind farm site. A portion of the TDR (Port of Foynes/N69/M20/ N20) is the same as Project TDR Option 1 until the turnoff at New Twopothouse.	The proposed development will constitute the provision of the following: • Construction of 20 no. wind turbines with a blade tip height range from 179m to 185m, a hub height ranges from 102.5 to 110.5m and a rotor diameter range from 149m to 155m; • Construction of turbine foundations and crane pad hardstanding areas including associated drainage infrastructure; • Construction of new permanent site tracks and associated drainage infrastructure; • Upgrading of existing tracks and associated drainage infrastructure; • Upgrade of 2 no. existing forestry and agricultural access junctions for construction and operational access from 1) the Local Roads L2750-0/L1123-62 in the townlands of Finnanfield and Ballynagree East and 2) from the Local Road L7461-0 in the townland of Ballynagree West, Co. Cork; • Upgrade of 2no. existing forestry access junctions for temporary construction access from the Local Road L7461-17 in the townland of Knocknagappul, Co. Cork;	The TDR of the Ballinagree Wind Farm and Option 1 TDR of the proposed Project coincide from the Port of Foynes to New Twopothouse. The accommodating works along these national primary routes are the same for both projects and involve temporary removal of street furniture (lights and signage), trimming of vegetation and trees, and placement of temporary road surfaces on roundabouts along national primary routes. For this reason, this project is scoped in for cumulative assessment in this EIAR. Refer also to EIAR **Chapter 14 Landscape and Visual**, where this “proposed” wind farm is considered in the cumulative assessment.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			• Use of 1 no. existing forestry and agricultural access junction for operational access only from the Local Road L-7461-44 in the townland of Knocknagappul, Co. Cork; • Installation of new permanent watercourse and drain crossings and the reuse and upgrade of existing internal watercourse and drain crossings to include 1) the replacement of an existing stone bridge structure with a new clear span concrete bridge structure along the Local Road L-7461-0 in the townland of Ballynagree West and 2) a new clear span concrete bridge structure along a proposed new track in the townland of Carrigagulla, Co. Cork; • 3 no. on site borrow pits and associated ancillary drainage within the townlands of Carrigagulla and Knocknagappul, Co. Cork; • 2 no. Temporary construction site compounds and associated ancillary infrastructure including parking within the townlands of Ballynagree West and Carrigagulla, Co. Cork; • Use of proposed wind farm access tracks and existing forestry and agricultural tracks as permanent recreational amenity trails for community use including the installation of associated signage and information boards and; the partial reinstatement and re-purposing of	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			the proposed temporary construction compound as a permanent trail head car park and picnic area including associated landscaping within the townland of Ballynagree West; • Construction of 1 no. permanent on-site 110kV electrical substation including control buildings, electrical plant and equipment, welfare facilities, carparking, water and wastewater holding tanks, security fencing, lightening protection and telecommunications masts, security cameras, external lighting and, all associated infrastructure within the townland of Ballynagree East, Co. Cork; • Installation of medium voltage underground electrical and communication cabling connecting the wind turbines to the proposed on-site substation and associated ancillary works; • Installation of permanent high voltage 110kV underground electrical and communication cabling between the proposed on-site substation within the townland of Ballynagree East to the boundary of the existing Clashavoon substation within the townland of Aughinida, Co. Cork. The cabling will be laid primarily within the public road in the townlands of Knocknagappul, Ballynagree East, Ballynagree West, Bawnmore, Clonavrick, Derryroe,	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			Rahalisk, Kilberrihert, Caherbaroul and Aughinida, Co. Cork. Associated works including the installation of 15 no. pre-cast joint bays and communication chambers; and horizontal directional drilling under 4 no. watercourse crossings in the townlands of 1) Knocknagappul, 2) Knocknagappul and Rahalisk, 3) Rahalisk and Bawnmore and 4) Bawnmore and Clonavrick; • Tree felling to accommodate the construction and operation of the proposed development; • Erection of 2no. meteorological masts with a height of 100m above existing ground levels for the measuring of metrological conditions within the townlands of Ballynagree East and Carrigagulla, Co. Cork. A lightning rod will extend above the masts by 4 meters; • Temporary accommodation works at 6 no. locations adjacent to the public roads to facilitate delivery of turbine components to site within the townlands of Dromagh, Dromskehy, Liscahane, Tullig, Drominahilla, Finnanfield and Ballynagree East, Co. Cork. These works will primarily relate to trimming of trees and hedgerows, temporary lowering of boundary walls, temporary removal of boundary walls, temporary ground reprofiling and installation of temporary stone hard standing;	

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			• Installation of a temporary off-site staging area for turbine components within the curtilage of Drishane Castle which is a Recorded Protected Structure (00319) and National Monument (296), within the townland of Drishane More. The works will include removal of a masonry wall and installation of temporary stone hard standing area and associated access track and entrances to and from the public road R583; • All related site works and ancillary development including landscaping and drainage; • A 35-year operational life from the date of commissioning of the entire wind farm is being sought. This application is subject of Stage 2 Appropriate Assessment and is accompanied by an EIAR. This SID private development application, which was submitted to An Bord Pleanála on 28/01/2022 is listed as requiring further consideration.	
Annagh Wind Farm	217246 ABP 315652	The proposed wind farm site is 10.9km N of the proposed Project wind farm site.	The development will consist of: • Construction of 6 no. wind turbines with a blade tip height of 175m, rotor diameter of 150m and a hub height of 100m; • Construction of turbine foundations and crane pad hardstanding areas;	The proposed TDR for Annagh Wind Farm and Option 1 TDR of the Project coincide from the Port of Foynes to Charleville. The accommodating works along these national primary routes are the same for both projects involving temporary removal of street furniture (lights and signage), trimming of vegetation and trees, and placement of temporary road

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment

			• Construction of new site tracks and associated drainage infrastructure.
			• Upgrading of existing tracks and associated drainage infrastructure where necessary.
			• Upgrade of entrance onto local road L1322.
			• All associated drainage and sediment control including the installation of new watercourse or drain crossing and the re-use or upgrading of existing internal watercourse and drain crossings.
			• Construction of 1 no. permanent onsite 38kV electrical substation to ESBN specifications including:
			  ○ Control building with welfare facilities;
			  ○ Electrical infrastructure;
			  ○ Parking;
			  ○ Wastewater holding tank;
			  ○ Rainwater harvesting;
			  ○ Security fencing.
			• All associated infrastructure, services and site works.
			• 1 no temporary construction site compound and associated ancillary infrastructure including parking.
			• Tree felling to facilitate construction and operation of the proposed development.
				surfaces on roundabouts along national primary routes. For this reason, this proposed project is scoped in for cumulative assessment in this EIAR.
				
				Refer also to EIAR **Chapter 14 Landscape and Visual**, where this "proposed" wind farm is considered in the cumulative assessment.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			• Installation of medium voltage (20/33kV) and communication underground cabling between the proposed turbines and the proposed on-site substation and associated ancillary works; • Erection of 1 no. permanent meteorological mast with a height of 100m above ground level and associated access track; • Installation of medium voltage (38kV) underground cabling and associated ancillary works between the proposed on-site substation and the existing Charleville Substation within the townland of Rathnacally. The proposed grid connection will be installed primarily within the public road and will include 2 no. watercourse crossings and the installation of 8 no. pre-cast joint bays. • All associated site development works. • A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm. This application is subject of Stage 2 Appropriate Assessment and is accompanied by an EIAR. This application, now subject of an appeal which was lodged on 27/01/2023, is yet to be determined.	
Spa Glen Large Scale Residential	244243	Approximately 8.3km southeast of the proposed	Permission for LRD comprising the demolition of the existing farmhouse/buildings and the construction of	This proposed development is scoped in for cumulative assessment for the Project due to

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
Development (LRD)		windfarm site, 0.4km from GCR Option 1, 1.3km from TDR Option 2	186 no. residential units, 1 no. creche and all associated ancillary development works including the signalisation of the N72/L5331 junction to provide improved sightline visibility, amendments to part of the existing hedgerow along the N72 to improve sightline visibility, 2 no. vehicular access points, 1 no. toucan and 3 no. uncontrolled pedestrian and cycle crossing points on the L5331, footpaths, parking, drainage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines. The planning application was submitted to Cork County Council on the 14/02/2024 and is not yet determined.	its proximity to the proposed wind farm site, GCR Option 1 and TDR Option 2.
Coláiste Pobail Naomh Mhuire, Station Road Creggane, Buttevant, Co Cork	244296	Approximately 5.5km from wind farm site, 0.5km from TDR option 1, 4.5km from GCR option 2	The proposed development will comprise the construction of a new 2-storey extension to the existing school building including a 2 storey link, 7 no. general classrooms, 4 no. specialist teaching rooms, 4 no. special needs classrooms, associated ancillary facilities, together with associated site works, including car parking and set-down areas, external play areas and sensory garden, and relocation of 3 existing ballcourts. As part of the proposed development 2 no. existing temporary prefabricated buildings comprising of 6 no. classrooms will be removed off site and 1 no. prefabricated building comprising 2 no. classrooms will be retained. The site is bounded by the old barracks wall (Protected	This proposed development is scoped in for cumulative assessment for the Project due to its proximity to the proposed wind farm site, and TDR Option 1.

Project	Planning Ref. or other reference	Nearest distance to Tullacondra project	Description	Scoped in / out for cumulative assessment
			Structure RPS 00052) on its eastern side and is to be retained. The planning application was submitted to Cork County Council on the 22/02/2024 and is not yet determined.	
Cois Sruthain, Croom, Co. Limerick	247004	Approximately 50m from TDR option 1, 33km from wind farm site	Extension of permission for planning ref. 17/851: the construction of 12 No. dwellings together with all roads, footpaths, underground services, connection to an existing foul sewer additions to the existing surface water drainage network including new concrete culvert to existing stream and all boundary treatments on part of site of the previously granted planning permission ref no. 01/371. The planning application was submitted to Limerick City & County Council on the 06/03/2024 and is not yet determined.	This proposed development is scoped in for cumulative assessment for the Project due to its proximity to TDR Option 1.

Each EIAR chapter includes a cumulative assessment of the Project with other proposed projects as may be relevant to that factor depending on the potential interaction and likelihood of cumulative effects within the relevant Zone of Influence (ZoI), and in accordance with specific guidance for that factor. For example, the projects which are scoped in for cumulative assessment for the **Landscape and Visual Impact Assessment** (EIAR **Chapter 14**) differ from other EIAR chapters and are listed in Table 2.3**.**

Table 2.3: Wind farms within 20km of the proposed wind farm site

Development	Status	Distance/ Direction[1]	Number of Turbines	Tip Height
Kilberehert wind farm	Operational	9km, NW	3	125 m
Boolard wind farm	Operational	12.8km, N	2	150.5 m
Knocknatallig wind farm	Operational	13.8km, NE	6	135 m
Esk wind farm	Operational	13.8km, SW	14	136.5 m
Rathnacally wind farm	Operational	14.2km, N	2	150.5 m
Castlepook wind farm	Operational	15km, NE	14	126 m
Carrigcannon wind farm	Operational	17.1km, SW	10	100 m
Boggeragh 1 and 2	Operational	17.4km, SW	43	136.5 m
Coom wind park	Consented	19.1km, SE	22	172 m
Ballinagree wind farm	In planning	20.6km, SW	20	185 m
Annagh wind farm	In planning (appeal)	10.9km, N	6	175 m

[1] From nearest turbine of the proposed development.

EIAR **Chapter 19 Interactions and Cumulative Effects** presents a summary of the potential cumulative effects arising from the proposed Project as assessed in each EIAR chapter, and also addresses impact interactions where several different impacts may collectively give rise to additional or greater effects on environmental receptors.

2.5.4 Preparation of the EIAR

The EIAR for the Project has been prepared in accordance with the provisions of the EU EIA Directive and the amended EIA Directive; the Department's Guidelines (August 2018)[1]; the Environmental Protection Agency's Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022)[2], and EU Guidance on the preparation of the Environmental Impact Assessment Report (2017)[3]

In general terms, these guidelines set out the matters that must be addressed in an EIAR which include:

- anticipating, avoiding, and reducing significant effects
- assessing and mitigating effects
- maintaining objectivity
- ensuring clarity and quality
- providing relevant information to decision makers
- facilitating consultation.

2.5.4.1 Content of the EIAR

This EIAR is presented by environmental factor and describes the existing environment, the likely significant effects of the Project, and the proposed mitigation measures, under the chapter headings listed in **Table 2.4**.

The EIAR is presented in four volumes.

- Volume I is a Non-Technical Summary (NTS), which is a condensed and easily comprehensible version of the EIAR document. The NTS is a concise statement of the significant findings and recommended actions presented in the EIAR.
- Volume II contains the EIAR chapters tabled below presented in two parts.
    - Part 1 contains the introductory chapters of the EIAR, including background information on the Project, methodology, the alternatives considered in project design, and a description of the Project.
    - Part 2 contains the impact assessments for each environmental factor as relevant to the Project, and summary chapters including residual impacts, mitigation measures and monitoring.
- Volume III contains appendices related to each EIAR chapter.
- Volume IV contains the visualisations (A1 format).

[3] European Union. 2017. Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report, https://circabc.europa.eu/ui/group/3b48eff1-b955-423f-9086-0d85ad1c5879/library/b7451988-d869-4fee-80de-0935695f67f2/details?download=true, accessed 15/05/2024.

Table 2.4: Content of the EIAR

The EIAR
Volume I. Non-Technical Summary
Volume II. Main Report
Part 1. The Project Context and Description
01. Introduction & Background
02. EIA Methodology
03. Scoping, Consultations, Community Engagement and Key Issues
04. Project Need and Alternatives Considered
05. Project Description
Part 2. Environmental Factors
06. Population and Human Health
07. Biodiversity
08. Ornithology
09. Hydrology and Hydrogeology
10. Soils and Geology
11. Material Assets (utilities, waste, telecommunications and aviation)
12. Shadow Flicker
13. Noise and Vibration
14. Landscape and Visual
15. Archaeological, Architectural and Cultural Heritage
16. Traffic and Transport
17. Air Quality
18. Climate
19. Interactions and Cumulative Effects
20. Schedule of Mitigation Measures
Volume III. Appendices
Volume IV. Visualisations

2.6 Definitions of site area, zone of influence and study area

The site area for Project which is subject of this EIAR encompasses the wind farm and the GCR and TDR Option routes. This differs to the site area of the proposed development for which planning permission is sought. In this case, the site area refers to the wind farm site and the route of the proposed grid connection leading from the site to the boundary of Mallow 110 kV substation (Option 1) as defined by the planning red line boundary. The blue line boundary (BLB) around the proposed wind farm site encompasses lands for which Tullacondra Green Energy Limited has lease options in place. It should be highlighted that these landowners also have additional ownership interests beyond the BLB but are not optioned as part of this development.

The Zone of Influence (ZoI) determines the receiving environment for the activities associated with the proposed Project (i.e., an area that could be affected by changes as a result of Project activities). Where the likely environmental effects during all phases of the development for the Project on its own and in the cumulative assessment are local, based on professional judgement, the ZoI for the Project is 10km from the wind farm site boundary and a 200m corridor of the proposed TDR and GCR options (for those areas outside the 10km study area).

In some cases, the ZoI for the Project may differ for specific environmental factor chapters in accordance with guidance that may apply. Study area boundaries are determined on the basis of ZoI, and baseline data is gathered for the study area (which lies within the ZoI). For example, the EIAR **Chapter 13 Noise and Vibration**, defines a study area delimited by the 35 decibel (dB) contour from proposed turbine positions whilst EIAR **Chapter 14 Landscape and Visual** defines a study area of 20km from the proposed turbines for its assessments, and EIAR **Chapter 12 Shadow Flicker** defines a study area of 1.5km around each proposed turbine. The methodology section of each environmental factor chapter states its ZoI/ study area accordingly.

2.7 Sensitive receptors

A total of 157 sensitive receptors within a 2+km radius of each of the proposed turbines in the wind farm site have been identified through desktop study and field survey for assessment in the EIAR. The 2+km radius correlates to the area extent for the community engagement programme. It was considered this study area defines the maximum extent where sensitive receptors may be affected by the proposed wind farm as relates to noise and shadow flicker.

Refer to EIAR **Volume III, Appendix 2.1** for a description of the methodology employed in identifying the sensitive receptors for the EIAR. The sensitive receptors identified include occupied dwellings, unoccupied dwellings (excluding dilapidated properties), planning permission sites (validated and granted up to the cut-off date of 20th March 2024), and a school. There are no sensitive receptors within 500m, forty-six (46) within 1km, eighty-seven (87) within 1.5km, one hundred and forty-nine (149) within 2km, and eight (8) sensitive receptors just outside 2km (up to 30m). Refer to **Figure 2.3**. EIAR **Volume III, Appendix 2.2** contains the database of all sensitive receptors including their grid co-ordinate reference (Geo-directory data), the distance to the nearest turbine, and the turbine identifier.

Sensitive receptors along the TDR and GCR option routes are limited to residential and commercial properties which lie alongside the option routes. These were identified via desktop GIS studies and site visits undertaken by the RSK Project Team.

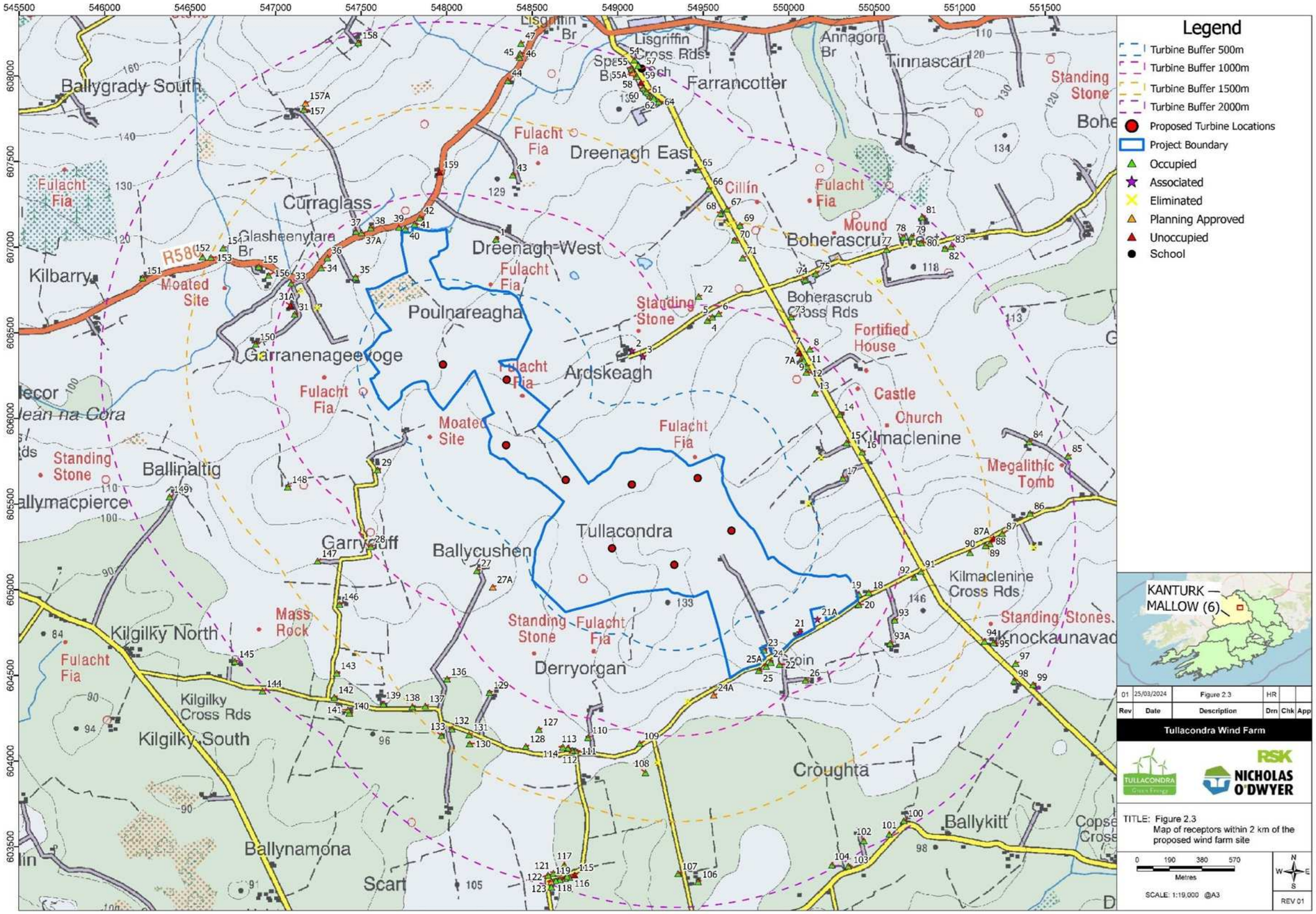


Figure 2.3: Receptors within 2km of the proposed wind farm site

2.8 Approach to Department guidance on wind energy development

The proposed Project has been designed and developed in accordance with the Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006)[4] published by the Minister per section 28 of the Planning and Development Act 2000 (as amended). The Department undertook a consultation on the Draft Revised Wind Energy Guidelines (December 2019)[5] which concluded in February 2020. To date the Department has not issued replacement Wind Energy Guidelines.

It is noted from the Climate Action Plan 2023, Annex of Actions, Action EL/23/4 related to accelerating renewables, that the Department of Housing, Local Government and Heritage intended to publish new draft Wind Energy Guidelines in Q4 2023. However, this has not transpired, as further work is being done on the draft guidelines, particularly regarding noise. The Climate Action Plan 2024 mentions no specific date for publication of new draft Wind Energy Guidelines.

In the design and EIAR for the Project, the Applicant has demonstrated compliance with the 2006 Wind Energy Guidelines. Due regard has been given to the 2019 Draft Revised Wind Energy Development Guidelines in the design and EIAR of the Project in relation to the following:

- maintaining a setback distance of four times the blade tip height of the proposed turbines (700m) to the nearest point of curtilage of non-financially involved dwellings subject to a mandatory minimum distance of 500m for all dwellings (per Section 6.18 of the 2019 Draft Revised Wind Energy Guidelines).
- undertaking community engagement, preparation of a Community Report and submission with the planning application (per Appendix 2 of the 2019 Draft Revised Wind Energy Guidelines).

It is possible that new Wind Energy Development Guidelines would be issued prior to a decision being made on the planning application for the Project. It is accepted that in the course of the statutory timeframes for decision making on the planning application under the Planning and Development Regulations, 2001 (as amended) the competent authority may request further environmental information to demonstrate compliance with any aspect of the new Guidelines.

[4] Department of the Environment, Heritage and Local Government. 2006. Planning Guidelines: Wind Energy Development, https://www.gov.ie/pdf/?file=https://assets.gov.ie/111145/93cd5b8e-e0d5-4369-8d41-45b9738a7b4d.pdf#page=null, accessed 15/05/2024.

[5] Department of Housing, Local Government and Heritage. 2019. Draft Revised Wind Energy Development Guidelines, https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/, accessed 15/05/2024.

EIAR Volume II

Main Report

Chapter 3: Scoping, Consultations, Community Engagement and Key Issues

CONTENTS

TABLES

APPENDICES (EIAR Volume III)

3 SCOPING, CONSULTATIONS, COMMUNITY ENGAGEMENT AND KEY ISSUES

3.1 Introduction

This chapter presents background information on the consultations undertaken by Tulllacondra Green Energy Limited and the RSK Project Team in EIAR scoping, pre-planning consultations, and community engagement throughout design and development of the proposed Project. The purpose of EIAR scoping and community engagement is to get valuable information on the environment and local community to aid in identifying the likely significant effects of the Project on the environment and the key issues to be considered in project design. The Planning Report, submitted in **Part 1**, **Section 8** of the planning application documentation provides further detail on the matters raised by the Cork County Council during pre-planning consultations and how they have been addressed in the proposals and the accompanying environmental information.

At an early stage and throughout the design and preparation of the EIAR for the Project, the RSK Project Team and Tullacondra Green Energy Limited's Project Management Team undertook consultations with key stakeholders listed in **Table 3.1**, either through correspondence via email and provision of the EIAR Scoping Consultation Document or through direct engagement as described herein.

Table 3.1: EIAR scoping and pre-planning consultees

List of consultees
Department of Housing, Local Government & Heritage, Development Applications Unit (DAU)
Department of Agriculture, Food & the Marine, Environmental Co-ordination Unit, Climate Change & Bioenergy Policy Division
Department of Defence, Property Management Branch
Commission for Energy Regulation
Health Service Executive, Environmental Health and Emergency Planning
Geological Survey Ireland
Office of Public Works
NM20 Project Office
Cork National Roads Office
National Transport Authority, Strategic Planning Section
Transport Infrastructure Ireland, Land Use Planning Unit
Health and Safety Authority
Inland Fisheries Ireland, Southern Region

List of consultees
Irish Wildlife Trust
BirdWatch Ireland
Irish Raptor Study Group
Bat Conservation Ireland
Southern Regional Assembly
An Taisce
The Arts Council
The Heritage Council
Fáilte Ireland
Gas Networks Ireland
Irish Water
Iarnród Éireann
ESB Networks
Irish Aviation Authority
Cork Airport
Shannon Airport
Dublin Airport
Cork County Council Planning Authority
Cork County Council Environment Section
Cork County Council Roads Authority
Cork County Council Heritage Office
Cork County Council Ecology Office
Cork County Council Archaeology Office

Note: The list above excludes telecoms operators which were contacted separately as part of the Telecommunications Impact Study prepared by Ai Bridges (refer to EIAR **Chapter 11 Material Assets**).

3.2 EIAR scoping

RSK Ireland prepared a Scoping Consultation Document providing an overview of the Project, the project scope, a description of the baseline environment, and the proposed assessment methodology and potential significant effects for each environmental factor to be addressed in the EIAR. The EIAR Scoping Consultation Document was prepared to inform a voluntary information scoping exercise that was undertaken by the RSK consultant team on the proposals in the Project.

The Scoping Consultation Document identifies key sensitive receptors, the potential pathways for effects, and the direct and indirect potential significant effects that may arise during construction, operation and decommissioning of the Project on each of the environmental factors listed in Article 3 of the EU EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) as reproduced below.

Article 3

1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in points (a) to (d).

2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.

The scoping exercise was undertaken to provide agencies and organisations with details on the Project, and to request any information they might hold that would assist the RSK Project Team in preparing the EIAR.

The agencies consulted in the scoping exercise were selected from among the statutory consultees listed in article 28 of the Planning and Development Regulations 2001 (as amended), as considered appropriate to the Project, its location, and potential impacts, as well as environmental non-governmental bodies with specified interest in the matters pertaining to the proposals (i.e., bats and birds).

The Scoping Consultation Document, along with a template of the covering letter, which was sent out to consultees in September 2022, are contained in EIAR **Volume III, Appendix 3.1**. A summary of the comments received from consultees in the scoping exercise (indicated in italics), and reports of pre-planning engagement with consultees, along with a description of where they are addressed in the EIAR, as relevant, is provided in Table 3.2. Copies of all responses received in the scoping exercise up to end of May 2023 (unless otherwise indicated) are provided in EIAR **Volume III, Appendix 3.2**.

Table 3.2: Summary of EIAR scoping and pre-planning consultation responses

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Department of Housing, Local Government & Heritage, Development Applications Unit (DAU)	Ref. G Pre00255/2022 30th September 2022, 13th January 2023, 31st January 2023	*"The Department is not in a position to make specific comment on this particular consultation at this time. No inference should be drawn from this that the Department is satisfied or otherwise with the proposed activity. The Department may submit observations/recommendations at a later stage in the process."*	n/a
Department of Agriculture, Food & the Marine, Environmental Co-ordination Unit, Climate Change & Bioenergy Policy Division	19th October 2022	Comments received in a letter attached to an email from the Environmental Co-ordination Unit from the Felling Division concerning Felling Licenses, Felling and Reforestation and Felling and EIAR.	Refer to EIAR **Chapter 7 Biodiversity** which presents detail on the habitat loss which will result from the Project. Refer to **Appendix 7.3 Habitat Management Plan** for details on habitat reinstatement and additional biodiversity enhancements.
Department of Defence, Property Management Branch	No response	n/a	n/a
Department for Energy Communications and Climate Change	28th September 2022, See response from GSI 24th October 2022	*"Our Customer Service team will review your query and forward it to the relevant Division who can provide you with a comprehensive answer.* *You should receive this response within 20 working days as stated in our Customer Service Charter. If you do not* *receive a response within this time, or if you have any further queries, please do not hesitate to contact us."*	n/a
Commission for Energy Regulation	No response	n/a	n/a

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Geological Survey of Ireland (GSI)	24th October 2022	*"Please see attached a submission on behalf of Geological Survey Ireland (a division of the Department of the Environment, Climate and Communications) for the subject entity."* The attached letter dated 20th October provides useful information and GIS resources held by GSI on the geological and hydrogeological resource of the locality with particular focus on geoheritage, groundwater, geological mapping, geotechnical database resources, geohazards, and natural resources (minerals/aggregates).	Refer to EIAR **Chapter 9 Hydrology and Hydrogeology**, and **Chapter 10 Land, Soils and Geology**
NM20 Project Office	30th September 2022	*Thank you for engaging with the N/M20 Cork to Limerick Project. Our website, https://corklimerick.ie/, contains all information required, in particular the Constraints Study Reports which may be of assistance to your EIA process. The Constraints Reports are uploaded to: https://corklimerick.ie/nm20-cork-to-limerick-constraints-reports-road-and-rail/.*	EIAR **Chapter 2 EIA Methodology** provides a description of the proposed N/M20 project and its status (Stage 3 Design and Consent Application). Refer to EIAR **Chapter 16 Traffic and Transport**
Cork National Roads Office	28th September 2022, 23rd February 2023	*"I confirm that this matter is receiving attention and our office will revert to you as soon as possible.".* Following an in-person meeting with the Cork County Council Area Roads Engineer on 27th January 2023, the consultant engineering team scheduled a site visit with the Cork National Roads Office to discuss proposals for the grid connection in the vicinity of Ballyviniter (23rd February 2023) where works are planned for a greenway and the Mallow Relief Road. Unfortunately, this meeting was cancelled. The RSK Project Engineer reached out to the National Roads Office via email on 5th May 2023, and subsequently via phone calls. Proposed design details were provided in relation to the installation of the grid connection in Ballyviniter Bridge, however, no response was received.	EIAR **Chapter 2 EIA Methodology**, Section 2.4.3 provides a description of the proposed Mallow Relief Road and its status (on hold). Refer to EIAR **Chapter 16 Traffic and Transport**

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
National Transport Authority, Strategic Planning Section	28th September 2022	*"Thank you for contacting the National Transport Authority. Your enquiry has been received and will be dealt with as soon as possible. We aim to respond to all enquiries within 15 working days. A copy of your enquiry is displayed below."*	n/a
Transport Infrastructure Ireland, Land Use Planning Unit	26th September 2022, 6th October 2022	*In response to an email to the Land Use Planning Unit of TII from the RSK engineering team on the proposed grid connection route and crossing the N20 National Primary Road. This Unit referred the engineering team to the Cork County Council Roads Authority.* *In response to EIAR Scoping Consultation request dated 6th October 2022, the reply was "Transport Infrastructure Ireland (TII) will endeavour to consider and respond to planning applications referred to it, given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines, as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012). Regard should also be had to other relevant guidance available at www.TII.ie.* *The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals, following the examination of any valid planning application referred.* *National Strategic Outcome 2 of the National Planning Framework includes the objective to maintain the strategic capacity and safety of the national roads network. In addition, Chapter 7 'Enhanced Regional Accessibility' of the National Development Plan, 2021 – 2030, sets out the key sectoral priority of maintaining Ireland's existing national road network to a robust and safe standard for users. This requirement is further reflected in the publication of the National Investment*	Refer to EIAR **Chapter 16 Traffic and Transport**

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		Framework for Transport in Ireland and also the existing Statutory Section 28 'Spatial Planning and National Roads Guidelines for Planning Authorities'. *With respect to EIAR scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network.* *The developer/scheme promoter should have regard, inter alia, to the following:* • *TII would be specifically concerned as to potential significant impacts the development would have on the existing and future national road network (and junctions with national roads) in the proximity to the proposed development.* • *Consultations should be had with the relevant local authority and/or National Roads Design Office with regard to the locations of existing and future national road schemes, especially with regard to the M20 and N72/73 Mallow Relief Road schemes.* • *In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.* *Grid connection and cable routing proposals should be developed to safeguard proposed road schemes, as TII will not be responsible for costs associated with future relocation of cable routing, where proposals are catered for in an area of a proposed national road scheme. In that regard, consideration should be given to routing options, use of existing crossings, depth of cable laying, etc.* *There is around 99,000km of roads in Ireland, the national road network which caters for strategic inter-*	

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		urban travel consists of only approx. 5.4% of this. There is a critical requirement to ensure the strategic capacity and safety of this national road network is maintained and significant Government investment already made in the national road network is safeguarded. *The provision of cabling along the national road network represents a number of significant implications for TII and road authorities, in the management and maintenance of the strategic national road network and TII is of the opinion that grid connection cable routing should reflect the foregoing provisions of official policy. Therefore, TII advises that grid connection cable routing should seek to utilise the extensive existing local road network, or alternatives, as opposed to the strategic national road network, contrary to the provisions of official policy.* *Other consents or licences may be required from the road authority for any trenching or cabling proposals crossing the national road. TII requests referral of all proposals agreed and licensed between the road authority and the applicant which affect the national road network.* *Cable routing should avoid all impacts to existing TII infrastructure such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII. Any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network.* • *The developer should have regard to any EIAR/EIS and all conditions and/or modifications imposed by An*	

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts. • *The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works).* • *It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development, with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed, as TII will not be responsible for such costs.* • *The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required for permanent works.* • *TII recommends that that applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are proposed, separate structure*	

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer, to confirm their capacity to accommodate any abnormal 'weight' load proposed. *The national road network is managed by a combination of Public Private Partnership (PPP) Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities, in association with TII.* *The applicant/developer should also consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses, to ascertain any operational requirements such as delivery timetabling, etc. and to ensure that the strategic function of the national road network is safeguarded.* *Additionally, any damage caused to the pavement on the existing national road arising from any temporary works, due to the turning movement of abnormal 'length' loads (e.g., tearing of the surface course, etc.), shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development on site.* *Designers should consult TII Publications to determine whether a Road Safety Audit is required for any of the temporary works proposed. Any recommendations should be incorporated into designs.* *Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and*	

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		development specific issues should be addressed in accordance with best practice."	
Health and Safety Authority	No response	n/a	n/a
Inland Fisheries Ireland, Southern Region	29th September 2022	*"IFI welcomes your email seeking its observations on the above matter in relation its potential impact on the inland fisheries resource. Developments such as the proposed wind farm have the potential to significantly impact on the aquatic environment if they are not carried out in an environmentally sensitive manner. IFI requests that the following be taken into consideration during your preparation of the EIA.* *The project area denoted in your accompanying map appears to lie within the sub catchments of the Awbeg river to the east, the Finnow stream to the south, and potentially with the Minor Awbeg to the west. All three are significant tributaries within the Munster Blackwater catchment, with the former also recognised as an important recreational angling resource. Furthermore the same surface waters also provide for both Brown trout and Atlantic salmon spawning/nursery habitat, also holding populations of eel and lamprey spp with the Awbeg also holding native crayfish.* *Inland Fisheries Ireland is available to further discuss any queries from you on the above, while also anticipating the opportunity to make relevant submissions in the event that the project seeks planning permission."*	Refer to EIAR **Chapter 7 Biodiversity** and **Appendix 7.2 Aquatic Ecology Report**.
Irish Wildlife Trust	No response	n/a	n/a
BirdWatch Ireland	28th September 2022	*"Thank you for your email. Please note that we receive a high volume of emails. We endeavour to respond as quickly as possible, but during busy periods please note that there may be a delay."*	n/a

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Irish Raptor Study Group	No response	n/a	n/a
Bat Conservation Ireland	3rd October 2022	*"Unfortunately, as we are a very small organisation with limited resources, we do not have the capacity to get involved in planning issues."*	n/a
Southern Regional Assembly	No response	n/a	n/a
An Taisce	28th September 2022	*"Please note that our resources are very limited and we receive a large volume of queries. As such, we are unfortunately unable to respond to every query and ask that you review these frequently asked questions.* ***If your message is a statutory referral to us per our role as a prescribed body, it will be processed as normal."***	n/a
The Arts Council	28th September 2022	*"The Arts Council / An Chomhairle Ealaíon respectfully request that the Planning Authority / Body ensures that it is properly notifying The Arts Council / An Chomhairle Ealaíon of planning applications (including receipt of further information). Reference is made to the Arts Council website containing clarification on the types of applications the Arts Council are a statutory consultee on."*	n/a
Fáilte Ireland	18th October 2022	*"Please see attached a copy of Fáilte Ireland's Guidelines for the Treatment of Tourism in an EIA, which you may find informative for the preparation of the Environmental Impact Assessment for the proposed project. The purpose of this report is to provide guidance for those conducting Environmental Impact Assessment and compiling an Environmental Impact Assessment Reports (EIAR), or those assessing EIARs, where the project involves tourism or may have an impact upon tourism. These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2."*	Refer to EIAR **Chapter 14 Landscape and Visual**

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Gas Networks Ireland	Telephone calls and emails on dates in July and October 2022	Greensource Project Manager engaged with Gas Networks Ireland (GNI) and its IPEC team on methods for crossing GNI transmission pipeline, and to confirm depth below ground level of the transmission pipeline at New Twopothouse crossing of the N20, and along and adjacent L1205 at Grange Bridge, Ballybeg."	Refer to EIAR **Chapter 4 Project Need and Alternatives Considered**, **Chapter 5 Project Description**, and **Chapter 11 Material Assets**.
Irish Water	No response.	No written correspondence was received, however RSK's engineering team accessed online GIS mapping of the Irish Water pipeline network in the vicinity of the junction of the R581 and L1207 (Shine's Cross / Kilmaclenine Corss) to determine the proposed construction solution for the grid connection at this location.	Refer to EIAR **Chapter 4 Project Need and Alternatives Considered**, **Chapter 5 Project Description**, and **Chapter 11 Material Assets**.
Iarnród Éireann	Telephone calls and emails on dates in July and October 2022	Greensource Project Manager communicated with Iarnród Éireann to discuss the proposed grid connection crossing at Grange Bridge, Ballybeg and Ballyviniter.	Refer to EIAR **Chapter 4 Project Need and Alternatives Considered**, **Chapter 5 Project Description**, and **Chapter 11 Material Assets**.
ESB Networks	28th September 2022, 18th October 2022	*"Your email has reached ESB Networks. We are currently experiencing a high volume. Our response times may take longer than expected, but we are working to answer all queries as soon as possible.* *Apologies for the delay in responding to you, we are currently working through a high volume of queries.* *I have forwarded your email for the attention of the local office in Bandon. Ref No 7006090403 -in case you need to follow up on same."*	n/a
EirGrid	19th May 2022	Tullacondra Green Energy Limited had a pre connection application meeting with EirGrid on 19th May 2022 to discuss the proposal for a connection into Mallow 110 kV substation and the requirements for grid cabling and connection into the	Refer to EIAR **Chapter 4 Project Need and Alternatives Considered**.

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		substation. Referred to ESBN on requirements for joint bays and access thereto. Following this meeting it was confirmed that there is capacity at Mallow for connection of a wind farm.	
Irish Aviation Authority	23rd May 2023	*"Thank you for your email and apologies for the delay in responding. The correspondence was forwarded to the Aerodromes Division of the IAA for review on the 15th May, as per the email chain below.* *Following the separation of the Irish Aviation Authority and Air Navigation Ireland (the IAA ANSP) from the 30th April 2023, Air Navigation Ireland is the Air Navigation Service Provider for Cork Airport.* *With DAA / Cork Airport, these entities have the primary responsibility for safeguarding in relation to Cork Airport.* *DAA / Cork Airport* *Mr. Brian Culloty,* *Head of Airside Infrastructure & Resident Engineer,* *Cork Airport.* *T:+353 21 4329749 M:+353 87 6029011* *E: brian.culloty@corkairport.com* *E: planning@daa.ie* *Air Nav Ireland:* *Mr. Cathal Mac Criostail* *Údarás Eitlíochta na hÉireann / Irish Aviation Authority* *The Times Building, 11-12 D'Olier Street, Dublin 2, D02 T449, Ireland* *cathal.maccriostail@airnav.ie* *+353 (0)1 6031173*	Refer to EIAR **Chapter 11 Material Assets**

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		+353 (0)86 0527130 *Cork Tower Business Unit* *Mr. Jonathan Byrne* *Operations Manager STBU/CTBU* *Air Traffic Control* *Irish Aviation Authority* *jonathan.byrne@airnav.ie* *+353 61 703704* *+353 87 9375486* *E: planning@airnav.ie* *Notwithstanding the review by the primary entities above, should a formal planning application be submitted, the Irish Aviation Authority will likely offer the following general observations:* *"In the event of planning consent being granted, the applicant should be conditioned to contact the Irish Aviation Authority to: (1) agree an aeronautical obstacle warning light scheme for the wind turbine development, (2) provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location and (3) notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection."*	
Cork County Council Planning Authority / Environmental Section	Pre-planning meeting 17th November 2022. Response received 25th November 2022	Planning Authority and Environment Section combined response received.	Refer to section 3.3 of this chapter for further discussion.

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Cork County Council Roads Authority	Email communication 22nd March 2023 and 6th June 2023	RSK's engineering team met on site with the County Roads Authority on site (Sr. Executive Engineer) to review options and construction solutions for the proposed grid connection and turbine delivery route on 27th July 2022. RSK's engineering team met on site with the County Roads Authority on site (Sr. Executive Engineer) to drive the proposed grid connection and to discuss the turbine delivery route on 3rd August 2022. It was flagged by the Sr. Executive Engineer at this meeting that the grid connection should be installed within the existing road network as opposed to the road verge due to the potential presence of existing drainage infrastructure and culverts. An in-person meeting with the Roads Authority (Executive Engineer) on 27th January 2023. The above meeting was followed up via email to Executive Engineer on 1st March 2023 who forwarded same to the Area Planner and provided a joint response regarding the proposed arrangements for temporary access to the Tullacondra wind farm site. Joint response provided by email dated 22nd March 2023 advised to re-examine plans for a second (temporary) entrance and justify why it is required and address biodiversity issue. The existing entrance requires clear sight lines in both directions of 3m x 80m. Surface water must not be allowed to flow onto the public road from both entrances. In response to the above, an overview of options considered for access to the wind farm site and justification for the proposed access arrangements was sent by email by the RSK Project Engineer to Executive Engineer on 24th May 2023. Feedback was received on 6th June 2023. No further roads issues were raised, and the planning advised as follows *"Following a review and a discussion with (the Senior Planner), the applicant should be advised that the access proposal should seek to minimise impacts on the hedgerows*	Refer to EIAR **Chapter 4 Project Need and Alternatives Considered**, **Chapter 5 Project Description**, **Chapter 7 Biodiversity**, **Chapter 16 Traffic and Transpo**rt, and **Appendix 5.2 Construction Traffic Management Plan** (CTMP).

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		and trees along the roadside boundary, as set out in (the Senior Planner's) email dated 14/03/23. In the event that a new entrance is considered further, this should be positioned and designed with a view to minimising impacts. A case can be made accordingly which would require a full assessment. *In addition, there are significant concerns in relation to the proposed loss of hedgerows and trees set out in the table on page 12 of the briefing document. As advised by (the Senior Planner) in his email on 14/03/23, the current County Development Plan seeks a net biodiversity gain for all proposals and this issue was raised at the initial pre-planning consultation. This issue is also raised by our Ecology section. Objective GI14-9 (e) of the County Development Plan 2022 discourages proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments. Objective BE 15-2 relates to the protection of sites, habitats and species and objective 15-2(c) seeks to protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. Also, objective 15-6 seeks to provide for the protection and enhancement of biodiversity in the development management process.* *In light of the above, the applicant should be advised to review the proposal in order to ensure that a key criterion in the layout design is to minimise impacts on the existing hedgerows and trees. The layout should integrate with the landscape setting and protect and retain the existing field pattern and minimise the impact on the historic field boundaries. The applicant is advised to refer to objective GI 14-9 of the CDP as well as the initial pre-planning advice note."*	

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Cork County Council Heritage Office	Email correspondence 16th September 2022, 6th October 2022	The RSK Project Archaeologist sent a scoping consultation request via email to the Heritage Officer in email correspondence dated 12th August 2022. In responses in September and October 2022, the Conservation Officer provided information on properties and sites on the Local Authority's Record of Protected Structures, the National Inventory of Architectural Heritage, and the Record of Monuments and Places, and states *"In certain cases a site/building can in fact feature on all three lists, the Record of Protected Structures, the Record of Monuments and Places and the National Inventory of the Architectural Heritage. However only sites/buildings within the Record of Protected Structures and the Record of Monuments and Places are afforded statutory protection under the Planning and Development Act and the National Monuments Act respectively. Sites/buildings that are included in the National Inventory of the Architectural Heritage but are not included in the Record of Protected Structure and/or the Record of Monuments and Places do not have a statutory protection, but Cork County Council does have a development management policy to protect the same from adverse impacts as part of our development management functions. Based on what you have submitted I feel you have accurately considered the parameters of the visual impact which will be the main impact in terms of architectural heritage. I would just note that many of our protected structures such as Ballygiblin House and Demesne as well as Lohort Castle to name but a few come with very extensive demesnes that are not mapped or defined on the Record of Protected Structures mapping layers but are considered to have statutory protection. I would consider this a key challenge, which will require a good understanding of the demesne, its physical parameters and its significance supported by detailed on site survey work."*	Refer to EIAR **Chapter 15 Archaeological, Architectural and Cultural Heritage** and the Archaeological and Cultural Heritage Visual Impact Assessment contained therein.

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
Cork County Council Archaeology Office	Email correspondence and phone communication on 7th July 2022, 19th July 2022, 15th September 2022, 6th October 2022, 6th April 2023, 25th April 2023, 9th August 2023,17th August 2023, 18th August 2023, 23rd August 2023, 24th August 2023, 25th August 2023, 9th October 2023 and 11th October 2023.	The RSK Project Archaeologist sent a scoping consultation request via email to the County Archaeologist on 12th August 2022 and followed up via phone and email on dates in July, September and October 2022. The Project Archaeologist engaged further with the Cork County Archaeologist via phone and follow up email dated 6th April 2023 seeking comment on the proposed outline mitigation strategy for the Project. No email response was received from the County Archaeologist. The Project Archaeologist followed up with a summary of telephone discussion in email dated 24th April 2023. Following the second pre-application meeting with the Planning Authority, the Project Archaeologist made telephone contact with the new County Archaeologist on 17th August to present the proposals and review discussions which were undertaken with the previous County Archaeologist. A Teams meeting was held with the Project Archaeologist, the County Archaeologist and Tullacondra Green Energy Limited on the 25th August 2023 to discuss appropriate embedded mitigation and buffer zones for archaeological features within and surround the site. Further enquiries were made with the County Archaeologist on a specific query related to finalising the red line boundary with a response received on 11th October 2023.	Refer to EIAR **Chapter 15 Archaeological, Architectural and Cultural Heritage**
Dublin Airport	28th April 2023	*"As the proposed wind farm is approximately 43kms (23 nautical miles) north/north-west of Cork Airport, there is no concern from an obstacle perspective and following consultation with our AirNav Colleagues (formerly IAA ANSP), an Instrument Flight Procedures (IFP) Assessment is not required.* *However, there are a number regulatory requirements that will need to be complied with such as:*	Refer to EIAR **Chapter 11 Material Assets**

Consultee	Date of Response / Communication	Response Received / Key Issues Raised	Where the responses / key issues are addressed in the EIAR
		• *Any obstacles greater than 100m AMSL elevation must be notified to airspace@iaa.ie, and* • *A Navigation Warning light will be required.* *I've also copied interested colleagues from AirNav Ireland as well as daa who may well wish to provide further feedback."*	

3.3 Pre-planning consultations

3.3.1 Pre-planning consultation 1

A pre-planning meeting was held online with Cork County Council on Thursday 17th November 2022 (Ref. PPN 22/687). The meeting was attended by officers of Cork County Council Planning Authority and the Environmental Section. In attendance from the applicant were members of the Project Management Team of Tullacondra Green Energy Limited. Also in attendance were the RSK Ireland consultant team including an engineer, planners and specialist environmental consultants involved in project design and preparation of the EIAR.

The prospective Applicant and consultant team made a presentation which included background information on the applicant company; a brief overview of the proposal and information on the progress of baseline studies and surveys; the constraints and opportunities posed by the site location and characteristics in relation to project design, the constraints led approach to design; the community engagement programme and community benefits; and questions relating to planning policy and technical standards applicable to the proposed development.

The officers of the Council's Planning Authority and Environmental Section made a presentation and addressed the principle of development at this location, which is an area designated as 'Open to Consideration' in the County Development Plan (CDP) 2022 – 2028; and provided information and feedback on aspects to be addressed in the EIAR and planning application related to water quality, noise, archaeology, landscape, biodiversity, and residential amenity.

The Planning Authority followed up via email (dated 25th November 2022) to provide notes from the pre-planning meeting and a copy of the presentation made by the Planning Authority. The notes are summarised as follows:

<u>Principle</u>

- Will be considered and assessed under the CDP and relevant national guidelines.
- Section 13.6 of CDP is relevant regarding Wind Energy. The Council are supportive of wind energy development at appropriate locations. Note Objective ET 13-4.
- The CDP Wind Energy Strategy identifies three categories of 'Wind Deployment Area' for large scale commercial wind energy developments - Acceptable in Principle, Open to Consideration and Normally Discouraged. Note Objective ET 13-5.
- Subject site is within an 'Open to Consideration' area. Note Objective ET 13-7.
- Section 13.7 of the CDP sets out criteria to be covered by the applicants.

<u>General Comments</u>

The Council's Environmental Section provided broad comments as follows:

- The site is located on generally free draining highly productive farmlands with gentle slopes.

- There are no open watercourses shown on site.
- With good management the risk to water quality from the proposed development should be low. Risks to water quality are posed by groundworks, dewatering of excavations, run-off from access roads, hydrocarbon spillages, concrete works, etc.
- The applicant should address all risks to surface and groundwater in the application and identify remediation measures and a water quality monitoring programme during and post development.
- From the maps submitted it appears that most of the site is contained in the Lisduggan North_10 waterbody and the Blackwater Munster_90 waterbody. These waterbodies make up one of the 6 pilot catchments in the Waters of Life Integrated Project.[1] The applicant should be cognisant of this when preparing their application.

In relation to noise, the Environmental Section provided these broad points:

- Environment impact assessment should fully assess the impact of the proposed development on the receiving environment and sensitive receptors during both the construction and operational phases.
- All claims for methods of mitigation must be sufficiently detailed to allow audit of the claims.
- Any calculations along with details of any assumptions should be included as well as full descriptive details of all monitoring locations used.
- **No liability can be accepted for any omission in the information submitted regardless of any advice given and a full assessment of the application can only be carried out when it is submitted to the Planning Authority for approval.*

Other issues raised include:

- Archaeology: applicant should note Objective HE 16-9 of the CDP.
- Landscape: applicant should be cognisant of views from Scenic routes when assessing visual impact. Objective GI 14-13 and GI 14-9 refers.
- Ecology: It was noted that there will be impacts on local biodiversity such as hedgerows, particularly at construction stage. However, the principle of biodiversity gain should be addressed within the application – note Objectives BE 15-2 and BE 15-6.
- Residential amenity: it was noted that this is a working landscape with a high level of one-off housing. The proposal should avoid adverse impacts on residential amenity particularly in respect of noise, shadow flicker and visual impact. Note Objective ET 13-7.

Please note all pre-planning comments are an expression of informal officer opinion only made without prejudice to the determination of any formal planning application by the Planning Authority. As per Section 247 of the Planning and Development Act, 2000 (as amended) all pre-planning consultation and information provided shall not prejudice the

[1] Waters of Life EU Integrated Project website, https://www.watersoflife.ie/, accessed 07/06/2023.

performance of the Planning Authority of any other of its functions under the Planning and Development Act 2000, (as amended) or any regulations made under this Act and cannot be relied upon in the formal planning process or in legal proceedings.

This information was circulated to the RSK Project Team for their consideration in preparing the EIAR. RSK's planning team responded to the Planning Authority's email in reply dated 28th November 2022 and provided a copy of the presentation they made at the pre-planning meeting.

3.3.2 Subsequent pre-planning consultations

A second pre-planning meeting was held on 2nd August 2023. In attendance from the applicant were members of the consultant team including town planners, the project ecologist and engineer, and members of the Tullacondra Green Energy Limited project team. In attendance from Cork County Council were planning officers, the county ecologist, and engineer.

A third and final pre-application meeting (in person) was held with the Planning Authority on the 11th September 2023. Attendees representing the applicant included the Tullacondra Green Energy Limited project team and the consultant engineer. The focus of this discussion was on project design and the avoidance of hedgerow loss.

At both of these pre-planning meetings, Tullacondra Green Energy Limited presented a progress update on the preparation of the EIAR, project design and planning application. In the second pre-application meeting, there was a particular focus was on plans for access to the proposed wind farm site, biodiversity net gain, and validation requirements. Findings from environmental baseline surveys undertaken by the RSK consultant team informed recommendations on construction solutions and mitigation measures to arrive at an optimal project design that meets the design objectives and responds to the constraints posed by the characteristics of the site, its location and the type of development.

A copy of the presentation given by the applicant at the second pre-application meeting was provided to the Planning Authority in a follow up communication dated 8th August 2023. Prior to the third pre-application meeting, the applicant provided a set of figures to illustrate how the project design had been amended following concerns related to hedgerow loss raised by the Planning Authority in the second pre-application meeting.

The Planning Authority's notes from the second and third (final) pre-application meeting were obtained on 5th October 2023. The main points of discussion at these meetings were:

- While the entrance was the initial focus of the query, the overall approach to biodiversity is key. Principle of biodiversity gain should be achieved.
- The layout indicated a high degree of hedgerow/tree loss. The high biodiversity value of hedgerows was highlighted, which can take over 30 years to mature.
- Hedgerow loss is avoidable in places e.g. through the use of punch holes through hedgerow for access purposes only.

- Hedgerows and the historic field pattern are part of our heritage. These are extremely important heritage features with archaeological significance. They can form part of townland demarcation also.
- The layout can be amended and revised.
- Local Authority ecologist advised of concerns re: compaction of ground due to proximity to hedgerows/treelines and resultant impacts overtime – avoid same.
- Clear maps and accurate figures were requested
- These comments should be taken in conjunction with the previous note.
- Revisions to the layout were made to avoid hedgerow removal and this was presented to Planning staff. The amendments were broadly very positive and well presented. Any application should include this approach and should clearly justify and explain options considered where hedgerow encroachment is deemed necessary.

3.4 Community engagement

Tullacondra Green Energy Limited has undertaken a programme of community engagement and held a public consultation event for the Project. The aim of the community engagement programme is to ensure that the views, concerns, and feedback received from the local community were considered as part of the project design and EIA process. Community engagement will continue beyond submission of the planning application for the Project.

The community engagement programme for the Project has taken the Department of Housing, Planning and Local Government's Draft Revised Wind Energy Guidelines (December 2019)[2] into consideration. These Draft Guidelines provide guidance for enhanced community engagement for wind energy development proposals, requiring developers to undertake community engagement and prepare and submit a community report with the planning application. Appendix 2 of the Draft Guidelines provides a road map to assist with identification of the appropriate geographical area, the stakeholders, and the methods of communication for the community engagement programme throughout the design and development, construction and operation of the Project.

3.4.1 Community Engagement Report

A report of the activities, events and follow up actions undertaken during the community engagement programme for the Project which is ongoing is provided in the Community Engagement Report contained in **Volume III, Appendix 3.3** of the EIAR.

3.4.2 Community Liaison Officer

The appointed Community Liaison Officer (CLO) for Tullacondra Green Energy Limited. has led the community engagement programme for the Project. This work has included:

[2] Department of Housing, Local Government and Heritage. 2019. Draft Revised Wind Energy Development Guidelines, https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/, accessed 15/05/2024.

- the preparation and regular update of the project website www.tullacondragreenenergy.ie;
- preparation and execution of mail drops and door to door visits; and
- arranging a public exhibition which was delivered with support from the RSK Project Team.

The CLO is responsible for ensuring that all queries raised during the community engagement process are logged to the Community Feedback Tracker and for providing responses in a timely manner.

3.4.3 Timeline of community engagement activities

Table 3.3 provides a timeline and description of the community engagement activities undertaken by Tullacondra Green Energy Limited about the Project to date.

Table 3.3. Timeline and description of community engagement activities

Date	Description of Activity	Detail
17th November 2022	Pre-planning meeting with Cork County Council	Refer to section 3.3 of this chapter
28th November 2022	Project website launch www.tullacondragreenenergy.ie	The Project website contains information on the location and size of the proposed Project, construction and access, wind farm design and the proposed community benefit fund. The website also provides contact details and a feedback form. It is updated regularly with the latest project information.
4th January 2023	Engagement with TDs and Cork County Council elected members regarding the proposed Project	Personal communication by phone call
5th January 2023	Google digital marketing campaign launched	Refer to EIAR **Volume III, Appendix 3.3**
5th January 2023	Press release and advertisement in The Corkman	Refer to EIAR **Volume III, Appendix 3.3**
6th January 2023	Letter and brochure delivered via An Post to each household within 2km radius of the proposed Project	Refer to EIAR **Volume III, Appendix 3.3**
23rd - 25th January	Door to door visits to households within 1km of the proposed Project. Engaged directly with twenty residents and left a note and leaflet with twenty-two residents. Information packs were left at residences where there was no one in.	Refer to EIAR **Volume III, Appendix 3.3**
January – February 2023	The CLO held in-person meetings with residents who requested them at the Public Exhibition. Communication with	

Date	Description of Activity	Detail
	residents via phone calls and email was ongoing in this period.	
30th January 2023	Invitation to the Public Exhibition were sent to households within 1km and 2km of the Project.	Refer to EIAR **Volume III, Appendix 3.3**
31st January 2023	Advertisement on the Public Exhibition appeared in The Corkman on 2nd February 2023.	Refer to EIAR **Volume III, Appendix 3.3**
31st January 2023	Invite to eleven elected representatives (TDs and Cork County Council elected members) via email.	Refer to EIAR **Volume III, Appendix 3.3**
31st January 2023	Project website updated with Public Exhibition invitation and details.	Refer to EIAR **Volume III, Appendix 3.3**
8th February 2023	Public Exhibition in Springfort Hall, Mallow. Seventy-four people attended.	Refer to EIAR **Volume III, Appendix 3.3**
9th February 2023	Project website was updated with visual displays from the Public Exhibition.	Refer to EIAR **Volume III, Appendix 3.3**
28th March 2023	Meeting with local Gun Club	In person meeting between Tullacondra Green Energy Limited Project Manager and members of the local Gun Club
28th March 2023	Wind Farm Tour Invitation to interested parties (those who signed up as interested at the exhibition event).	Refer to EIAR **Volume III, Appendix 3.3**
12th May 2023	Wind Farm Tour at Greensource's Kilmeedy operational wind farm.	Refer to EIAR **Volume III, Appendix 3.3**
Ongoing	Public consultation continues via email and phone contact with residents and 1-1 meetings with the Community Team on request. Regular updates are also posted on the project website.	Refer to EIAR **Volume III, Appendix 3.3**

3.4.4 Project website

A project website (www.tullacondragreenenergy.ie) has been created to share information with the local community. Information presented on the project website provides information on the following:

- The applicant, Tullacondra Green Energy Limited
- Main findings and progress of the EIAR
- Project details and maps
- Relevant publications
- Information on climate change

- Information from the Public Exhibition
- Contact information for Tullacondra Green Energy Limited

All queries received via the contact details provided on the website are responded to by the CLO in a timely manner.

3.4.5 Public exhibition

Tullacondra Green Energy Limited hosted a Public Exhibition of the Project proposals in Springfort Hall Hotel, New Twopothouse, Co. Cork on 8th February 2023. The purpose of this event was to present the Project to local residents and the general public and to provide an opportunity to engage with the relevant expert to answer any queries or concerns they had with regard to the proposals.

Attendees were greeted on entry to the event and guided through the visual displays with maps and other material. Experts from the RSK consultant team and from Tullacondra Green Energy Limited project management team were in attendance to answer questions and explain the information on display. Attendees were encouraged to provide feedback on the comment forms provided.

Advance engagement including advertisement and publicity in the local newspaper and project website, and invitations to residents (as summarised in **Table 3.3**) ensured a good attendance at the event. Over one hundred and eighty invitations to the Public Exhibition were sent to those residing in an area extending to 2km from the location of the proposed wind farm site. Invitations were sent via email to eleven elected representatives (TDs and County Councillors).

The Public Exhibition was attended by seventy-four people, including two County Councillors. Twenty feedback forms were completed.

3.4.6 Key issues raised

Key issues raised in the community engagement programme were captured through telephone and email correspondence and website and hardcopy feedback forms. These issues were addressed where possible in the design and development of the Project. Refer to EIAR **Appendix 3.3** Community Report for details of key issued raised.

3.4.7 Planned future engagements

3.4.7.1 Planning application

Tullacondra Green Energy Limited will continue its programme of community engagement up to the time of submission of the planning application. For any enquiries or submissions in relation to the Project proposals received by the CLO during the statutory consultation period, the person with the query or submission will be directed to the Cork County Planning Authority. Periodic updates on the progress of the planning application will be provided on the project website.

3.4.7.2 Construction phase

Upon a grant of planning permission, Tullacondra Green Energy Limited will engage further with the community as it prepares for construction of the Project. The Construction Environmental Management Plan (CEMP) included in **Volume III, Appendix 5.1** of EIAR **Chapter 5 Project Description** addresses measures to minimise noise, dust and air pollution arising from construction activities on the wind farm site and public roads. The Construction Traffic Management Plan (CTMP) included in **Volume III, Appendix 5.2** addresses traffic control measures for the delivery of turbine components, management of traffic diversions required for works on the grid connection route and accommodating works for the turbine delivery route. The CEMP and the CTMP provide the basis for the final construction phase CEMP and CTMP which will be prepared by the appointed contractor in advance of commencement of development.

These documents, which will be submitted to the Planning Authority for review and approval, will be the key reference documents for engagement during the 18-month construction stage. The CLO's particular emphasis during the construction stage will be in communicating with the public and the relevant authorities in advance of construction activities to ensure the impact of works on local road users and residents is minimised.

The CLO will ensure that advance notice is given to all households for any likely disruption to traffic during the construction stage, through direct communication and via periodic updates to the project website. The CLO will be available to the community to address and deal with all enquiries and concerns.

3.4.7.3 Operation Phase

Throughout the project's 35-year operation it will be the appointed CLO's responsibility to directly address and investigate issues that are raised by local residents. Annual meetings between the wind farm operator and the community will be scheduled to provide updates on project performance and to address any issues raised. The project website will be maintained to provide relevant and up to date information.

3.4.7.4 Decommissioning Phase

In the 12 months preceding the commencement of decommissioning the wind farm, the wind farm operator and the appointed CLO will engage with all residents within 2km of the Project to outline the decommissioning plan and address any issues raised. As with other stages, the project website will be updated to provide relevant information to the local community.

EIAR Volume II

Main Report

Chapter 4: Project Need and Alternatives Considered

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4 PROJECT NEED AND ALTERNATIVES CONSIDERED

4.1 Introduction

This chapter sets out the need for the Project, which is driven by international, European and national policy on sustainable development and climate change. It also describes the reasonable alternatives studied by the developer for different project elements, as relevant to the proposed project type, its location, and the characteristics of the receiving environment.

The Project includes the construction, operation and decommissioning of a wind energy development consisting of nine wind turbine generators with foundations and crane pad hardstanding areas; a permanent meteorological mast; an on-site 38kV substation, underground cabling connecting the turbines to the on-site substation; and underground grid connection to the Mallow 110 kV substation boundary; along with all associated site works including site clearance, temporary compounds and storage areas; a new temporary entrance and upgrade of an existing entrance; upgrade of existing site tracks and construction of new site tracks; site drainage; and ancillary developments including security gates and fencing, lighting and signage; and biodiversity mitigations and enhancements.

The site layout plan of the proposed wind farm is shown in **Figure 1.4**, in EIAR **Chapter 1 Introduction**. Further details of the Project, the construction programme and sequencing of works which are used as the basis for assessments in this EIAR are provided in **Chapter 5 Project Description**.

4.2 Project Need

The Project is proposed in response to international, European and national policy on climate change and targets to increase the share of renewables for electricity generation and reducing carbon emissions. Ireland's participation in international action on climate change, which seeks to limit global temperature rise to 1.5 degrees Celsius above pre-industrial levels, is confirmed in the country's ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994, with formal ratification of the Kyoto Protocol in May 2002[1], followed by the Paris Agreement in December 2015[2].

Ireland's national energy and climate policy is derived from overarching European policy aimed at unifying the European Union in energy and climate goals. The European Green Deal (2019)[3] sets EU-wide targets and policy objectives for the period between 2020 and

[1] Council Decision 2002/358/EC of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder.

[2] UNFCCC. 2015. Paris Climate Change Conference - November 2015.

[3] European Commission. 2019. The European Green Deal.

2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet net-zero greenhouse gas emissions by 2050.

Ireland's National Planning Framework (2020)[4] has a main objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. Arising from the EU Green Deal[3], the Climate Action and Low Carbon Development (Amendment) Act 2021 sets Ireland on a legally binding path to net-zero emissions no later than 2050, and to a 51% reduction in greenhouse gas emissions (over 2018 levels) by 2030.

The route to achieve these targets is set out in the government's Climate Action Plan 2024)[5] which seeks to meet 80% of electricity demand by renewables by 2030. That target will be achieved by increasing the installed capacity of onshore wind to 6 GW by 2025, reaching 9 GW by 2030. Cork County Council Climate Action Plan 2024-2029[6] (as discussed in section 4.3.7) strengthens the links between national and international climate policy and the delivery of effective climate action at a local and community level, through 'Place-based' climate action.

4.2.1 Renewable energy targets

In the context of increasing energy demand and prices, uncertainty in energy supply and the effects of climate change, our ability to harness renewable energy such as wind power plays a critical role in creating a sustainable future. Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. The development of additional indigenous wind energy generating capacity will not only help to reduce carbon emissions but will also improve Ireland's security of energy supply.

Looking beyond 2030, Ireland will have to meet even more demanding climate change and renewable energy supply obligations in order to play its part in achieving the European climate and energy ambitions. The emerging Climate Action Plan 2024[5] estimates that Ireland will require accelerated deployment of renewable energy to 2.3 GW annually between 2024 and 2030.

4.2.2 Reduction of carbon emissions

This production of renewable energy will assist in achieving the Government's and EU's stated goals of ensuring safe and secure energy supplies, promoting an energy future that is sustainable and competitively priced to consumers whilst combating energy price volatility and the effects of climate change. The Climate Action Plan 2024 (2024)[5] aims to keep Ireland's emissions within its mandatory carbon budget and achieve the legally binding target of reducing emissions by 51% (from a 2018 baseline) by 2030.

[4] Government of Ireland. 2020. Project Ireland 2040 National Planning Framework.

[5] Government of Ireland. 2024. Climate Action Plan 2024.

[6] Cork County Council. 2024. Cork County Council. Climate Action Plan 2024 – 2029.

4.2.3 Economic benefits

For its 2023 Annual Report[7], Wind Energy Ireland (WEI) produced headline statistics that demonstrate the benefit of wind power generation to the Irish economy. During 2023, wind farms produced 35% of the Island's electricity. The WEI commissioned a study by Baringa[8], which found that without wind energy, Ireland would have had to spend an additional €918 million on gas, most of which would have been imported, for power generation in 2023, and an extra €358 million on carbon credits to burn that gas. The Baringa analysis also estimate that Irish wind farms saved approximately 4.2 million tonnes of carbon last year which is roughly equivalent to the amount of carbon produced by 1.9 million cars.

A recent study by KPMG for Wind Energy Ireland[9] examines the income generation and job creation potential of onshore wind in meeting the 2023 Climate Action Plan target of 8,200 MW of onshore wind by 2030. In this study, it is estimated that (excluding employment related to grid transmission works), by 2030 total direct and indirect employment in Ireland could rise by 35% to 7,200, with most of these jobs benefiting rural areas (i.e., where onshore wind projects are located). The KPMG study goes further to state that "*Meeting the target of ~8,200 MW by 2030 will require a sustained annual investment of ~400 MW annually. The number of cumulative construction job years for capital expenditure (capex) could grow from 800 in 2020 to 8,800 by 2030. This is likely a conservative figure, as it does not include a share of jobs in grid development, the systems operators, or regulators*."

While macroeconomic studies look at job creation potential on a wider scale, it is important to note that, where there is a drive to produce more of our energy from renewable sources, the real benefit lies in maintaining the jobs for skilled workers engaged in renewable energy for the regions of Ireland. According to the WEI publication titled "Powering Cork"[10], "*an enormous opportunity now exists for a whole new industrial sector to emerge in Cork"*. There is potential for the proposed Project to make a substantial contribution to creating jobs, supporting the rural community and investing in the Cork economy over the lifetime of the Project.

4.3 Policy context

National energy and climate policy is derived from the overarching European Policy which aims to unify the European Union in energy and climate goals. The following section sets out the relevant national policies which will influence the development of the country in the coming decades with respect to energy production, carbon neutrality and climate change mitigation.

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[7] Wind Energy Ireland. January 2024. Annual Report. https://windenergyireland.com/latest-news/7651-new-record-set-for-wind-power-generation-in-2023, accessed on 15/05/2024.

[8] Baringa and Wind Energy Ireland. January 2024. Cutting Carbon, Cutting Bills, Analysis of savings in gas consumption deliver by wind farms in 2023. https://windenergyireland.com/images/files/final-baringa-wind-energy-ireland-cutting-carbon-cutting-bills-2023.pdf, accessed on 15/05/2024.

[9] KPMG, Economic Impact of Onshore Wind in Ireland, April 2021, Economic impact of onshore wind in Ireland (windenergyireland.com), accessed 24/04/2024.

[10] IWEA, Powering Cork, September 2022, https://windenergyireland.com/images/Article_files/PoweringCork-DigitalVersion-SinglePage.pdf, accessed 02/06/2023.

These policies are supported by the latest Programme for Government (2020)[11] 'Our Shared Future' which presents strong climate governance in rapidly reducing climate to protect and improve public health and quality of life. The government are committed to rapid decarbonisation of the energy sector with an aim of providing the necessary actions to deliver national renewable electricity targets. These government ambitions support the ongoing generation of renewable energy from onshore wind sources, as detailed below.

4.3.1 Climate Action Plan 2024

The Climate Action Plan 2024[5] (CAP24) was approved by the Irish Government in December 2023, subject to Strategic Environmental Assessment and Appropriate Assessment. Public consultation on CAP24 will commence in early 2024. CAP24 is the second statutory update to the CAP since the Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law, committing Ireland to 2030 and 2050 targets for reducing greenhouse gas (GHG) emissions. It builds on CAP23 and outlines how Ireland will accelerate the action required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

CAP24 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy wide carbon budgets and sectoral emission ceilings that were agreed by the Government in July 2022.

In relation to electricity, CAP24 sets a Key Performance Indicator (KPI) by 2025 to achieve 50% renewable electricity share of demand, with an ambitious target to develop 6GW onshore wind capacity and up to 5GW solar PV capacity including at least 1GW of non-new grid solar. In relation to Key Messages for Electricity, CAP24 states the following:

> *"The electricity sector continues to face an immense challenge in meeting its requirements under the sectoral emissions ceiling, as the decarbonisation of other sectors, including transport, heating, and industry, relies to a significant degree on electrification. The deployment rates of renewable energy and grid infrastructure required to meet the carbon budget programme for electricity is unprecedented and requires urgent action across all sectors to align with the national targets" (i.e.* 6GW and 9GW of onshore wind by 2025 and 2030, respectively).

CAP24 Section 12.1.3 Electricity: The Scale of the Challenge highlights that:

> *"For onshore renewables, greater alignment between national, regional and local plans and renewable energy targets to support investment in, and delivery of, onshore wind and solar renewable energy is also critical in this context".*

4.3.2 Project Ireland 2040: The National Planning Framework 2018

The National Planning Framework (NPF) is the Irish Government's high-level strategic plan for shaping the future growth and development of Ireland to the year 2040. The Irish Government has committed that 80% of all electricity will be generated from renewable sources by 2030 including 9GW from onshore wind, that carbon emissions will be reduced by 51% by 2030, and that the country will achieve net zero emissions by 2050.

[11] Department of the Taoiseach. 2020. Programme for Government: Our Shared Future.

"The National Planning Framework is a planning framework to guide development and investment over the coming years. It does not provide every detail for every part of the country; rather it empowers each region to lead in the planning and development of their communities, containing a set of national objectives and key principles from which more detailed and refined plans will follow".

The NPF sets out the key goals and objectives for the State, and central to this framework is the theme of Realising Our Sustainable Future. In particular, Section 9.2 of the Framework titled 'Resource Efficiency and Transition to a Low Carbon Economy' states the following:

"Our transition to a low carbon energy future requires:

- *A shift from predominantly fossil fuels to predominantly renewable energy sources;*
- *Increasing efficiency and upgrading to appliances, buildings and systems;*
- *Decisions around development and deployment of new technologies relating to areas such as wind, smart grids, electric vehicles, buildings, ocean energy and bio energy; and*
- *Legal and regulatory frameworks to meet demands and challenges in transitioning to a low carbon economy".*

The NPF is supported by a series of National Strategic Outcomes (NSOs) which the Framework seeks to deliver. The purpose of the NSOs is to create a single vision, through a shared set of goals for every community across the country. The most pertinent outcomes in the context of the proposed renewable energy development are as follows:

- **National Strategic Outcome 3:** Strengthened Rural Economies and Communities
- **National Strategic Outcome 6:** A Strong Economy Supported by Enterprise, Innovation and Skills
- **National Strategic Outcome 8:** Transition to Sustainable Energy

A series of National Policy Objectives (NPOs) were developed to set the context for regional and local planning policy in Ireland. In the context of the Project the following NPOs set out in **Table 4.1** are considered the most relevant.

Table 4.1: Relevant national policy objectives

Policy Objective	Description
National Policy Objective 15	Support the sustainable development of rural areas by encouraging growth and arresting decline in areas that have experienced low population growth or decline in recent decades and by managing the growth of areas that are under strong urban influence to avoid over-development, while sustaining vibrant rural communities.

Policy Objective	Description
National Policy Objective 21	Enhance the competitiveness of rural areas by supporting innovation in rural economic development and enterprise through the diversification of the rural economy into new sectors and services, including ICT based industries and those addressing climate change and sustainability.
National Policy Objective 23	Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism.
National Policy Objective 52	The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital.
National Policy Objective 54	Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions reductions.
National Policy Objective 55	Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050.

The National Climate Policy Position establishes the national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050.

This objective will shape investment choices over the coming decades in line with the National Mitigation Plan and the National Adaptation Framework. New energy systems and transmission grids will be necessary for a more distributed, renewables-focused energy generation system, harnessing both the considerable on-shore and off-shore potential from energy sources such as wind, wave and solar and connecting the richest sources of that energy to the major sources of demand."

With regard to planning and investment for rural locations, Section 5.4: Planning and Investment to Support Rural Job Creation, recognises the key role of energy production in assisting in the rejuvenation of rural towns and villages to create and sustain vibrant rural communities.

> *"Rural areas have significantly contributed to the energy needs of the country and will continue to do so, having a strong role to play in securing a sustainable renewable energy supply. In planning Ireland's future energy landscape and in transitioning to a low carbon economy, the ability to diversify and adapt to new energy technologies is essential. Innovative and novel renewable energy solutions have been delivered in rural areas over the last number of years, particularly from solar, wind and biomass energy sources."*

4.3.3 National Development Plan 2021-2030

The National Development Plan 2021-2030[12] (NDP) published in October 2021, in tandem with the NPF, sets out the Government's over-arching investment strategy and budget for the period 2021-2030.

The plan aims to balance the demand for public investment across all sectors with focus on improving the delivery of infrastructure projects. The NDP provides a platform from which investment can be provided and strategized in terms of economic growth, development and sustainability needs.

The key role of the NDP is to set out the updated configuration for public capital investment over the next 10 years in order to achieve the NSOs as set out within the NPF. The NDP outlines a number of key energy initiatives that set out to diversify our energy resources, and to assist in the transition towards a decarbonised society.

The NDP emphasises National Strategic Outcome 8: Transition to a Climate-Neutral and Climate Resilient Society, noting that:

> *"The Government will continue to support the deployment of additional electricity generation through the auction-based Renewable Electricity Support Scheme (RESS)".*

In achieving a Climate-Neutral and Climate Resilient Society, the NDP outlines strategic investment priorities which related to the aims of the Renewable Electricity Support Scheme (RESS). It is stated that the RESS auctions will deliver competitive levels of onshore wind electricity generation, which indicatively could be up to 8GW of onshore wind by 2030. The NDP also outlines that the RESS will also support the delivery of up to 5GW of additional offshore renewable electricity generation by 2030.

It is considered that such schemes, in conjunction with greater investment in renewable energy, diversity of supply, and increased utilisation and adoption of electricity storage, will significantly assist in promoting a low-carbon/less energy intensive supply. The investments outlined within the NDP will make a critical contribution to the achievement of a low carbon and resilient electricity system. The Project will contribute to the aims of the NDP in providing renewable electricity generation to the national grid.

4.3.4 Ireland's Greenhouse Gas Emission Projections 2022-2040

The National Climate Change Strategy designated the Environmental Protection Agency (EPA) with responsibility for developing annual national emission projections for greenhouse gases for all key sectors of the economy, including transport. The EPA publishes greenhouse gas emission projections on an annual basis and submits emission projections to the Commission as required under Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

The EPA's publication titled Ireland's Greenhouse Gas Emissions Projections (2023)[13] provides an updated assessment of Ireland's projected greenhouse gas emissions out to 2040 which includes an assessment of progress towards achieving its emission reduction

[12] Government of Ireland. 2021. National Development Plan 2021-2030.

[13] EPA. 2023. Ireland's Greenhouse Gas Emissions Projections.

targets to 2030 set down under the EU Effort Sharing Decision (Decision No 406/2009/EC). Ireland's 2020 targets to 2030 set down under the EU Effort Sharing Decision Scheme (non-ETS) sector emissions (i.e., agriculture, transport, the built environment, waste and non-energy intensive industry) on 2005 levels with annual binding limits set for each year beyond 2020. 2030 targets for EU Member States were adopted by the European Council in 2018. Ireland's 2030 target under the Effort Sharing Regulations is a 30% reduction of emissions compared to 2005 levels by 2030. There will be binding annual limits over the 2021-2030 period to meet that target.

4.3.5 Southern Regional Spatial & Economic Strategy 2020

The Southern Regional Spatial & Economic Strategy (RSES) came into effect on 31st January 2020. The RSES sets out a strategy to implement the NPF at a regional level. The RSES sets out a strategic vision which includes actions to mitigate against climate change. The RSES recognises the urgency to transition towards a low carbon economy and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture in order to safeguard and enhance the region, driving the transition to a low carbon and climate resilient society.

The RSES states the following in relation to wind energy:

> *"Wind energy is currently the largest contributor of renewable energy and it has the potential to achieve between 11-66GW of onshore wind and 30GW of offshore wind by 2050 (SEAI, 2026). The sector can make a significant contribution to meeting national energy demands while attaining our energy targets for 2020 and beyond".*

The RSES includes a range of policy objectives which support the development of renewable energy projects such as the Project. Objectives are summarised in **Table 4.2**.

Table 4.2: Relevant regional policy objectives

Policy	Description
RPO 50	It is an objective to further develop a diverse base of smart economic specialisms across the rural Region, including innovation and diversification in (among other things) renewable energy as a dynamic driver for the rural economy.
RPO 56	The RSES recognises the urgency to transition to a low carbon future and it is therefore an objective to accelerate the transition towards low carbon economy and circular economy through mechanisms such as the Climate Action Competitive fund.
RPO 95	It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.

Policy	Description
RPO 99	It is an objective to support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure in the Region in compliance with nation Wind Energy Guidelines.

The Project will aid in meeting the objectives set out in the RSES including diversification of the rural economy, actions against climate change and the sustainable development of wind energy at an appropriate location.

4.3.6 Cork County Development Plan 2022-2028

The current County Development Plan for Cork is the County Development Plan (CDP) 2022-2028[14]. The planning policies relevant to the Project are contained in Chapter 2: Core Strategy, Chapter 13: Energy and Telecommunications, Chapter 14: Green Infrastructure and Recreation, Chapter 15: Biodiversity and Environment, Chapter 16: Built and Cultural Heritage and Chapter 17 – Climate Action.

The Planning Report provided in **Section 8** of the planning application documentation, describes how the Project has addressed the key environmental issues pertaining to the proposals through its design and environmental impact assessment, and how it responds to local planning policy and objectives as contained in the Cork CDP, including the principle of development; landscape character and visual amenity; archaeology and cultural heritage; noise; biodiversity; and traffic and transport. Consideration of the planning policy context as relates to the alternatives considered is addressed in the following sections (4.3.6.1 – 4.3.6.6). These CDP policies and objectives have been reviewed and integrated into the design and assessment of the Project.

4.3.6.1 Chapter 2 – Core Strategy:

The aim of Chapter 2 of the CDP seeks *"Through the application of the planning principles set out in this document, to provide for the development of County Cork as an attractive, competitive and sustainable place to live, visit and do business, where the quality of its economy, natural and built environment, culture and the strength and viability of its communities are to the highest standards, in accordance with all relevant Government Policy and Guidance".*

Section 2.16.17 of the CDP set out that the CDP *"includes objectives to enhance and protect biodiversity which are set out in the Green Infrastructure and Biodiversity and Environment Chapters as well as site specific objectives which aim to support community led initiatives to protect biodiversity including the development of community led Biodiversity Action Plans and Pollinator Plans. The Planning Authority intends to commence the process of reviewing the County Biodiversity Action Plan within 12 months of the adoption of this Plan".*

[14] Cork County Council. 2022. Cork County Development Plan 2022-2028.

4.3.6.2 Chapter 13 – Energy and Telecommunications:

The aim of Chapter 13 of the CDP seeks to *"Facilitate and support investment in sustainable energy production and infrastructure in Cork to meet the future local, regional and national needs, while transitioning to allow carbon economy, addressing the climate change challenge with greenhouse gas emissions and protection of the environmental, cultural and heritage assets of the county. Cork will benefit through its contribution to national renewable energy targets, in a renewable energy framework that will also ensure the protection of local environmental assets in line with the National Planning Framework, the Regional and Economic Strategy and all other key energy policies".*

Key energy and telecommunications objectives relevant to the proposals include:

"Objective ET 13-1 Energy: *a) Ensure that County Cork fulfils its potential in contributing to the sustainable delivery of a diverse and secure energy supply and to harness the potential of the county to assist in meeting renewable energy targets and managing overall energy demand.*

b) During the life of this plan, the Planning Authority will prepare a renewable energy strategy for the county".

"Objective ET 13-4 Wind Energy: *In order to facilitate increased levels of renewable energy production consistent with national targets on renewable energy and climate change mitigation as set out in the National Energy and Climate Plan 2021-2030, the Climate Action Plan 2021, and any updates to these targets, and in accordance with Ministerial Guidelines on Wind Energy Development, the Council will support further development of on-shore wind energy projects including the upgrading, repowering or expansion of existing infrastructure, at appropriate locations within the county in line with the Wind Energy Strategy and objectives detailed in this chapter and other objectives of this plan in relation to climate change, biodiversity, landscape, heritage, water management and environment etc".*

"Objective ET 13-5 Wind Energy Projects: *a) Support a plan led approach to wind energy development in County Cork through the identification of area for wind energy development. The aim in identifying these areas is to ensure that there are minimal environmental constraints, which could be foreseen to arise in advance of the planning process.*

> *b) On-shore wind energy projects should focus on areas considered 'Acceptable in Principle' and 'Areas Open to Consideration' and generally avoid 'Normally Discouraged' areas as well as sites and locations of ecological sensitivity".*

"Objective ET 13-6 Acceptable in Principle: *Commercial wind energy development is normally encouraged in these areas subject to protection of residential amenity particularly in respect of noise, shadow flicker, visual impact and the requirements of the Habitats, Birds, Water Framework, Floods and EIA Directives and taking account of protected species of conservation concern".*

"Objective ET 13-7 Open to Consideration: *Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on:*

- *Residential amenity particularly in respect of noise, shadow flicker and visual impact;*

- *Urban areas and Metropolitan/Town Green Belts;*
- *Natura 2000 sites (SPA's and SAC's), Natural Heritage Area (NHA's), proposed Natural Heritage Areas and other sites and locations of significant ecological value.*
- *Architectural and archaeological heritage;*
- *Visual quality of the landscape and the degree to which impacts are highly visible over wider area.*

In planning such development, consideration should also be given to the cumulative impacts of such proposals".

***"Objective ET 13-9 National Wind Energy Guidelines:** Development of on-shore wind should be designed and developed in line with the 'Planning Guidelines for Wind Farm Development 2006' and 'Draft Wind Energy Development Guidelines 2019' and any relevant update of these guidelines".*

***"Objective ET 13-10 Development in line with Best Practice:** Ensure that wind energy development in County Cork are undertaken in observance with best industry practices, and with full engagement of communities potentially impacted by the development. In accordance with the Code of Practice 'Good Practice for Wind Energy Development Guidelines 2016', wind energy development projects, where members of the public can bring any concerns they have about operational difficulties, including noise and nuisance to the attention of the wind energy development operator".*

***"Objective ET 13-11 Public Consultation and Community Support:** a) Require wind energy developers to carry out active public consultation with the local community in advance of and in addition to the statutory public consultation required as part of the planning application process.*

b) Applications for large scale wind energy development require a 'Community Report' with the planning application documents detailing the full extent of community and wider public engagement".

***"Objective ET 13-13 Other Wind Energy Development:** Consider proposals where it can be shown that significant impacts on the following can be avoided:*

- *Residential amenity particularly in respect of noise, shadow flicker and visual impact;*
- *Urban area and Metropolitan/Town Green Belts;*
- *Sites designated for nature conservation, protected species, and habitats of conservation value;*
- *Architectural and archaeological heritage; and*
- *Visual quality of the landscape and the degree to which impacts are highly visible over wider areas".*

4.3.6.3 Chapter 14 – Green Infrastructure and Recreation:

The aim of Chapter 14 of the CDP is to "Encourage a more integrated and coherent approach to managing the Green Infrastructure assets of the County which will protect

and enhance biodiversity, provide for recreational and amenity facilities, maintain and enhance landscape character, protect architectural and archaeological heritage, improve ecological connectivity, provide for sustainable water management and facilitate climate change adaptation and mitigation by requiring the retention and strengthening of substantial networks of green space in urban, urban fridge and into the wider countryside leading to improved quality of life and better economic opportunities for communities across the County now and in the future".

Key green infrastructure and recreation objectives relevant to the proposals include:

"Objective GI 14-9 Landscape: *a) Protect the visual and scenic amenities of County Cork's built and natural environment.*

b) Landscape issues will be an important factor in all land-use proposals, ensuring that a pro-active view of development is undertaken while protecting the environment and heritage generally in line with the principles of sustainability.

c) Ensure that new development meets high standards of siting and design.

d) Protect skylines and ridgelines from development.

e) Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments".

"Objective GI 14-10 Draft Landscape Strategy: *Ensure that the management of development throughout the County will have regard for the value of the landscape, its character, distinctiveness and sensitivity in the Cork County Draft Landscape Strategy and its recommendations, in order to minimise the visual and environmental impacts of development, particularly in areas designated as High Value Landscapes where higher development standards (layout, design, landscaping, materials used) will be required".*

"Objective GI 14-12 General Views and Prospects: *Preserve the character if all important views and prospects, particularly sea views, rivers or lake views of unspoilt mountains, upland or coastal landscapes, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty as recognised in the Draft Landscape Strategy".*

"Objective GI 14-13 Scenic Routes: *Protect the character of those views and prospects obtainable from scenic routes and in particular stretches of scenic routes that have very special views and prospects identified in this Plan. The scenic routes identified in this Plan are shown on the scenic amenity maps in the CDP Map Browser and are listed in Volume 2 Heritage and Amenity Chapter 5 Scenic Routes of this Plan".*

4.3.6.4 Chapter 15 – Biodiversity and Environment:

The aim of Chapter 15 of the CDP is to "Ensure that the natural environment, biodiversity and ecosystems are protected, delivering benefits essential for all sectors of society and that Cork County contributes to efforts to reverse the loss of biodiversity and the degradation of ecosystems and the environment".

Key biodiversity and environment objectives relevant to the proposals include:

"Objective BE 15-2 Protect Sites, Habitats and Species: *(a)Protect all natural heritage sites which are designated or proposed for designation under European legislation,*

National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan.

(b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan.

(c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

(d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development.

(e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species".

***"Objective BE 15-3 Local Authority Plan Making:** (a)Ensure that biodiversity issues are considered at the earliest possible stages of plan making;*

(b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil Strategic Environmental Assessment and Appropriate Assessment requirements); and

(c) Carry out ecological impact assessment of plans and strategies as appropriate".

***"Objective BE 15-6 Biodiversity and New Development:** Provide for the protection and enhancement of biodiversity in the development management process and when licencing or permitting other activities by:*

(a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice;

(b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments;

(c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments;

(d) *Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate;*

(e) *Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats;*

(f) *Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain".*

"Objective BE 15-7 Control of Invasive Alien Species: *Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plan for new development where required".*

"Objective BE 15-8 Tree and Woodlands: *(a)Protect trees the subject of Tree Preservation Orders.*

(a) *Make use of Tree Preservation Orders to protect important trees or groups of trees which may be at risk or any tree(s) that warrants an order given its important amenity or historic value.*

(c) *Encourage the provision of trees for urban shading and cooling in developments in urban environments and as an integral part of the public realm.*

(d) *Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting.*

(e) *Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders".*

4.3.6.5 Chapter 16 – Built and Cultural Heritage

The aim of Chapter 16 of the CDP states "The Plan recognises the importance of identifying, valuing and safeguarding our archaeological, architectural and cultural heritage for future generations through appropriate protection, management and enhancement measures or via the sensitive development of this resource".

Key built and cultural heritage objectives relevant to the proposals include:

"Objective HE 16-9 Archaeology and Infrastructure Schemes: *All large scale planning applications (i.e. development of lands on 0.5 ha or more in area of 1km or more in length) and Infrastructure schemes and proposed roadworks are subject to an archaeological assessment as part of the planning application process which should comply with the Department of Arts, Heritage and the Gaeltacht's code of practice. It is*

recommended that the assessment is carried out following pre planning consultation with the County Archaeologist, by an appropriately experienced archaeologist to guide the design and layout of the proposed scheme/development, safeguarding the archaeological heritage in line the Development Management Guidelines".

4.3.6.6 Chapter 17 – Climate Action

The aim of Chapter 17 of the CDP states "Through the application of the planning principles set out in this document, to provide for the development of County Cork in a way which minimises the negative impacts of climate change and enhances our climate resilience while actively directing and facilitating effective positive climate action individually and collectively to contribute to our transition to a low carbon society".

Section 17.2.1 of the CDP deals with mitigation and adaption and states "Mitigation and adaptation are important strategies in responding to climate change and land use planning has a role in both. Mitigation deals with the causes of climate change and works to reduce man-made effects on the climate system by reducing greenhouse gas emissions, using renewable energy sources, increasing energy efficiency, and moving to a low carbon economy".

Key climate action objectives relevant to the proposals include:

"Objective CA 17-2: *In order to achieve a reduction in greenhouse gas emissions, an increase in renewable energy production, an increase in energy efficiency and enhanced biodiversity, support the transition to a low carbon, competitive, climate resilient and environmentally sustainable economy by 2050 through implementation of the polices of this plan that seek to deliver the following:*

- *compact growth,*
- *integrated land use and transport,*
- *sustainable transport choices,*
- *liveable settlements,*
- *renewable energy production and reduced energy consumption,*
- *enhanced ecological biodiversity and;*
- *climate adaptation measures such as through flood risk management, sustainable urban drainage systems and high quality placemaking and design"*

4.3.7 Cork County Council Climate Action Plan 2024-2029

Cork Couty Council's first Climate Action Plan 2024-2029[6] was adopted on the 12th February 2024. This Action Plan strengthens the links between national and international climate policy and the delivery of effective climate action at a local and community level, through 'Place-based' climate action. The Action Plan has several key themes including community, biodiversity/natural environment and land use, economy, transportation, built environment (e.g., infrastructure) and waste. The Action Plan highlights that 'spatial planning has a pivotal role in enabling and delivering positive climate action'. In addition, the plan aligns with the UN Sustainable Development Goals (SDGs). Two themes are highly relevant to the Project: Biodiversity and the Natural Environment, etc., and Built Environment, e.g. infrastructure. In relation to biodiversity the Action Plan highlights:

- *Measures such as woodland regeneration, restoration of wetlands and conserving healthy soils and vegetation can increase carbon sequestration, while also benefiting biodiversity and the natural environment...*
- *The idea of biodiversity net gain will be embedded in placemaking and the development process to focus considerations on biodiversity protections, health, and expansion, and requiring the use of nature-based solutions.*
- *The council will continue to co-ordinate and work in partnership with other stakeholders to facilitate the delivery of appropriate climate initiatives…. And contribute to our shared pursuit of the SDGs.*

In relation to the built environment the Action Plan highlights:

- *Support the development of renewable energy infrastructure, e.g. promote renewable energy generation, storage, and distribution infrastructure in accordance with the CDP within the county, whilst promoting the need to consider environmental protection requirements at the outset of and during such projects.*
- *Reduce the impact of flooding on the public realm, e.g. ensure due regard is given to environmental sensitivities, including water quality. Biodiversity, European sites, riparian corridors and aquatic ecology, during any supported development projects.*

In ensuring implementation, Cork County Council's Climate Action Plan 2024-2029 highlights the following:

> *'For Cork County Council to realise the ambition of the climate action plan, the council will need to exert its influence more broadly to maximise and support the climate action efforts of others and will be dependent on external stakeholders and partners.'*

As demonstrated in EIAR **Chapter 18 Climate**, the Project will significantly contribute to the implementation of Cork County Council's CAP24-29. The benefits of the proposed development in this regard are summarised in **Table 4.3** below.

Table 4.3: Summary of the Project's Benefits in relation to Climate Action

Project Component	Project Benefit
1. Biodiversity Net Gain (BNG)	Habitat creation & enhancement totaling 10.49 ha & 4,463m
2. Renewable Energy Generation	Maximum Export Capacity[15] (MEC) is approx. 40.5MW
3. Total GHG emissions from the operation of the scheme	0tCO_2e
4. Net GHG effect of the proposed development	< Zero
5. Atmospheric GHG Concentration	Reduction due to displacement of fossil fuel energy sources
6. Displacement of Fossil fuel-based electricity per annum	125,947MWhs per annum equal to >47,495 tCO_2 of fossil fuel-based electricity per year

4.4 Consideration of alternatives

4.4.1 Introduction

Article 5(1) of the Environmental Impact Assessment (EIA) Directive (2011/92/EU) on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (the EIA Directive) requires that the EIAR prepared by the developer contains at least:

> *"d)_a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.*
>
> *f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*

Annex IV (2) further states:

> *2) A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication*

[15] The exact MEC will be dependent on the output power of the turbine model available at procurement stage.

of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

In accordance with European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017) [16], this section of the EIAR contains a description of the reasonable alternatives studied for the Project, and an indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

4.4.2 Methodology

The EU Guidance Document on the preparation of the Environmental Impact Assessment Report (2017)[16] outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the developer needs to provide the following:

- a description of the reasonable alternatives studied; and
- an indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative' however the EU Guidance states that reasonable alternatives *"must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives"*. The guidance also acknowledges that *"the selection of alternatives is limited in terms of feasibility. In addition, an alternative should not be ruled out simply because it would cause inconvenience or cost to the developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative".*

The EPA EIAR Guidelines (2022)[17] state that *"It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option."*

In line with the above legislation and guidance, this section describes alternatives considered for the Project under the following headings:

- 'Do nothing' alternative
- Alternative locations – the site selection process
- Alternative turbine heights and turbine models
- Alternative site layouts and evolution of design
- Alternative grid connection points and routes
- Alternative turbine delivery routes
- Alternatives for site access

[16] EU. 2017. Guidance on the preparation of the Environmental Impact Assessment Report.

[17] EPA. 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

4.4.3 'Do-nothing' alternative

Article IV, Part 3 of the EIA Directive states that the EIAR should include *"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."* This is referred to as the "do nothing" alternative. EU EIAR guidance (2017)[16] states that this should involve the assessment of "*an outline of what is likely to happen to the environment should the Project not be implemented – the so-called 'do-nothing' scenario.*"

If the proposed wind energy development were not to proceed, the existing use of the site for agriculture would continue. In the 'Do- Nothing' option, however, the opportunity to capture a significant part of County Cork's renewable energy resource 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. The opportunity to generate local employment and investment would also be lost. These significant positive environmental and societal benefits which would arise from implementing the Project would not be realised in the do-nothing scenario. When faced with the real threat of climate change, and to meet Ireland's ambitious targets for renewable energy generation and reduction of carbon emissions the do-nothing scenario was not the chosen option.

4.4.4 Alternative locations – the site selection process

There are several factors that must be considered when selecting a site for wind energy development to achieve an economically viable project. In combination with policy and environmental considerations, the matters to be considered include the ability to achieve a minimum setback from dwellings as set out in national guidelines, wind resource available at the site, access to the national electricity grid and available land. The site selection exercise generally entails the application of key criteria to determine the most viable site for further testing and development.

Tullacondra Green Energy Limited conducted a technical review of potential candidate sites for wind energy development over a wide area in the region. The first step in the site selection process was to examine high level constraints to eliminate areas which were deemed unsuitable for wind turbines. The constraints are derived from best practice and regulatory guidelines and publicly available Geographical Information Systems (GIS) datasets.

The renewable energy or wind energy strategies for a county are an obvious starting point when searching for suitable sites. The county strategies are developed in accordance with the Wind Energy Development Guidelines (2006)[18] which prescribe a step-by-step process in a sieve analysis to identify locations most suitable for wind energy development. This includes the available wind resource (Step 1), landscape sensitivity mapping (Step 2), and built and natural heritage and amenity designations (Step 3). This sieve analysis is the basis for identifying areas "*where wind energy developments would be 'acceptable in principle', where they would be 'open for consideration', and where they would be 'not normally permissible'*". In Step 4, the results of Step 3 are integrated with

[18] Department of Housing, Local Government and Heritage. 2006. Wind Energy Development Guidelines.

information on accessibility to electricity transmission infrastructure to identify those areas which are readily capable of development or where further grid works are required to accommodate wind energy development.

The selection criteria and outline of basis for assessment for each criterion which contributed to the selection of the Tullacondra site are listed in **Table 4.4**.

Table 4.4: High-level site selection criteria

Criteria	Description	Suitability of the Tullacondra site
Planning policy	In essence, the main high level constraints which are considered by a developer in a site selection process are identified in a county's renewable or wind energy strategy. It stands to reason that a county's renewable energy or wind energy strategy is the first criteria to apply in a search for potential sites.	Following review of the relevant CDP 2022 – 2028, Section 3.18, including the Wind Energy Strategy (2014) Map, it was determined that the Tullacondra site is in an area designated 'Open to Consideration'. This is displayed in **Figure 4.1**.
Available wind resource	Wind resource assessment is the process by which wind energy developers estimate the future energy production of a wind farm. Accurate wind resource assessments are crucial to the successful development of wind farms. The Irish Wind Atlas, published by the Sustainable Energy Authority of Ireland (SEAI), uses long term weather model data to predict the long-term average wind speeds in Ireland, and is used by wind developers and local authorities to determine the best locations for future wind farm development.	Average wind speeds at a height of 100 metres at Tullacondra are approximately 7.3 metres per second. This indicates viable values for wind energy development at this location, considering values of 3-5 meters per second are required for turbines to start operating.
Grid connection feasibility	Assessment of potential connection to the electrical grid and the means of connection is a main consideration when selecting a site for wind energy development.	Tullacondra Green Energy Limited engaged experts to review the potential grid connection options for the proposed wind farm and to advise on the availability of grid capacity at substations at Buttevant, Mallow, and a loop-in connection to the existing 110kV Overhead line that connects Mallow to Charleville, and to identify a viable means of connection whether overhead or underground, and potential routes. Following review by a specialist electrical engineer, it was

Criteria	Description	Suitability of the Tullacondra site
		determined that, per the node assignment rules, the Project would be assigned to the nearest 110kV busbar. The upgrade works ongoing at Buttevant would not be sufficient for the connection of Tullacondra as this would require upgrading the substation from 38kV to 110kV and would require an upgrade to the 38kV line connecting Buttevant to Mallow/Charleville to 110kV. Tullacondra Green Energy Limited had a pre connection application meeting with EirGrid on 19th May 2022 to discuss the proposal for a connection into Mallow 110 kV substation and the requirements for grid cabling and connection into the substation. Following this meeting, it was confirmed that there is capacity at Mallow for connection of a wind farm. The proximity of the Tullacondra site to the Mallow substation, where there is available capacity, was also a determining factor in selecting this location.
Proximity to dwellings and other properties	The 2019 Consultation Draft Guidelines on Wind Energy Development advise a minimum amenity setback of 4 times the blade tip height of a turbine from the nearest point of curtilage of non-financially associated dwellings, subject to a minimum 500m.	Taking a precautionary approach in the site-level assessment, with a maximum turbine height of 175m, an amenity buffer distance of 700m was applied to the nearest point of curtilage of non-financially associated dwellings to determine the site area and extent available for wind energy development. This is displayed in .
Planning history	Planning history of the site and other wind farm projects in the vicinity and wider area.	The nearest wind energy developments to the Tullacondra site are located 9km to the northwest (operational - Kilberehert wind farm) and 10.9km to the north (proposed - Annagh wind farm). These minimum distances help avoid or reduce the likelihood of significant cumulative noise and shadow flicker effects.

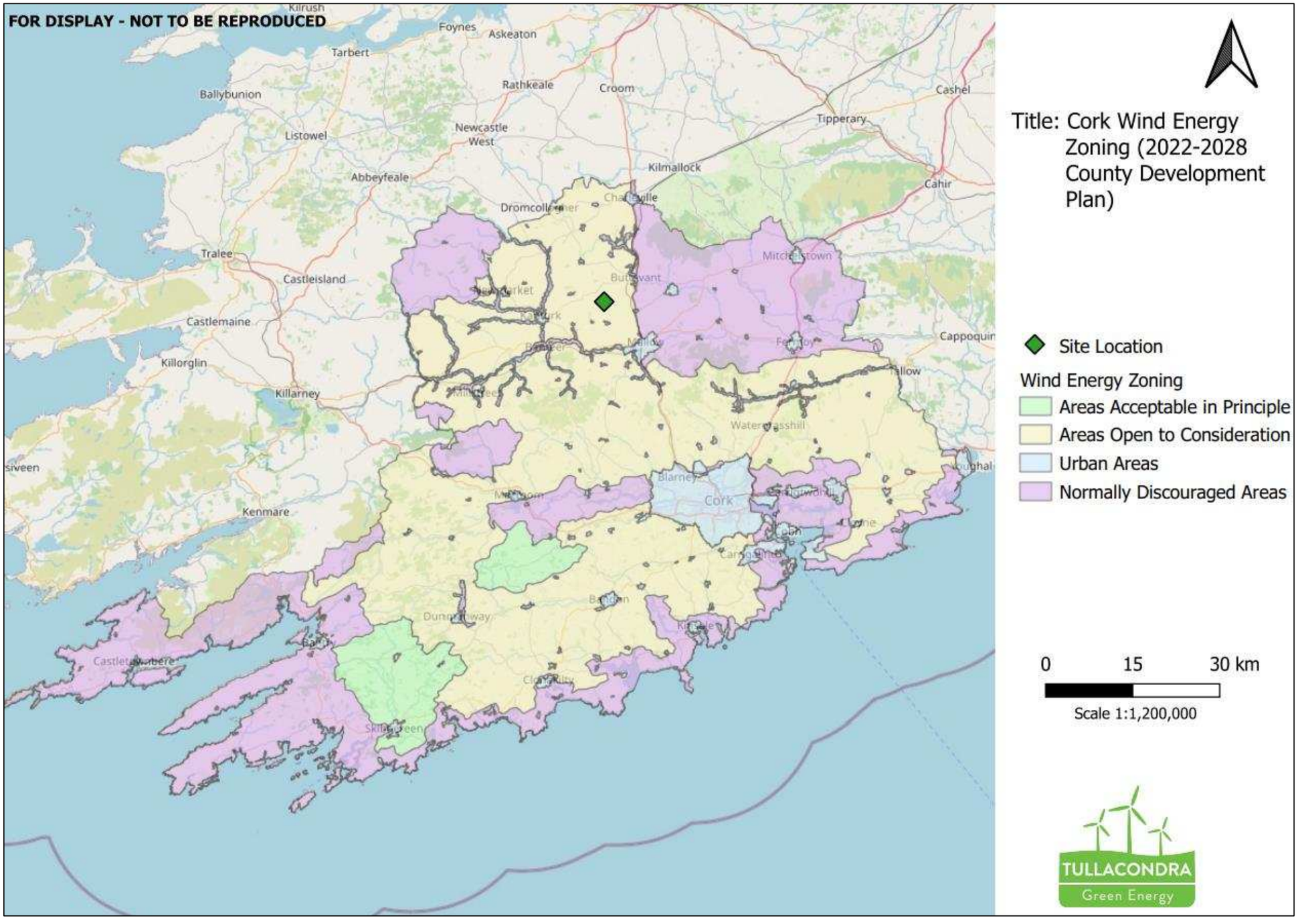


Figure 4.1: Site shown in relation to County Cork Wind Energy Strategy (2014) designations

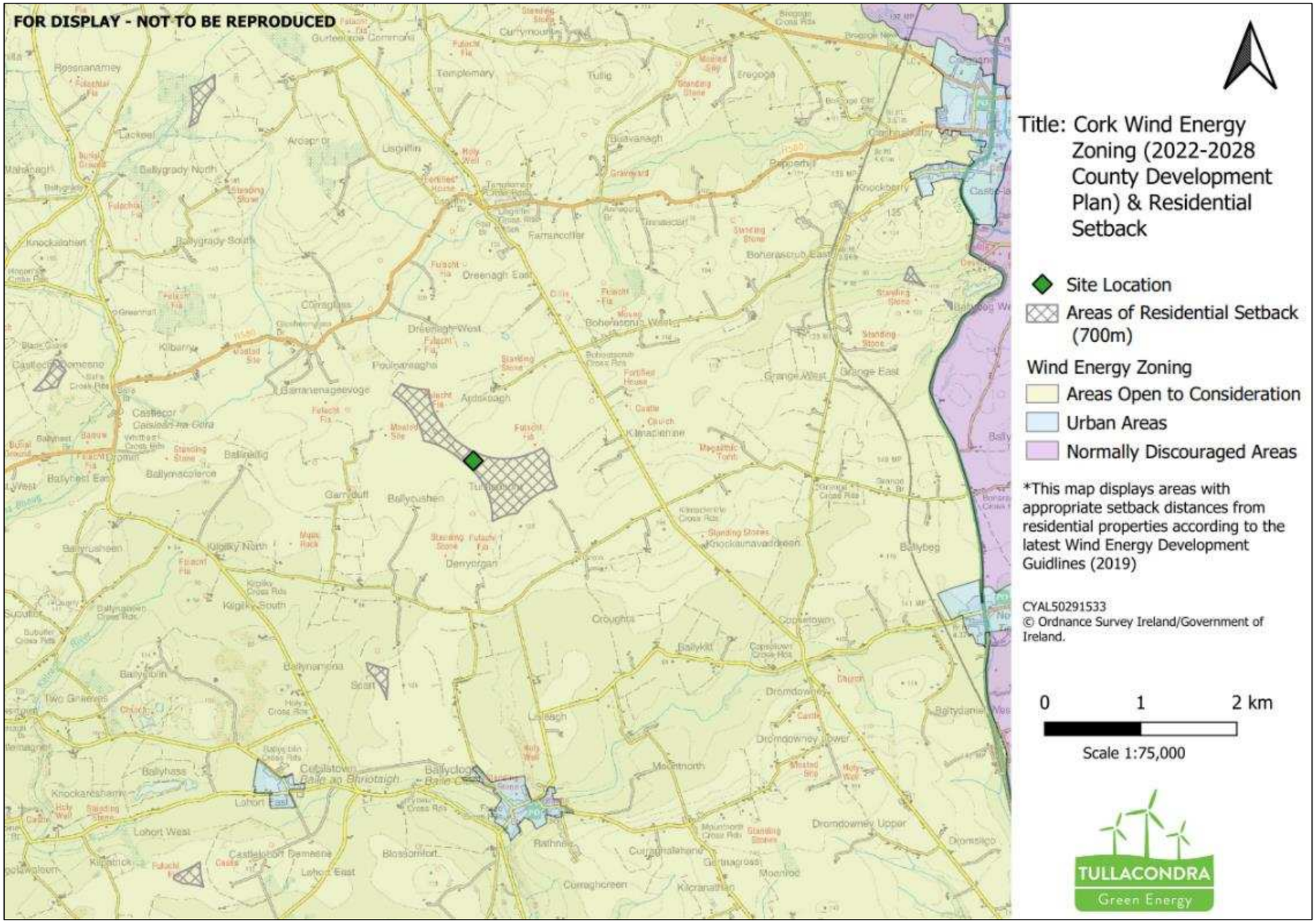


Figure 4.2: Amenity setback of 700m showing potential area for turbines in this location

4.4.4.1 Site-specific assessment

Following identification of suitable sites, site-specific assessments were then conducted by Tullacondra Green Energy Limited's wind development team with input from relevant subject matter experts to determine, from among the potentially suitable sites across the region, which sites would be most suitable to bring forward for preliminary engineering design and environmental assessment.

The site-specific assessments included desktop studies, site visits and surveys, and consultations to:

- determine general landscape character, visibility from scenic routes or protected views;
- identify other potential constraints such as waterbodies, overhead lines, telecoms masts, forested areas, etc.
- confirm of the potential presence/absence of sensitive habitats and protected species; and
- assess potential turbine transport routes.

The viability of a wind energy project at the Tullacondra site was further determined through testing various turbine heights and layouts within the potential developable area (considering the host of constraints identified in site specific assessment) to balance optimising energy capture from wind with the imperative to avoid or reduce impacts related to noise, shadow flicker and visual amenity.

4.4.5 Alternative turbine heights and turbine models

The Applicant instructed the RSK Project Team to undertake modelling to test different turbine heights (i.e., 160m, 170m and 175m), and different turbine models including the Vestas V136 and V150, with varying turbine layouts depending on the turbine model. A 3D model using Google Earth was created to examine the potential landscape and visual effects from public roads and properties surrounding the Tullacondra site. Similarly, a preliminary noise model was employed to determine the turbine model suitable for the site. Following this testing, the turbine model selected for the Project was the Vestas V150 with a 175m tip height (100m hub height and 150m rotor diameter).

4.4.6 Alternative site layouts and evolution of design

4.4.6.1 Key design drivers for the wind farm site

Selection of the turbine model suitable for the Tullacondra site, and design of the Project has been a collaborative process from the outset involving designers, developers, engineers, environmental, hydrological and geotechnical, archaeological specialists and traffic consultants; and consultation with landowners and various stakeholders.

Throughout the preparation of the EIAR, the layout of the proposed development has been revised and refined from its initial 10 turbine layout to the current proposed 9 turbine layout. The proposed wind farm has been designed to minimise potential environmental effects while at the same time maximising the energy yield of the wind resource available

at the site. The design of the wind farm site was informed by the constraints listed below and illustrated in **Figure 4.3**.

- Maintaining a setback from proposed turbines of 700m (four times the tip height) to the nearest point of curtilage of non-financially involved dwellings), subject to a mandatory minimum distance of 500m for all dwellings (per Section 6.18 of the 2019 Draft Revised Wind Energy Guidelines)
- Maintaining a setback buffer from all wind farm infrastructure of at least 20m from known archaeological monuments and cultural heritage features.
- Maintaining a buffer of at least 15m from drainage channels where possible, and a 25m buffer for the historically mapped water feature approximately 90m southwest of the proposed location of T4
- Maintaining a buffer of at least 25m from known karst features
- Mapping and assessment of existing telecommunications infrastructure links
- Avoiding non-native invasive species.

The Project is proposed on a site within existing agricultural fields bounded by established hedgerows, with farming operations ongoing. In relation to current land use and operations, when designing the Project, Tullacondra Green Energy Limited and the RSK Project Team had objectives to minimise the impact on hedgerows and capitalise on opportunities for biodiversity enhancements; minimise impact on farm operations during construction and operation phases and maximise the use of existing farm tracks. In respect of these objectives, the owners of the option lands for the wind farm site (within the blue line boundary shown in **Figure 4.3**) were consulted throughout the design process.

The design of the Project and the selection of preferred options for various project elements (i.e., grid connection route, turbine delivery route, and access to the wind farm site) evolved in response to findings from baseline surveys; the construction solutions and mitigation measures recommended from the assessment of likely significant effects of the proposals on the environment; and feedback received from community and stakeholder engagements including the landowners, and the Cork County roads and planning authorities, as reported in EIAR Chapter 3. Scoping Consultations, Community Engagement and Key Issues.

Figure 4.3: Tullacondra constraints map

4.4.6.2 *Turbine layouts*

In the layout, turbines were positioned to optimise access track layout and configuration of hardstands and crane pads; and observe the established setbacks and buffers referred to above. Every shift of a turbine had a potential knock-on effect on other turbine positions and had to be checked to ensure appropriate separation distances could be met to maximise wind energy yield.

4.4.6.3 *Internal access track design*

Internal access tracks are required to enable transport of turbine components and construction materials to each of the turbine locations. Internal access tracks must be of a gradient and width sufficient to allow safe movement of equipment and vehicles, especially at junctions. Alternative access track layouts were considered in tandem with the changes to the proposed turbine layout and following examination of options for access to the site, as the design evolved. As turbine locations were assessed and finalised, the most suitable routes between turbine locations were identified, considering the physical constraints of the site and utilising the most direct route between turbines to minimise the footprint of the development, and avoid hedgerow loss where possible.

The aim of the access track design was to utilise the configuration of existing farm tracks as far as possible. Temporary access tracks were introduced to achieve the turning radii, contingent upon the chosen turbine blade length to facilitate the transport of turbine components around the site and maneuvering at turbine positions for the set down of components and assembly process. Existing farm tracks are to be upgraded to provide the width and strength required for the transport of turbine components and passage of heavy goods vehicles across the site during construction phase. The main aim for track upgrades or introducing temporary access tracks was to ensure minimal disruption to farming operations while at the same time minimising loss of hedgerows.

Final adjustments were made to the temporary (construction) and permanent (operational) internal access track arrangement to account for setback buffers from known archaeological monuments; following feedback from the Project Ecologist,; and after extensive consultation with landowners. The main aim was to ensure that disruption to farming operations on the site during construction and operation phases would be minimised.

4.4.6.4 *Location of ancillary infrastructure and temporary works*

The ancillary structures required for the proposed development include the site entrances, temporary construction compounds and areas for the temporary storage of excavated material, an electricity substation, and a permanent meteorological mast.

The examination of alternatives for site entrances and the selection of the preferred site access arrangement for the construction and operation phases is discussed in detail in section 4.4.9.

The location and configuration of the temporary construction compounds was selected based on the final track layout, in a location central to the site, and only after consultation with the landowners to ensure minimal disruption to farming operations during the construction phase. Following a detailed engineering assessment of the earth materials

required to be excavated from the site, and the earth materials to be brought on to the site to construct the infrastructure, including consideration of phasing, the amount, configuration and location of designated areas for the temporary storage of earth materials was determined. Again, landowners were consulted to ensure minimal disruption to farm operations during the construction phase.

The location of the electrical substation on the site was selected based on distance from the turbines and landowner requirements. The position of the substation was amended to be closer to the track, and to avoid non-native invasive species in locating the temporary compound to the east of the substation.

The optimal location of the permanent met mast is either central to the site or downwind of turbine positions, and its height should be equal to hub height of the proposed turbines, in this case, a 100m high lattice type. There were no concerns in relation to landscape character of visual amenity for the permanent met mast at its selected location in the centre of the site.

4.4.6.5 Evolution of design

The design of the proposed Tullacondra Wind Farm was an iterative process which considered a range of alternative turbine layouts, with plans for site infrastructure and locations for temporary works changing in response to changes in turbine positions.

The project design evolved from an initial 10-turbine layout to the 9-turbine layout now proposed. The design iterations were influenced by potential environmental effects which were identified throughout the environmental assessment, with the main aim of avoiding in the first instance or reducing those effects through project design. These layout iterations are detailed in **Table 4.5** and illustrated in **Figure 4.4** to **Figure 4.7**.

Table 4.5: Evolution of project design

Design Iteration	Description of layout / iteration	Reason for change
Initial Iteration	An initial design within the developable area of the wind farm site consisted of 10 wind turbines. This initial 10-turbine layout is shown in . This represented the maximum number of turbines which could be developed at the site. It was considered with respect to environmental constraints, including karst features, mapped watercourses and visual amenity. The housing setback buffer for this initial design was based on 650m from the nearest dwellings. This design achieved the desired megawatt (MW) output for the project at approximately 45MW.	N/A
Design Iteration 1	An alternative layout was brought forward for Design Iteration 1 shown in , which aimed to provide fewer turbines with a greater tip height and rotor diameter. The 9-turbine option reduced the loss of habitat by providing less hardstanding areas than the initial 10-turbine layout. All turbine locations were modified, with the exception of T4, T5 and T6.	The working footprint of the wind farm was finalised with involved landowners and the footprint was optimised to maximise the power output while increasing the setback distances from houses to 700m. In addition, new house planning permissions in the vicinity modified the setback buffer.
Design Iteration 2	Design Iteration 2, shown in **,** includes an indicative civil design layout and modifications to the locations of T2 and T8. In addition, there was a new planning permission in the vicinity modified the setback buffer, however, this did not have an effect on the turbine layout.	The modification to turbine position T2 was due to the proximity to an archaeological feature and to increase the spacings between T1 and T2. T8 was moved to increase the spacing separation between T7 and T8, while maintaining the 700m setback from dwellings.
Design Iteration 3	Design Iteration 3, shown in **,** is referred to as the 'final design iteration'. This involved the production of a Civil Infrastructure Design which aimed to utilise the existing agricultural access tracks and existing field boundaries	Following consultations with the County Cork Planning Authority on 17th November 2022, and 2nd August 2023 (as reported in EIAR **Chapter 3. Scoping Consultations, Community Engagement and Key Issues**), the key issue which was

Design Iteration	Description of layout / iteration	Reason for change
	and contours to achieve greater design harmony with the existing environment, in particular the hedgerows. The design focus was to maintain a distance from hedgerows, utilise existing breaks in them, and keep the loss to a minimum. To minimise effects on hedgerows, T5, T6 and T9 locations were modified to increase their distance from adjacent hedgerows.	required to be addressed related to the avoidance of hedgerow loss in project design. Following feedback received from the second pre-planning consultation, the Applicant and the RSK consultant team re-visited the design to avoid hedgerow loss (as far as possible). This re-design involved an engineering assessment to re-orient hardstanding, crane pads and blade fingers, in some cases requiring the re-configuration of access tracks, with input from the Project Ecologist on habitat mitigation and enhancements.

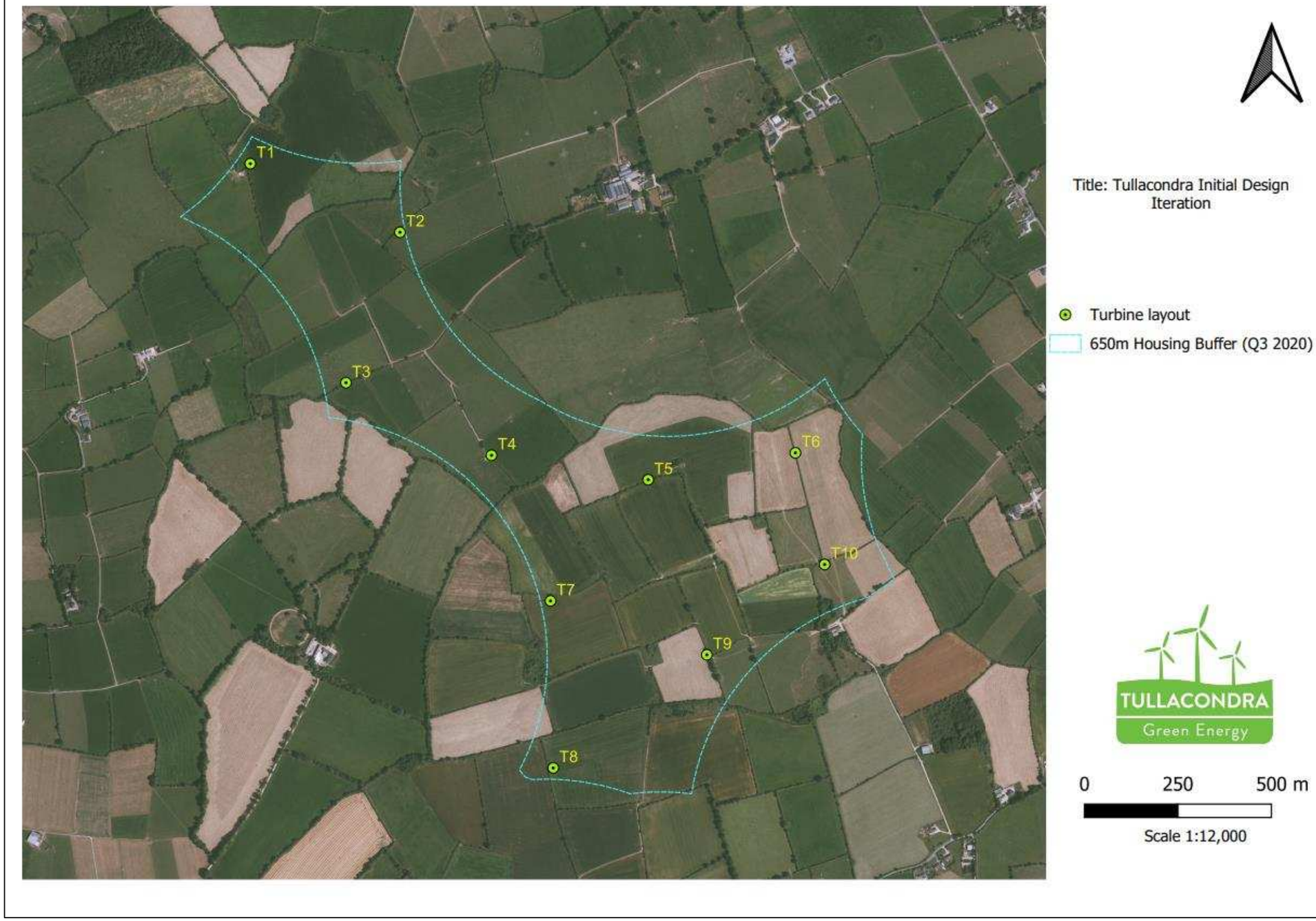


Figure 4.4: Initial 10-turbine layout

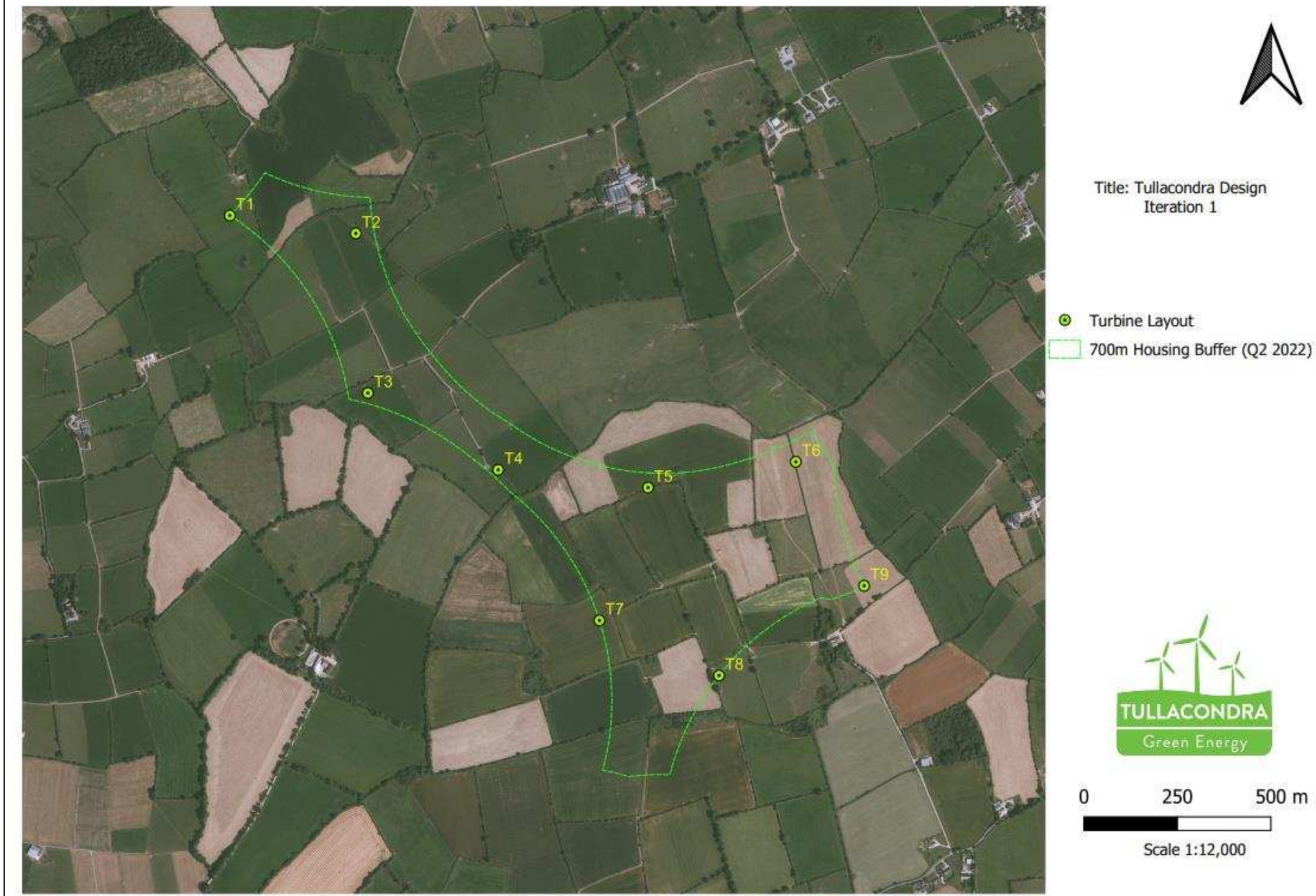


Figure 4.5: Design iteration 1

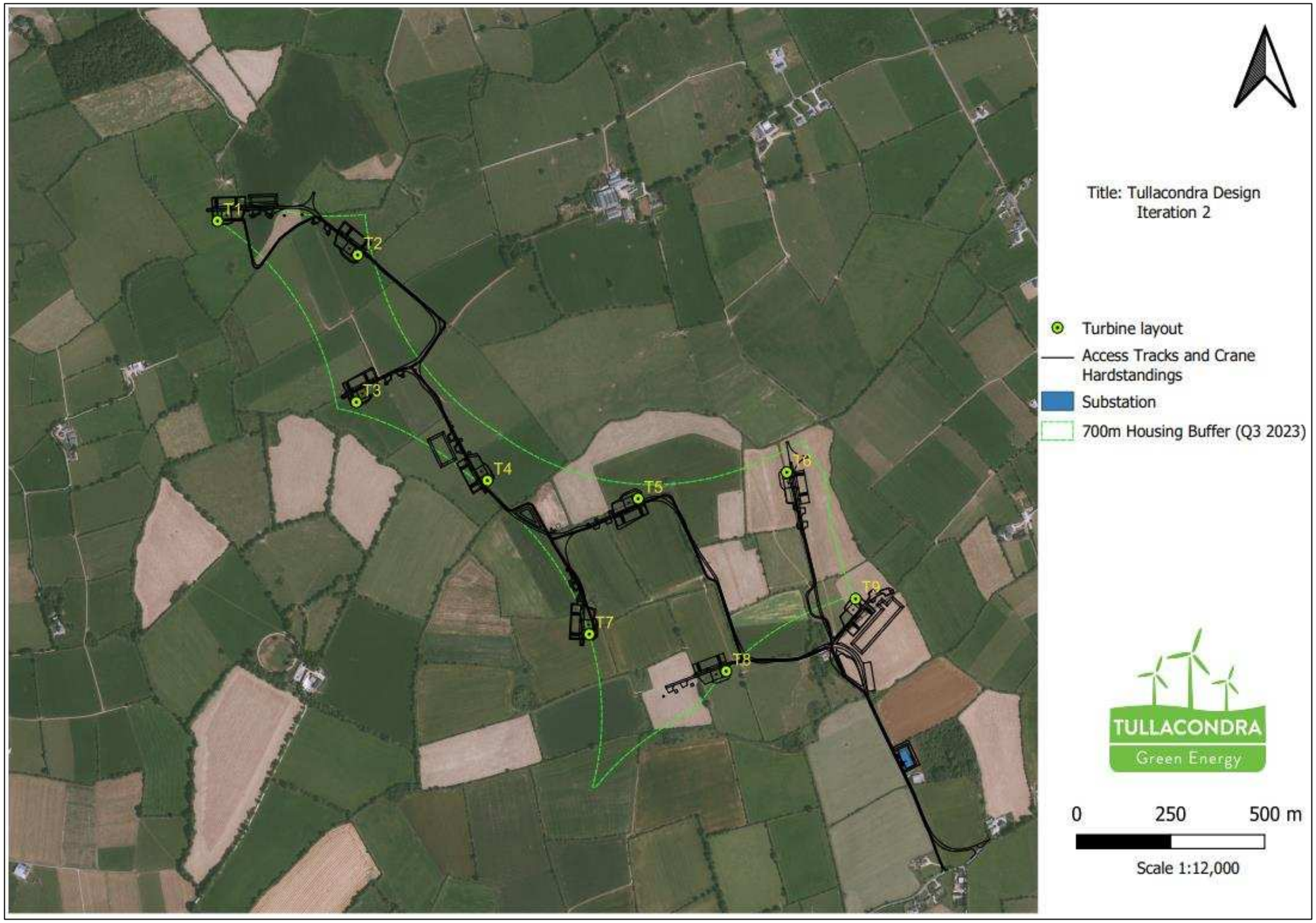


Figure 4.6: Design iteration 2

Figure 4.7: Design iteration 3

4.4.6.6 *Reduction of habitat loss through optimised design*

The final optimised wind farm design (Design Iteration 3) is presented in the plans and particulars and is assessed in the EIAR for the planning application for the Project.

As described in **Table 4.5**, one of the main aims in the evolving design was minimising habitat loss and following consultation with the Cork County Council Planning Authority, the focus in the final design iteration was especially avoiding hedgerow loss. **Table 4.6** to **Table 4.8** provide information on temporary and permanent loss by the main habitat types on the Tullacondra site, and demonstrate how, through optimised design, the Project has achieved a substantial biodiversity net gain. **Figure 4.8** illustrates the hedgerow loss associated with Design Iteration 2 and **Figure 4.9** shows the Final layout (Design Iteration 3) with minimal hedgerow loss, with permanent loss of hedgerows having been reduced from 1.5km in Design Iteration 1 to 211m in Design Iteration 3.

Table 4.6: Biodiversity net gain Design Iteration 1

Habitat type	Temporary loss	Permanent loss	Habitat reinstatement	Additional compensatory planting
Hedgerows	478 m	1,525 m	478 m	5,755 m
Treelines	65 m	189 m	65 m	84 m
Woodland	0	0	0	1.96 ha
Meadow	0	0	0	3.88 ha

Table 4.7: Biodiversity net gain Design Iteration 2

Habitat type	Temporary loss	Permanent loss	Habitat reinstatement	Additional planting
Hedgerows	322 m	756 m	322 m	2,890 m
Treelines	11 m	89 m	11 m	135 m
Woodland	0	0	0	1.4 ha
Meadow	0	0	0	7.24 ha

Table 4.8: Biodiversity net gain Design Iteration 3

Habitat type	Temporary loss	Permanent loss	Habitat reinstatement	Additional planting
Hedgerows	220 m	211 m	20 m	2,911 m
Treelines	0 m	0 m	0 m	135 m
Woodland	0 m	0 m	0 m	1.04 ha
Meadow	0 m	0 m	0 m	7.21 ha

The Habitat Management (HMP) provided in EIAR **Volume III, Appendix 7.3** presents the proposals for biodiversity offsetting and enhancement and demonstrates a positive and proactive commitment to achieving biodiversity net gain for the proposed Project.

Figure 4.8: Hedgerow loss associated with Design Iteration 2

Figure 4.9: Final layout (Design Iteration 3) with minimal hedgerow loss

4.4.7 Alternative grid connection points and routes

At an early stage, consideration was given to connecting the wind energy project to Buttevant 38kV station as the developers were aware of the ongoing uprating works at this station early in 2023. Following review by a specialist electrical engineer, it was determined that, per the node assignment rules, the Project would be assigned to the nearest 110kV busbar. The upgrade works ongoing at Buttevant would not be sufficient for the connection of Tullacondra as this would require upgrading the substation from 38kV to 110kV and would require an upgrade of the 38kV line connecting Buttevant to Mallow/Charleville to a 110kV line.

The project developers also consulted with Eirgrid to determine the capacity available at Mallow, and the feasibility of a loop-in connection to the existing 110kV overhead line that connects Mallow to Charleville substations, and the grid connection routes and options for the grid cabling from the site to the substation. Following this specialist advice and consultation with Eirgrid, Tullacondra Green Energy Limited proposes to connect into the Mallow 110kV substation at St. Joseph's Road, Mallow as part of the proposals.

Engineering and environmental assessments were undertaken on the proposed grid connection route options displayed in EIAR **Chapter 1 Introduction**, **Figure 1.1**. This included field survey and engagement with the Cork County Roads Authority the Cork National Roads Office, Transport Infrastructure Ireland, Gas Networks Ireland, and Iarnród Éireann to determine the best engineering solution for crossings of National Roads, bridges and watercourses, and reported in EIAR **Chapter 3 Scoping Consultations, Community Engagement and Key Issues**.

Table 4.9 provides a summary of the grid connection crossing points and proposed solutions for grid connection route Option 1, the route which is included in the application for planning permission. **Table 4.10** provides a summary of the crossing points and proposed solutions for grid connection route Option 2, up to the point where it meets Option 1 route, which is the same.

The technical challenges associated with crossing the railway line and the gas transmission line, with the need to enter third party lands, were key elements of the decision making process and the decision to select Option 1 grid connection route for inclusion in the planning application.

Details of Option 1 grid connection crossing points and proposed solutions are provided in Planning Application Documentation (**Part 2** – Planning Drawings).

Details of Option 2 grid connection crossing points and proposed solutions are provided below**.**

The grid connection from the wind farm site to the boundary of the Mallow substation will be approximately 13.5km via a 38kV cable which will be undergrounded and constructed primarily within the existing road corridor. The installation of the grid cabling and connection to the boundary of the Mallow 110kV substation will comply with ESBN / EirGrid specifications and technical and operational requirements. As the Mallow 110kV substation is a live station, ESBN safety rules will apply from the station boundary. ESBN will be responsible for the routing of the Grid Connection cable through the substation compound and to connect to one of the existing cable bays within the substation. The works anticipated would include laying a trench from the substation switchgear building

to the substation boundary where it will connect to the Grid Connection Route for the Project. The grid connection works within the Mallow 110kV substation do not form part of the development for which planning permission is sought and will be subject to a separate planning application.

Table 4.9: Option 1 grid connection crossing points and proposed solutions

Crossing Point	Drawing Ref. (refer to planning pack)	Location	Description	Proposed Construction Solution
1	20910-NOD-XX-XX-DR-C-08210	L1205-19 at Ballykitt, Mallow	Existing cattle underpass	From examination of the layout plan (Drg. 103 PL1) and section (Drg. 105 PL1) drawings on the planning file (County Cork P. A. Reg. Ref. 216326) and measurements undertaken in the field, it has been determined that there is sufficient cover over the underpass for installation of the grid cable within the road at this crossing.
2	20910-NOD-XX-XX-DR-C-08211	L1205-01 at Greenvale, Ballybeg, Twopothouse, Mallow	Under railway bridge	From measurements undertaken in the field it has been determined that there is sufficient height between the bridge archway and road level (4.29m) and width (6.2m) for undertaking grid installation works under the bridge at this location.
3	20910-NOD-XX-XX-DR-C-08212	L1205-01 at Greenvale, Ballybeg, Twopothouse, Mallow	Crossing interface with gas mains	Following consultation with Gas Networks Ireland, it has been determined that the gas mains is 2.4m depth below the level of the road. Grid ducting will be laid in trefoil to a depth of 1.25m which will provide cover of 1.15m to the depth of the gas line.
4	20910-NOD-XX-XX-DR-C-08213	L1205-01 at New Twopothouse Village	Crossing the N20	Horizontal Directional Drilling (HDD) is proposed for crossing under the N20. A launch pit will be constructed within the L 1205-01 public road approximately 20m before the junction with the N20. The reception pit will be located approximately 8m from the N20 in Council lands in front of Tower B & B.
5	20910-NOD-XX-XX-DR-C-08214	Junction R581 with L1207 at Hazelwood, Old Twopothouse Cross Roads	Crossing interface with water lines	Open cut trenching is proposed at this location following proactive engagement with the Local Authority and Irish Water. A traffic management lane closure operation will be required along the R581 on the left-hand side of the road heading in an easterly direction. To cross the road, a 4- way traffic management system will need to be in place. There are existing Irish Water utilities on the Hazelwood junction road that will be required to be crossed and in compliance with Irish Water Standards. There appears to be sufficient room on the left-hand side of the L1207 road heading in a southerly direction beside an existing 150cm

Crossing Point	Drawing Ref. (refer to planning pack)	Location	Description	Proposed Construction Solution
				diameter watermain which is installed in the road verge. There appears to be sufficient space in the left hand lane to install the new ducts with a lane closure only required under a controlled traffic management system.
6	20910-NOD-XX-XX-DR-C-08215	L5320 at Ballyviniter Upper	Within Ballyviniter Bridge	It is proposed to cross the existing Ballyviniter Bridge along the L5320 via Open Cut trenching. The trench will be constructed on the right hand side of the road heading in a southerly direction and crossing the bridge in the existing grass verge. There is an existing water service in the verge that may have to be diverted if still live. The trench will be constructed with minimal cover and a structural concrete slab as cover to ensure protection will be required for the new service. There is sufficient space available to replace the grass verge with a concrete finish which will not affect the road layout. Extensive discussions have taken place with the Local Authority on this proposed crossing.
7	20910-NOD-XX-XX-DR-C-08216	L5320 at Ballyviniter Lower, Spa Glen, Mallow	Crossing watercourse	HDD is proposed for crossing under a watercourse (Blackwater (Munster_140) – also locally known as Caherduggan South) at this location. A launch pit will be constructed within the L53320 public road approximately 18m before the junction with the N72. The reception pit will be located approximately 6m from the N72 in the carriageway of a former public road now in part private ownership

Table 4.10: Option 2 grid connection crossing points and proposed solutions

Crossing Point	Figure Ref.	Location	Description	Proposed Construction Solution
1B	**Figure 4.10**	L5523 at Ballybeg	Crossing railway line and gas transmission line	As well as crossing a gas transmission line, HDD is proposed for crossing under the railway line. A launch pit will be constructed within the L5523 public road approximately 25m before the junction and the railway bridge. The reception pit will be located approximately 7m from the end of the railway bridge in the public road. This will be subject to agreement with Irish Rail, the local authority, and ESBN. Alternatively, the launch and reception pits will be located in third party lands adjacent to the railway bridge. This is illustrated in Figure 4.10.
2B	**Figure 4.11**	L5523 and N20 at Boherash Cross	Crossing N20	HDD will be required for crossing under the N20. A launch pit will be constructed within the L5523 public road approximately 25m before the junction with the N20. The reception pit will be located approximately 7m from the N20 on L5568 in Council lands.
3B	**Figure 4.12**	L5568	Narrow local road	Open cut trenching will be required at this location following proactive engagement with the Local Authority and Irish Water. A traffic management full lane closure operation with a rolling basis will be required along the L5568.

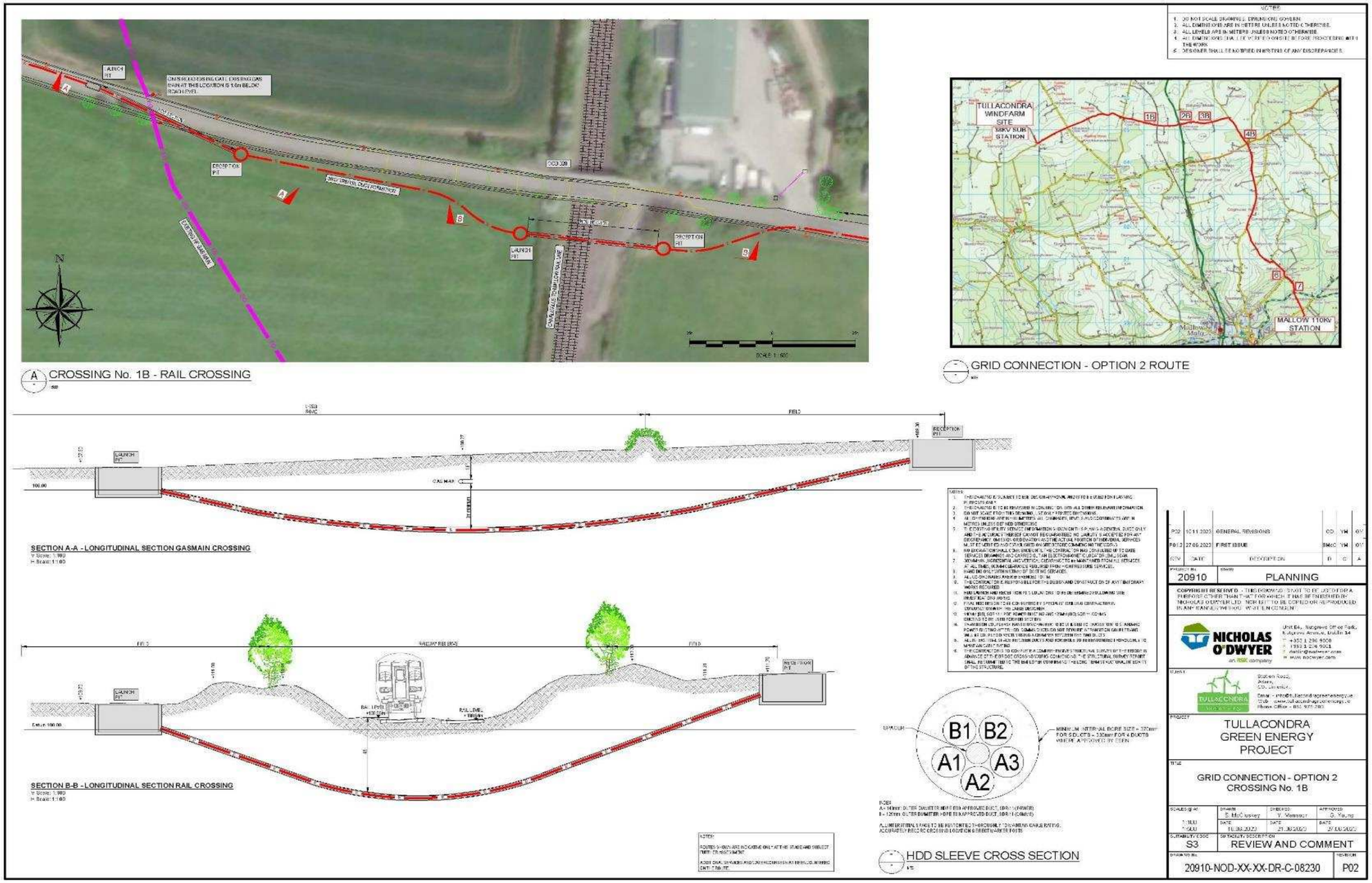


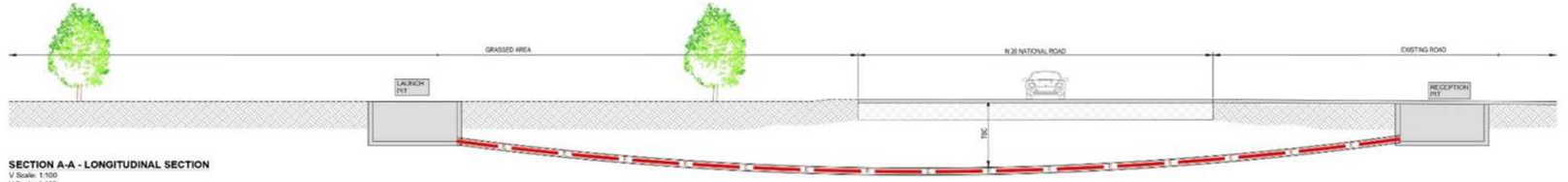
Figure 4.10: Grid Crossing Option 2 - Crossing No. 1B

A CROSSING No. 2B - N20 CROSSING

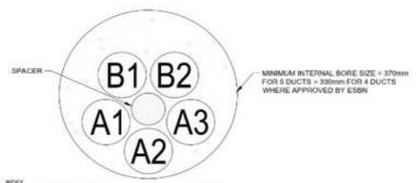
NOTES

1. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN.
2. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS SHALL BE VERIFIED ON SITE BEFORE PROCEEDING WITH THE WORK.
5. DESIGNER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES.

GRID CONNECTION - OPTION 2 ROUTE



SECTION A-A - LONGITUDINAL SECTION
V Scale: 1:100
H Scale: 1:100



INDEX
A = 140mm OUTER DIAMETER HDPE ESB APPROVED DUCT, SDR-11 (POWER)
B = 125mm OUTER DIAMETER HDPE ESB APPROVED DUCT. SDR-11 (COMMS)

ALL INTERSTITIAL SPACE TO BE BENTONITED THOROUGHLY TO MAINTAIN CABLE RATING.
ACCURATELY RECORD CROSSING LOCATION & ERECT MARKER POSTS

HDD SLEEVE CROSS SECTION

NOTES:

ROUTES SHOWN ARE INDICATIVE ONLY AT THIS STAGE AND SUBJECT FURTHER ASSESSMENT.

ADDITIONAL SERVICES AND WATERCOURSES MAY BE ENCOUNTERED ON THE ROUTE.

NOTES:

1. THIS DRAWING IS SUBJECT TO ESB DESIGN APPROVAL AND IS TO BE USED FOR PLANNING PURPOSES ONLY.
2. THIS DRAWING IS TO BE REVIEWED IN CONJUNCTION WITH ALL OTHER RELEVANT INFORMATION.
3. DO NOT SCALE FROM THIS DRAWING. USE ONLY PRINTED DIMENSIONS.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL CHAINAGES , LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
5. THE EXISTING UTILITY SERVICE INFORMATION SHOWN ON THIS PLAN IS A GENERAL GUIDE ONLY AND THE ACCURACY THEREOF CANNOT BE GUARANTEED. NO LIABILITY IS ACCEPTED FOR ANY DISCREPANCY, OMISSION OR DEVIATION AND THE ACTUAL POSITION OF INDIVIDUAL SERVICES MUST BE VERIFIED AND ESTABLISHED ON SITE BEFORE COMMENCING THE WORKS.
6. NO EXCAVATION SHALL COMMENCE UNTIL THE CONTRACTOR HAS CONSULTED UP TO DATE SERVICES DRAWINGS AND CARRIED OUT AN ELECTROMAGNETIC LOCATOR (EML) SCAN.
7. 300MM MIN (HORIZONTAL AND VERTICAL CLEARANCE TO BE MAINTAINED FROM ALL SERVICES AT ALL TIMES, 600MM CLEARANCE REQUIRED FROM HIGH PRESSURE SERVICES.
8. HAND DIG ONLY WITHIN 500MM OF EXISTING SERVICES.
9. ALL CO-ORDINATES ARE REFERENCED TO ITM.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ANY TEMPORARY WORKS REQUIRED.
11. HDD LAUNCH AND RECEPTION PITS LOCATIONS TO BE DETERMINED FOLLOWING SITE INVESTIGATIONS WORKS.
12. FINAL HDD DESIGN TO BE COMPLETED BY SPECIALIST DRILLING CONTRACTOR IN CONJUNCTION WITH THE CABLE DESIGNER.
13. 140MM (OD) SDR 11 HPDE POWER DUCTING AND 125MM (OD) SDR 11 COMMS DUCTING TO BE USED FOR HDD SECTION.
14. TRANSITION COUPLERS/TRANSITION CHAMBER TO BE UTILISED TO TRANSITION TO STANDARD POWER DUCTING AFTER HDD. COMMS DUCTS DO NOT REQUIRE A TRANSITION COUPLER AND WILL BE COUPLED DIRECTLY USING A CHAMFER BETWEEN THE TWO DUCTS.
15. ALL INTERSTITIAL SPACE BETWEEN DUCTS AND BOREHOLE TO BE BENTONITED THOROUGHLY TO MAINTAIN CABLE RATING.
16. THE CONTRACTOR IS TO COMPLETE A COMPREHENSIVE STRUCTURAL SURVEY OF THE BRIDGE IN ADVANCE OF THE BRIDGE CROSSING WORKS COMMENCING. THE STRUCTURAL SURVEY REPORT SHALL BE SUBMITTED TO THE EMPLOYER CONFIRMING THE LONG TERM STRUCTURAL INTEGRITY OF THE STRUCTURE.

REV	DATE	DESCRIPTION	D	C	A
P01.2	27.06.2023	FIRST ISSUE	SMcC	YM	GY

PROJECT No: 20910
STAGE: PLANNING

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PROJECT: TULLACONDRA GREEN ENERGY PROJECT

TITLE: GRID CONNECTION - OPTION 2 CROSSING No. 2B

SCALES @ A1	DRAWN	CHECKED	APPROVED
1:100 1:500	S. McCluskey	Y. Mansoor	G. Young
	DATE 18.06.2023	DATE 21.06.2023	DATE 27.06.2023

SUITABILITY CODE: S3
SUITABILITY DESCRIPTION: REVIEW AND COMMENT

DRAWING No: 20910-NOD-XX-XX-DR-C-08231
REVISION: P01.2

Figure 4.11: Grid Crossing Option 2 - Crossing No. 2B

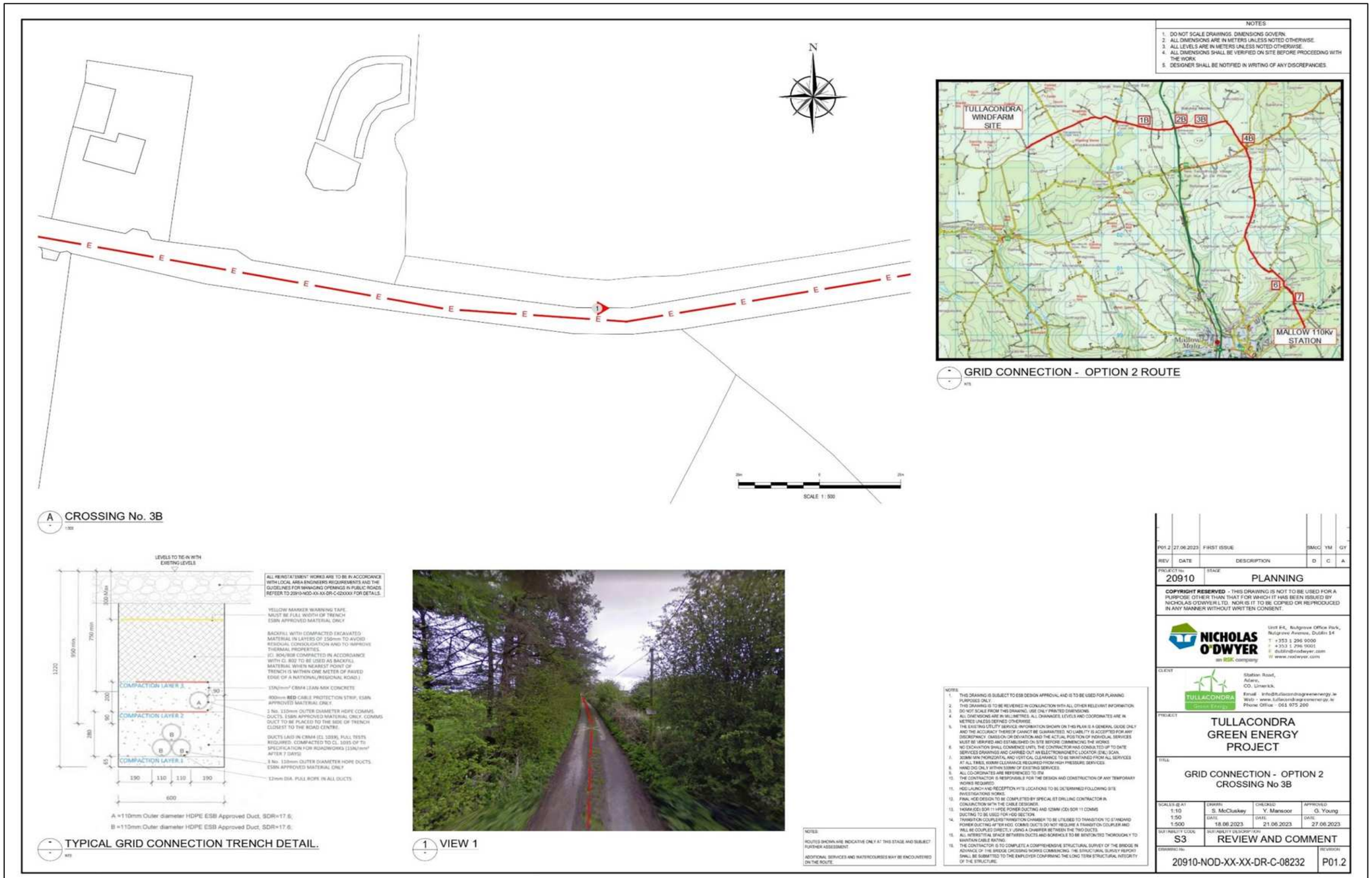

Figure 4.12: Grid Crossing Option 2 - Crossing No. 3B

4.4.8 Alternative turbine delivery routes

Wind turbine components (blades, nacelles and towers) are not manufactured in Ireland and therefore must be imported from overseas and transported overland to a wind farm site. Two options for the delivery of turbine components, originating at Foynes and Ringaskiddy, and proposed temporary accommodating works along each of the two turbine option routes are assessed in this EIAR, but do not form part of the application for planning permission. There is no preferred option for the turbine delivery route for the Project. Either alternative can be implemented.

The alternatives considered for the two route options for delivery of turbine components is described below. An overview of the two options examined is provided in EIAR **Chapter 1 Introduction**, **Figure 1.2**.

4.4.8.1 Port of Entry

The alternatives considered for the port of entry of wind turbines for the proposed development are Foynes Port (Option 1) and Port of Cork at Ringaskiddy (Option 2). With their roll-on roll-off facilities, these ports are established points of entry to Ireland serving wind farms across southern counties. Both ports have been considered for the proposed Project given that they are the closest commercial ports to the Tullacondra wind farm site. Turbine Delivery Route

The proposed turbine delivery route (TDR) options are assessed in EIAR **Chapter 16 Traffic and Transport**. A Turbine Delivery Route Assessment was carried out to identify the optimum delivery route to site for each option. This is presented in EIAR **Volume III**, **Appendix 16.1**.

TDR Option 1 is as follows:

- Loads will depart Foynes Port and travel West-East via the N69 for approximately 30km until it joins the N18.
- Loads will travel south along the N18 for approximately 4km before exiting onto the M20.
- Loads will continue west on the M20 and then join the N20.
- Loads will continue to travel south on the N20 before turning off onto L5523.
- Loads will continue west on the L5523 and L5302 to the proposed site entrance.

TDR Option 2 is as follows:

- Loads will depart Ringaskiddy Port and travel Northeast via the N28 for approximately 12km until it joins the N40.
- Wind Turbine Blade loads will travel East along the N40 for approximately 4km before exiting onto the N8.
- Wind Turbine Blade loads will travel West along the N8 for approximately 2.6km before exiting onto the R635.

- Wind Turbine Blade loads will travel North along the R635 for approximately 5km before exiting onto the N20.
- All other Wind Turbine Loads will travel West along the N40 for approximately 3.5km before exiting onto the N8.
- All other Wind Turbine Loads will travel North through Cork along N8 for less than a kilometre before joining onto the N20.
- Loads will continue to travel North along the N20 for approximately 37km before turning off onto L1200.
- Loads will continue north on the L1200 for approximately 7.5km before turning left onto L5302.
- Loads will continue west on the L5302 to the proposed site entrance.

EIAR **Chapter 16 Traffic and Transport** presents an assessment of the temporary accommodating works required along the TDR option routes. Accommodating works will be carried out in advance of the turbine deliveries, following further consultation and agreement with the Local Authority. The location and details of the accommodation works required are detailed within the Turbine Delivery Route Assessment Report in EIAR **Volume III, Appendix 16.1**.

4.4.9 Alternatives for site access

The proposal is to provide a new temporary entrance along the L5302 approximately 120m east of an existing entrance at Croughta for access to the wind farm during the construction phase only. The existing entrance to the west, which is currently used to access a private dwelling and a farm, is proposed for permanent access to the proposed wind farm during the operational phase. The proposed access arrangement is illustrated in **Figure 4.13**.

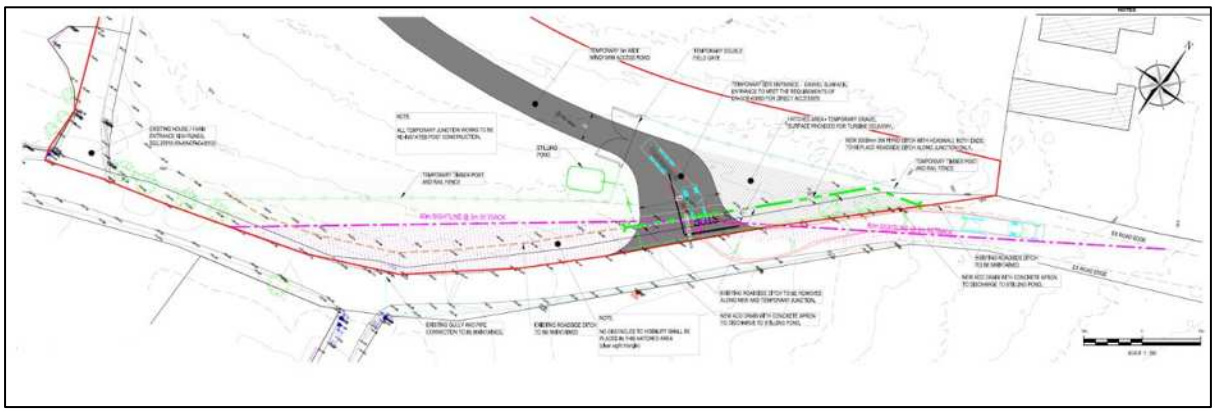

Figure 4.13: Proposed access arrangement for the Project

Several alternatives were considered for access to the proposed wind farm at locations to the north (Option A), east (Option B) and south (Option C) of the wind farm site. The locations of the access options are displayed in **Figure 4.14**.

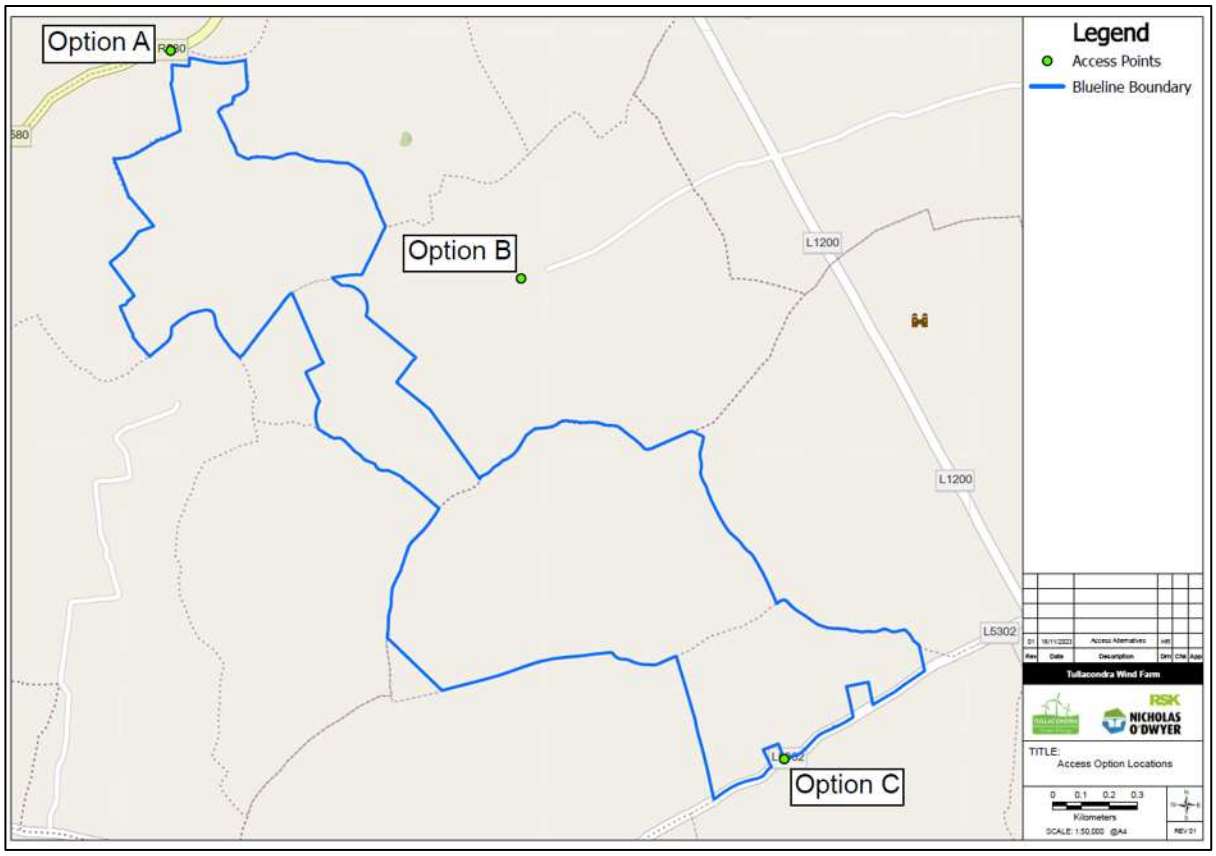

Figure 4.14: Tullacondra access option locations

4.4.9.1 Access A

To the north of the proposed wind farm, the option lands for the Project include access via an unimproved lane with an exit on to the R580 at Castlecor. Refer to **Figure 4.15** and **Figure 4.16**. This access option was eliminated in the early stages of the Project. It is of insufficient width, especially at its junction with the R580, and there are private dwellings, gardens, and boundary walls of properties on both sides of the junction and along the lane.

For the above reasons, Access A was ruled out**.**

Figure 4.15: Aerial view of Access A showing private dwellings along R580 and lane

Figure 4.16: Access A from R580

4.4.9.2 Access B

To the east of the wind farm, there is the L13192 at Ardskeagh. This local road is a narrow public road, suitable mostly for single lane traffic. The road terminates in a farmyard, where spacing between farm buildings does not allow sufficient area for movement of abnormal load vehicles. Access through a busy working farm would cause unacceptable disruption to farming operations and would pose a significant health and safety risk. Refer to **Figure 4.17**.

For the above reasons, Access B was ruled out.

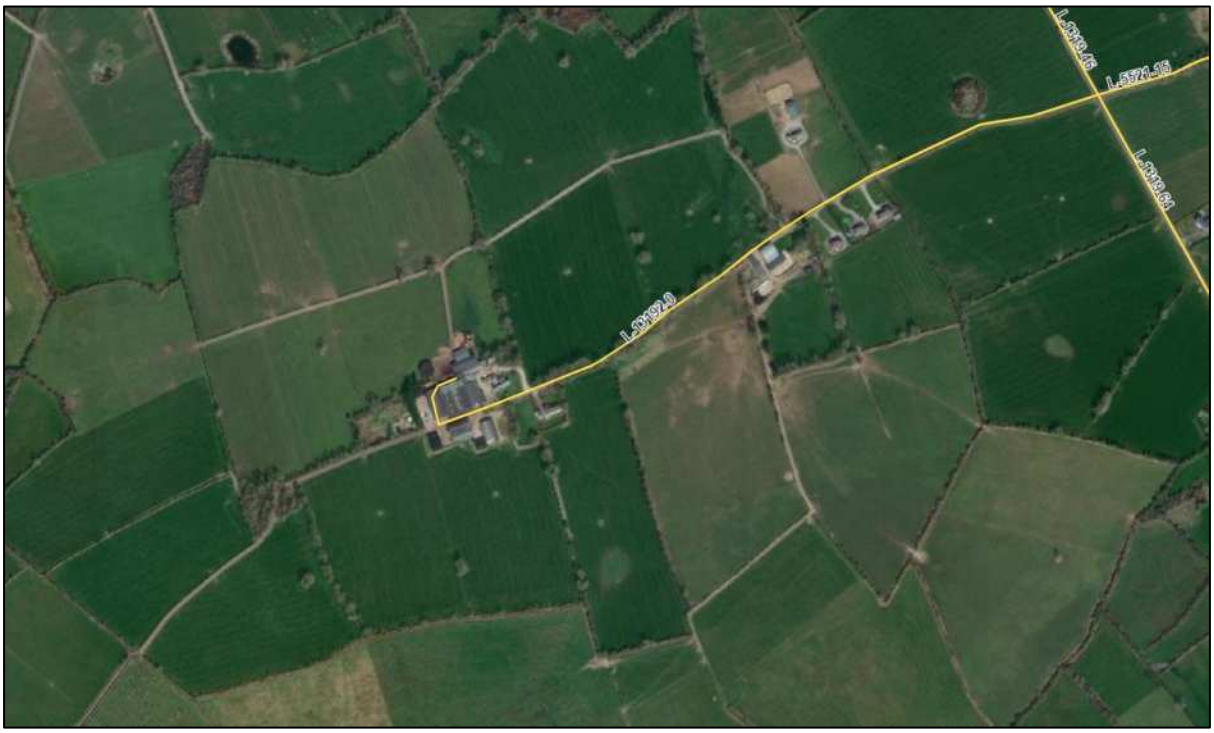

Figure 4.17: Aerial view of Access Option B

4.4.9.3 Access C

Access C along the L5302 was the only remaining viable option to access the proposed wind farm.

At this location there is an existing entrance which is used by motor vehicles to access a private dwelling, and by farm vehicles (tractors, trailers and other farm machinery). The visibility splays at the existing entrance do not currently meet the standard required (*i.e.,* 80m in both directions, 3m back from the edge of the public road).

Photographs of the existing entrance are provided in **Figure 4.18** and **Figure 4.19** below.

Figure 4.18: Existing entrance (Access Location C) looking west

Figure 4.19: Existing entrance (Access Location C) looking east

Three alternatives (1, 2 and 3) were considered at Access Location C. These are now described.

4.4.9.3.1 Alternative 1

Alternative 1 at Access C would use the existing entrance along the L5302 at Croughta for both the construction and operation phases of the proposed development to access the wind farm *via* the existing farm lane. This would require third party land take on the road opposite and significant (temporary) works to the existing junction with the private lane to the south and encroaching upon a farmyard to achieve the turning radius required for delivery of turbine components. This would result in extensive removal of hedgerows and trees along the roadside boundaries on both sides of the road, and for an approximate distance of 172m along the road (south). This is illustrated in **Figure 4.20**.

Apart from the substantial loss of hedgerow and trees along the roadway, and encroachment into the junction with a private lane and farmyard, this alternative poses a safety concern for the family who live along the existing entrance lane. The movement of vehicles for delivery of abnormal loads, road building, concrete and blocks over the estimated 18-month construction period for the wind farm would pose an unacceptable hazard and inconvenience as well as causing detrimental amenity and health impacts to this family by excessive noise and vibration and dust.

In addition, due to the configuration of the existing entrance and slope of the access road, it is not feasible for abnormal load vehicles to utilise this access (even when they have

delivered components and collapsed the trailers), and a low loader for a nacelle, grid transformer, etc. would not make the turn out of the site.

For the reasons set out above, Alternative 1 was ruled out**.**

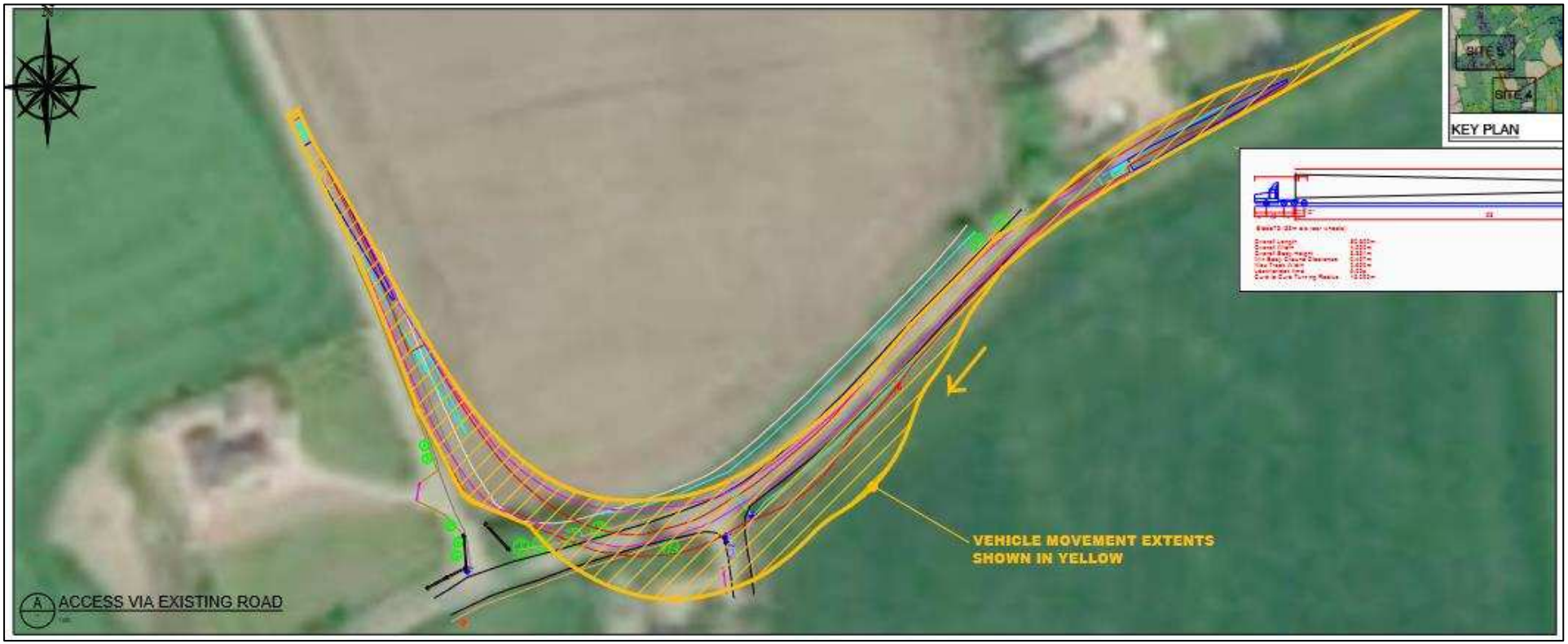

Figure 4.20: Extract map showing Access C, Alternative 1

4.4.9.3.2 Alternative 2

Alternative 2 at Access C is to construct a new temporary entrance to the east of the existing entrance at Croughta, and institute a one-way traffic system whereby vehicles delivering turbine components, road building materials, concrete and blocks would enter only from the east (temporary entrance) and exit only from the west (existing entrance), see **Figure 4.21**.

The temporary entrance and access would be reinstated to agricultural use with covering of topsoil over the access track. Over the lifetime of the Project, this temporary entrance and track would only be called into service to accommodate delivery of replacement turbine components, in the unlikely event that it would be required.

This arrangement would potentially require minimal visibility splays on either side of the junction for the temporary access.

As with Alternative 1, this alternative was ruled out as it would require vehicles leaving the site during the 18-month construction phase to exit *via* the existing entrance causing detrimental amenity impacts and a safety hazard to the private dwelling.

For the reasons set out above, Alternative 2 was ruled out.

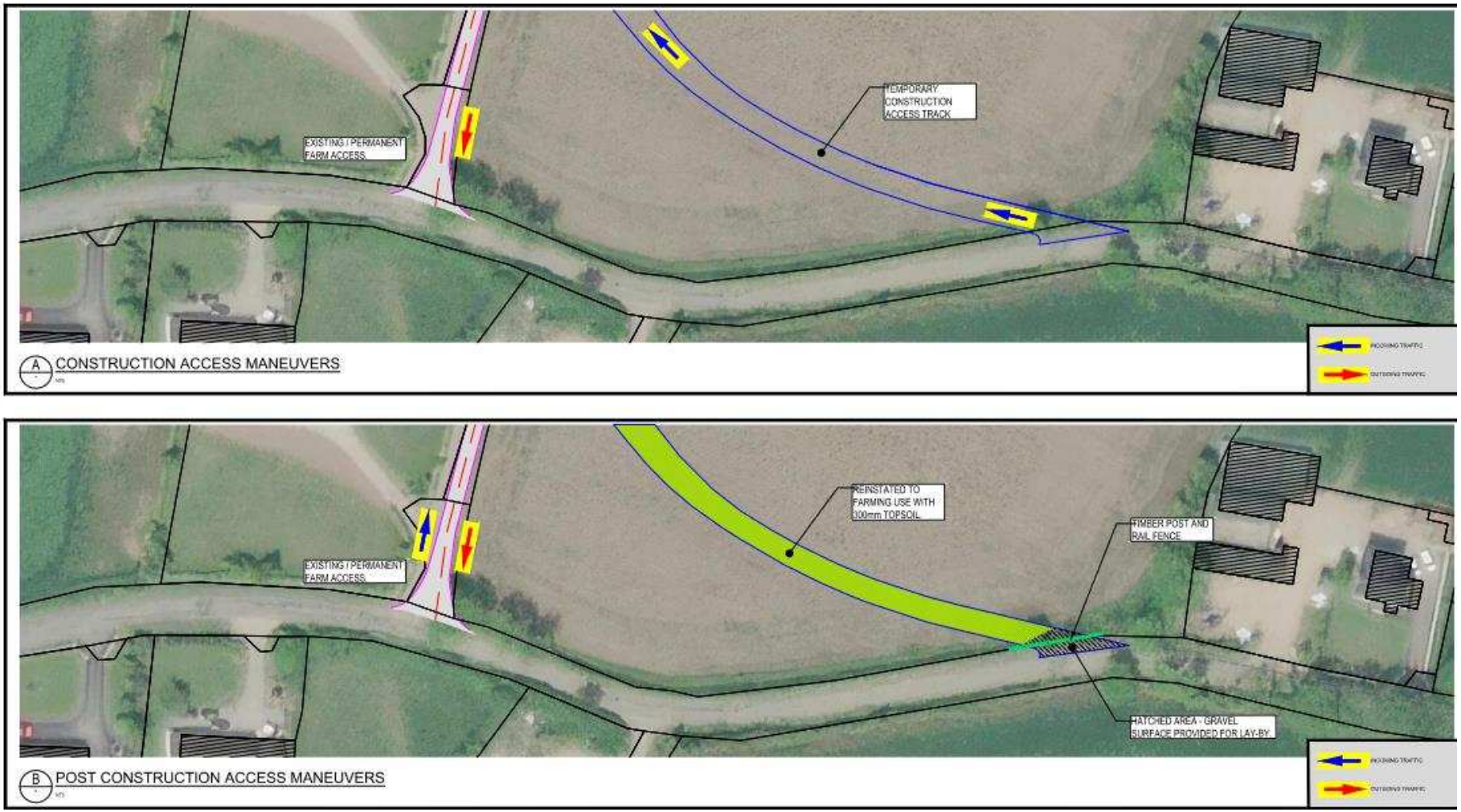

Figure 4.21: Access C, Alternative 2 illustrating a one-way system

4.4.9.3.3 Alternative 3

Alternative 3 at Access C entails creating a temporary entrance east of the existing entrance at Croughta (indicated in grey in **Figure 4.22**). The temporary entrance would provide requisite visibility splays on both sides of the junction with the L5302 to allow for safe movement of vehicles entering and exiting the site in either direction east or west during the construction phase. As with Alternative 2, the temporary entrance and access would be reinstated to agricultural use with covering of topsoil over the access track. Over the lifetime of the Project, this temporary entrance and track may be called into service for replacement of turbine components, in the unlikely event that it is required. With this arrangement, the existing entrance and lane would be used for the operational phase of the Project.

Where this alternative is the safest option and the only remaining viable alternative, it was selected as the preferred alternative.

Figure 4.22: Proposed temporary (grey) and permanent (amber) entrances

4.4.9.4 *The preferred alternative for site access*

The primary concerns with the preferred alternative were to ensure the safety of road users and to protect rural character, features of importance and conserve biodiversity. For this reason, originally it was considered to make no change to the existing entrance since provision of the requisite visibility splays (i.e., 3m x 80m in both directions would result in the loss of trees and hedgerows along with the roadside boundary ditch). Following consultation with the Local Authority, and after having commissioned a specialist tree survey for the roadside boundary encompassing the proposed temporary and permanent accesses, the proposals were modified to include setting back the gates to the existing entrance which will serve as the permanent entrance to the Tullacondra Wind Farm.

A Tree Condition Survey undertaken by Dermot Casey Tree Care on 24th May 2023, identifies the physiological and structural health of a number of trees located at the proposed entrance to the Tullacondra Wind Farm and considers if the trees are a potential risk to persons or property and to provide management work recommendations.

Of the eight trees surveyed (all of which are common ash trees), seven of these are recommended for felling due to their condition (i.e., they are showing signs of ash dieback with poor future prospects (trees. 0656 and 0657), showing signs of decay with the likelihood of becoming infected with ash dieback in the coming months (trees 0659), or are already dead (four trees under 0660). The one remaining tree (0658) is noted as having poor future prospects due to the inevitable spreading of ash dieback to this tree at some point in the future. A copy of the Tree Survey Report is provided as Appendix 2 to the **Planning Report -Section 8** submitted with the planning application.

In relation to loss of biodiversity, following optimised design, the Project will have a significant net gain for biodiversity as demonstrated in Section 4.4.6.6. Any hedgerows and trees removed for the proposed temporary entrance and upgrade of the existing entrance for access to the wind farm site will be reinstated post construction (allowing for suitable sightlines). The substantial offset planting of trees and hedgerows throughout the wind farm site represents a substantial biodiversity net gain for the Project.

The Applicant has provided a Construction Traffic Management Plan (CTMP) with the planning application (EIAR **Chapter 5 Project Description**, **Appendix 5.2**). The purpose of the CTMP is to ensure that the residual effects on the public road network during the construction phase of the Project are minimised and that transport related activities are carried out as safely as possible and with minimum disruption to other road users. The CTMP identifies appropriate and safe methods of access for construction traffic to the Project for the transportation of construction materials, turbine components, equipment, and personnel along the public road network to facilitate the construction of the Project.

In the interest of road safety, which is recognised as being of paramount importance, and considering the substantial biodiversity net gain for the Project overall, it is considered that the preferred alternative for access to the wind farm site, as presented in the proposals for the Project, is justified.

As shown in the site layout plans for the proposed entrances (**Drawing Nos. 20910-NOD-XX-XX-DR-C-08101** and **20910-NOD-XX-XX-DR-C-08102**), these incorporate proposals for the control of surface water drainage at the site entrance.

4.5 Summary and conclusion

The Project is proposed in response to international, European and national policy on sustainable development and climate change. The project supports the enhancement of the competitiveness of rural areas and facilitates the development and diversification of the rural economy by supporting the energy sector and increasing the share of renewables in Ireland's energy mix.

The Project contributes to the nation's target increase of renewable energy from 30% to 70% by 2030 and supports the doubling of onshore wind energy in Ireland by 2030 as set out in the CAP 24.

The project supports national targets of climate mitigation and reduction in greenhouse gas emissions where significant focus has been set out in the recent Climate Action and Low Carbon Development (Amendment) Act 2021. The ambitious Programme for Government is prioritising carbon neutrality and renewable energy generation. In light of this, it is important for the nation to rely on proven technologies such as onshore wind to meet the near-term objectives, as well as the long-term objectives.

The Project promotes the generation of renewable energy at appropriate locations and supports the achievement of a low carbon economy by 2050. It is considered that the Project is in line with national policy and supports the achievement of national renewable energy targets.

Having established the need for the Project, this chapter presented a description of the site selection process undertaken to identify a suitable site for wind energy; and the reasonable alternatives considered throughout all stages of design and development of the Project. This started with modelling to test the feasibility of different turbine models and types in respect of noise and landscape and visual effects. Once the preferred turbine model was selected, assessments commenced to determine a layout for the wind farm site and routes for the grid connection and delivery of turbine components.

Consultation was key in finalising project design. Central to this were members of the public who contacted Tullacondra Green Energy Limited throughout the design process, and attended the Public Exhibition, as well as landowners whose input was sought on the arrangements of the track layout and the location of site infrastructure including the permanent met mast and the substation. The landowners also provided input to the plans for temporary works to ensure minimal disruption to farming operations during construction phase. Extensive consultations via phone calls, meetings and accompanied site visits were held with utility providers, transport authorities, the Cork national roads design office, and the Cork local roads authority to determine solutions for identified pinch points and crossings along the option routes.

Findings from environmental baseline surveys undertaken by the RSK Project Team informed recommendations on construction solutions and mitigation measures to arrive at an optimal project design that meets design objectives, and responds to the constraints posed by the characteristics of the site, its location and the type of development.

In cases where these design objectives could not be fully met, mitigation measures are applied to ensure the design of the Project, following consideration of reasonable alternatives, does not result in significant environmental effects. Each environmental

factor chapter in **Part 2** of the EIAR reports on the impact assessments which informed the design and the mitigation measures as required, to reduce any significant environmental effects of the Project. Beyond mitigation, enhancements are proposed to ensure that the Project respects the environment and achieves a substantial biodiversity net gain.

CONTENTS

TABLES

FIGURES

APPENDICES (EIAR Volume III)

5 PROJECT DESCRIPTION

5.1 Introduction

This chapter provides a description of the Project, which is the subject of the EIAR, comprising a wind farm, two option routes for connecting the wind farm into the national grid, and two option routes for delivery of turbine components from ports of entry to the wind farm site.

The proposed Project includes:

- nine wind turbines with a blade tip height of 175m, rotor diameter of 150m and hub height of 100m.
- turbine foundations and crane pad hardstanding areas and associated drainage.
- upgrade of existing site tracks and construction of new site tracks and associated drainage.
- access from the local public road L5302 at Croughta consisting of a new site entrance for the construction phase and upgrade of an existing entrance for the operational phase.
- an on-site 38kV electrical substation to Electricity Supply Board Networks (ESBN) specification to include control building with electrical infrastructure, welfare facilities supplied by rainwater harvesting and storage tank, a wastewater holding tank, car parking, security fencing and lighting, and all associated infrastructure, services, and site works including a temporary construction compound.
- all associated underground electrical and communications cabling connecting the turbines to the proposed on site electrical substation.
- a temporary construction compound and associated ancillary infrastructure including welfare services, office accommodation, parking, fencing, lighting, etc.
- areas for temporary storage of excavated materials.
- a permanent meteorological mast of 100m height above ground level on a concrete base.
- installation of 38kV underground electrical cabling, mainly within the public road, between the proposed on-site wind farm substation to the Mallow 110kV substation boundary at St. Joseph's Road, Mallow.
- all associated site works, including site clearance, and ancillary development including site drainage, security gates, fencing, permanent and temporary signage, and biodiversity mitigation and enhancements, including hedgerow planting.

The EIAR presents an assessment of two grid connection route (GCR) options (shown in EIAR **Chapter 1 Introduction, Figure 1.1**), and an assessment of temporary accommodating works that will be implemented along two turbine delivery route (TDR)

options from ports of origin in Foynes and Cork for delivery of large components to the wind farm site (shown in EIAR **Chapter 1 Introduction, Figure 1.2**).

Of the GCR options examined in the EIAR, only one route (Option 1) is included in the application for planning permission. The temporary accommodating works for the TDR do not form part of the development for which planning permission is sought. Of the GCR options examined in the EIAR, only one route (Option 1) is included in the application for planning permission.

Further details of the proposed Project, the construction programme and sequencing of works which is used as a basis for assessments in this EIAR is provided in this chapter.

The proposed wind farm is located along the L5302 at Croughta, approximately 2km south of Lisgriffin Cross, Co. Cork. The proposed grid connection includes works in and alongside public roads to install cabling approximately 13.5km to connect the wind farm to the boundary of the Mallow 110kV substation located in St. Joseph's Road, Mallow. The proposed wind farm site and the route of the proposed grid connection for which planning permission is sought (indicated by the red line planning boundary) is shown in **Figure 1.3**, EIAR **Chapter 1 Introduction** and includes a total area of 58.6 hectares (ha).

The site layout plan of the proposed wind farm is shown in EIAR **Chapter 1 Introduction, Figure 1.4.**

5.2 Proposed Project elements

5.2.1 Wind farm

EIAR **Chapter 1 Introduction, Figure 1.4** shows the locations of the proposed wind turbines and associated hardstanding areas including crane pads; the electrical substation; the meteorological mast; the temporary construction compound; the areas for temporary storage of excavated materials; the temporary and permanent internal access tracks and entrances; and biodiversity mitigations and enhancements.

The layout of the proposed wind farm has been designed to minimise potential environmental effects while at the same time maximising the energy yield of the wind resource available at the site. The layout of the wind farm was informed by the following objectives and constraints relevant to project design:

- Maintaining a setback from proposed turbines to inhabited houses of at least 700m (four times the tip height)
- Avoidance of sensitive habitats including non-native invasive species
- Minimising impact on hedgerows
- Capitalising on opportunities for biodiversity enhancements
- Avoidance of known karst features
- Maintaining a buffer of at least 15m from drainage channels where possible and maintenance of a 25m buffer for the historically mapped water feature approximately 90m southwest of the proposed location of T4
- Maintaining a buffer of at least 20m to known archaeological monuments

- Maximising use of existing farm tracks
- Minimising impact on farm operations during construction and operation phases

In cases where these objectives cannot be met, mitigation measures are applied to ensure the Project design, following consideration of reasonable alternatives, does not result in any significant environmental effects. The alternative layouts and locations of ancillary infrastructure considered in the Project design are described in further detail in EIAR **Chapter 4 Project Need and Alternatives Considered**.

5.2.2 The turbines

5.2.2.1 Turbine locations

The Grid Reference coordinates of the proposed turbine locations are provided in **Table 5.1**. Some flexibility in the location of turbines may be required within the criteria set out in the Department of the Environment, Heritage and Local Government's Wind Energy Development Guidelines for Planning Authorities (2006)[1], especially as relates to ground conditions and archaeology (refer to sections 6.6 and 7.3). The red line planning boundary shown in EIAR **Chapter 1 Introduction, Figure 1.4** and on the planning drawings (**Part 2** of the Planning Application Documentation) defines the maximum extent of works required to construct the wind farm infrastructure.

Table 5.1: Proposed wind turbine locations

Turbine ID	ITM Co-ordinates (mOD)		Elevation of top of foundation (mOD)
	Easting	Northing	
T1	547979	606315	118
T2	548351	606226	118
T3	548348	605844	116
T4	548696	605641	112
T5	549083	605614	116
T6	549468	605652	119
T7	548967	605241	127
T8	549331	605146	130
T9	549665	605345	124

5.2.2.2 Turbine details

The proposed turbine model used for assessments in the EIAR is the Vestas V-150, which has the following specifications:

- Three bladed, horizontal axis

[1] Department of the Environment, Heritage and Local Government, 2006. Wind Energy Development Guidelines for Planning Authorities. Government of Ireland.

- Light grey in colour (RAL 7035 – Light Grey)
- Height of 175m from the top of the foundation to blade tip height
- Rotor diameter of 150m
- Hub height of 100m
- Power rating of 4.5MW

The wind turbine front and side elevations are shown on **Drawing No. 20910-NOD-XX-XX-DR-T-18103**.

An aeronautical obstacle warning light scheme will be agreed with the Irish Aviation Authority (IAA) prior to the erection of the turbines, as outlined in the scoping response from the IAA. Refer to EIAR **Chapter 3 Scoping, Consultations, Community Engagement and Key Issues** for details.

5.2.2.3 Power output

The total Maximum Export Capacity (MEC) of the wind farm is approximately 40.5MW. The exact MEC will be dependent on the output power of the turbine model available at procurement stage.

5.2.2.4 Turbine foundations

The location of the turbines was determined in part by the findings of a geophysical survey (as reported in EIAR **Chapter 10 Soils and Geology**, with results presented in EIAR **Volume III, Appendix 10.1**). For the preliminary design and EIAR, traditional gravity-based foundations are considered. These are reinforced concrete structures that depend on their own weight to ensure stability against overturning and sliding. If, based on detailed ground investigation, the ground conditions are unsuitable for gravity-based foundations, then pile foundations will be considered.

Each turbine will be erected on a steel reinforced concrete foundation. The foundations will require excavation and construction bases of approximately 32m in diameter (24m foundation, a 45-degree excavation angle and 1m around for workspace), down to a level where the underlying soil or rock can bear the weight of a structure without shifting or compressing. This will be done by excavating soil, subsoil and rock to a depth which will vary depending on ground conditions at each turbine location. It is estimated that each foundation will have a depth of approximately 3.0m. No crushing or screening of excavated rock material is planned on site. Any rock material broken out and excavated from the site will be taken to a plant off-site via heavy goods vehicles (HGVs) in use on site, where it will be crushed and screened. This processed rock material will then be returned and used on site in site tracks and turbine hardstandings, such that the loss of local geological material from the site is minimised.

The central part of the foundation (plinth) of each turbine will be raised from the main foundation below ground level. It will encompass a cast-in insert or bolts to connect to the bottom of the turbine tower and reinforced bar structural elements. The method of construction for a turbine foundation is described as follows:

- install temporary drainage around the perimeter of the excavation.

- excavate soil and rock
- back fill the foundation with Clause 6N imported stone
- install formwork and reinforcement
- pour the concrete
- once the concrete has set and the earthing system is in place, backfill the foundation with suitable excavated material.

The area around and above the turbine foundation will be backfilled with compacted stone or crushed rock.

5.2.2.5 Hardstanding areas

The turbine hardstands are required to accommodate the delivery, laydown, and assembly of turbine components prior to turbine component lifting and assembly. A plan of the turbine hardstands is shown in **Drawing No. 20910-NOD-XX-XX-DR-C-08104**. Hardstands are needed to support the cranes during turbine construction, operation, and decommissioning phases. The hardstands will be constructed first and used to facilitate construction of the turbine foundations (e.g. steel reinforcement delivery and pouring of concrete).

For each turbine, the hardstand areas include a main crane hardstand, a component set down area, assist crane hardstands, and vehicle parking and turning areas (each with a total combined area of approximately 4,700m^2) as shown in **Drawing No. 20910-NOD-XX-XX-DR-C-08020** to **20910-NOD-XX-XX-DR-C-08028.**

Construction of the hardstanding areas for the turbines will require the excavation of soil, subsoil and rock as required (at an estimated depth of 0.3m), the laying of a geotextile material on the formation surface, and placement of engineered stone and a top dressing. This will create a stable, level, finished working surface of sufficient bearing capacity to carry the required loads.

5.2.2.6 Turbine installation

Once on site, the wind turbine components will follow a detailed route and plan to minimise manoeuvring. Components will be placed on turbine hardstands prior to assembly. Typically, one large main crane will be required for erecting the turbines, assisted by one or two smaller cranes. Depending on the appointed turbine supplier and installation contractor, a second “pre-assembly” crane may be used for lower tower section installation. During the operational phase, cranes may be required in the unlikely event that turbine components require replacement.

The towers will be delivered in sections, and work on assembly will be undertaken only under suitable weather conditions. Turbine assembly will be in accordance with turbine supplier requirements and will follow the general sequence described below.

Turbine pre-installation

1. The base section and typically one mid-section will be pre-installed with a 500-750t crane and a 130t-assist crane.

2. The blades will be unloaded using two mobile cranes placed on the hardstand allowing the required outreach to place blades in the blade laydown area. The blade laydown area needs to be flat, free of obstacles and within the lifting radius of the main crane. The nacelle will be delivered using a standard flatbed trailer or a clamp/world adapter trailer. The nacelle will be unloaded using a mobile crane and placed within the main crane working radius in such a position that it does not interfere with the later build and operation of the main crane.
3. The hub will be unloaded with a mobile crane and placed within main crane working radius.
4. The remaining tower sections will be unloaded onto the hardstand allowing space for the main crane to mobilise into position to complete assembly of the turbine.

Turbine main installation

Once the base tower has been erected, and the nacelle, blades and hub have been prepared, then the main crane will be brought to the crane pad.

1. The main crane will be placed at a required working radius from the centre of the foundation and assembled.
2. Once assembled the main crane will commence the erection of the tower sections in combination with a mobile tailing crane. The tower transports need an appropriate free area within the main crane and tailing crane working radius. Additional lifts for the bolts will be necessary before the next tower section is lifted.
3. The nacelle will then be lifted from the position on the pad where it has been prepared, the hub will then follow. Depending on the crane configuration and the hub height it may be that the nacelle is lifted without the drivetrain/powertrain inside, which will then be a separate lift.
4. The blades will be the last to be lifted from the location where they have been prepared.
5. The crane is disassembled and moved to the next location.

It will take approximately 1.5 weeks for each turbine to be erected, and a period of approximately two months for commissioning and testing of wind farm before it is fully operational.

5.2.3 Wind farm site access

5.2.3.1 Temporary entrance

A new temporary construction entrance will be created along the L5302 local public road at Croughta approximately 120m east of an existing entrance which serves a dwelling and farmlands of a landowner associated with the Project. The temporary entrance will be used for the duration of the 18-month construction phase for delivery of turbine components and all building materials (e.g., aggregates for access tracks, concrete for foundations, crane pads and hardstanding areas, substation building foundations and building materials, etc.). This temporary entrance with its gate and fencing will be removed and the boundary along the public road at this location will be reinstated following completion of the construction phase. The temporary entrance will be culverted

across the roadside drain, and measures will be put in place to ensure no runoff from the access lane flows onto the public road. The access track will be reinstated with a covering of topsoil and returned to agricultural use. Over the lifetime of the Project, this temporary entrance and track will only be called into service to accommodate delivery of replacement turbine components requiring abnormal loads (e.g., blade, nacelle, tower), in the unlikely event that it would be required.

5.2.3.2 Permanent entrance

The existing entrance from the L5302 at Croughta, which is currently used for access to a dwelling and farmlands of a landowner associated with the Project, will be used as the access for operational phase of the proposed wind farm. Currently, this entrance is in use by motor vehicles/vans and large farm vehicles (tractors, trailers, articulated lorries, etc.).

Visits to the wind farm, once operational, are anticipated to be minimal as both the wind farm and substation will be operated remotely. Periodic visits will be related to maintenance works. In the interest of road safety, provision will be made for upgrading this entrance to provide visibility splays measuring 80m on both sides of the entrance set back 3m from the edge of the public road. Upgrading this entrance to provide for the required visibility splays requires the removal of gate piers, a stone wall and several trees along the L5302. If required, the culvert across the roadside drain at the entrance will be upgraded, and measures will be put in place to ensure no drainage from the entrance or access lane flows onto the public road.

5.2.3.3 Signage

The Construction Traffic Management Plan (CTMP), provided in EIAR **Volume III, Appendix 5.2**, outlines that it will be the responsibility of the appointed contractor to undertake consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements during the construction phase. Warning signage will be posted at the site entrance directing all visitors to the site manager. Signs will be erected to warn public road users of the works access / egress locations and the presence of construction traffic. All signage will be provided in accordance with the Department of Transport's Traffic Signs Manual, Chapter 8 – Temporary Traffic Measures and Signs for Roadworks (2019)[2] and will be installed prior to works commencing on site.

For the operation phase, clear signage relating to the development will be provided near to the substation area. Access to the wind farm site will be restricted to the turbine operator, associated service teams and the farmer only.

5.2.4 Site tracks

5.2.4.1 New tracks

Wind farm access tracks will consist of approximately 4.5km of permanent access tracks and 2km of temporary access tracks. The tracks will be approximately 5m in width. All access tracks will require excavation of approximately 300mm of existing ground and will

[2] Department of Transport, 2019. Chapter 8 – Temporary Traffic Measures and Signs for Roadworks. Traffic Signs Manual.

be constructed to approximately similar finished ground level. The finished access tracks will be crushed fill surfaced using locally sourced materials.

5.2.4.2 Upgrade of existing site tracks

Most existing site tracks will not be suitable for use by construction traffic. If required, where existing tracks coincide with new track positions, they will be excavated and re-constructed. The first 500m of existing site track from the public road entrance is of good quality and may be upgraded and widened to suit the Project needs; in which case, traffic movements, noise and other impacts will be lessened.

5.2.5 Site drainage

5.2.5.1 Existing drainage features

The wind farm site is characterised generally by a network of historical drainage, and historical features, non-mapped natural and artificial drainage channels, and some connections to groundwater southwest of the wind farm site. Many of the drains are "dry drains" that contain no water for much of the year.

Drainage channels identified during desk studies and site surveys are presented in EIAR **Chapter 9 Hydrology and Hydrogeology**, **Figure 9.6a** (wind farm site) and **Figure 9.6b** (GCR 1 & 2). Photographs of hydrological features on the wind farm site are presented in **EIAR Volume III, Appendix 9.3**.

Drainage channels are mapped using four categories:

1. Historically Mapped Surface Water (25-inch maps located on GeoHive. Not mapped by Environmental Protection Agency (EPA)/ Water Framework Directive (WFD).
2. Primary Drainage (main artery of drains on site)
3. Secondary Drainage (connections to primary drains)
4. Tertiary Drainage (connections to secondary drains)

There are 12 existing watercourse crossings (culverts), which will form part of the Project drainage network. Existing surface water crossings associated with surface water features and primary drainage features are also identified and are presented as part of the constraints mapping in EIAR **Chapter 9 Hydrology and Hydrogeology**, **Figure 9.17**. In some places in the wind farm site, drainage ditches mapped from onsite surveys do not correspond / line up with Environmental Protection Agency (EPA) and Water Framework Directive (WFD) mapping of river subbasins. Some field boundaries do not have drains.

Drainage channels at the wind farm site quickly drain the fields with the exception of some localised surface water ponding and 'perched' standing water in some areas (i.e., local-scale pluvial flooding). Particular areas of the wind farm site with perched surface water or 'wet' conditions include the general area to the north / northwest of Turbine T1, and the area in the south of Turbine T8 adjacent to existing farm building. These can be described as 'wet' or 'marshy' ground. A primary drain flows towards and is connected to

a mapped lake ID:18_58, as shown in EIAR **Chapter 9 Hydrology and Hydrogeology**, **Figure 9.17b**.

A historically mapped surface water feature was identified in the Ordnance Survey Ireland (OSi) 6" Cassini map, and forms part of one of the main drainage channels in the wind farm site. This feature is mapped as 'rising' or beginning approximately 90m southwest of the location of Turbine T4.

The drainage network is associated with the Lisduggan River Basin catchment, which appears to combine into the historically mapped surface water feature and recharges to ground approximately 1.3km downstream.

5.2.5.2 Drainage design principles

Constructed drainage will be provided to manage runoff from tracks, hardstanding areas, and storage areas for excavated materials. This will minimise the potential for silt runoff during construction and operation. The Project drainage design uses the principles of Sustainable Drainage, promoting on-site retention of flows and the use of buffers and other silt removal techniques. All drainage-related mitigation measures will form part of a robust Sustainable Drainage System (SuDS) on the wind farm site.

The final detailed drainage design for the wind farm will minimise modification and disruption of the existing hydrology. SuDS features have been designed in accordance with best practice guidance in the SuDS Manual (2015)[3]. The design principles are summarised below.

- The collection of surface water runoff from upgradient of the development footprint – greenfield areas, via clean water interceptor drains and the buffered redistribution of clean runoff downgradient of the development footprint by means of culverts and outfalls to vegetated areas to maintain or improve the hydrological regime at the site.
- The collection of surface water runoff from the footprint of the development i.e., the construction area (dirty water drains), and management of potentially contaminated runoff in the constructed treatment train**.** Where possible, the buffered outfalls from the treatment train (stilling ponds), will be redistributed to maintain or improve the hydrological regime at the site.
- Where drainage networks exist, collected / diverted runoff will likely be diverted back into the existing network. In such instances, it is important to include the existing drainage network in designing and specifying the treatment train and attenuation features, including improving, modifying, and constructing attenuation features in drainage channels. Similar considerations for newly constructed drainage channels, and the modification and/or improvements of existing drainage will be designed to maintain or improve the hydrological regime at the site.
- Maintaining or improving the hydrological regime at the site will assist in achieving the objectives of the development Surface Water Management Plan (SWMP) (i.e., mitigating against potential adverse effects to the hydrological response to

[3] CIRIA, 2015. The SuDS Manual (C753).

rainfall at the site (related to flood risk), and water quality in the receiving surface water network). Refer to EIAR **Volume III, Appendix 5.1** for the SWMP.

5.2.5.3 Preliminary drainage design

There are no new watercourse crossings over mapped streams or rivers included as part of the proposed wind farm development. Existing crossings are associated with existing farm access tracks, some of which will require upgrading. A number of new watercourse crossings are associated with the proposed new site tracks. This will involve the removal of existing culverts and replacement with culverts of a size and length appropriate to the location and width of the access track. These culverts are indicated on **Drawing Nos. 20910-NOD-XX-XX-DR-C-08005** to **20910-NOD-XX-XX-DR-C-08010**.

Berms with a dirty water drain are proposed on either side of the temporary and permanent access tracks and around the turbine hardstands. These will be located so that sediments will be collected at check dams along the proposed drains before being rerouted towards stilling ponds or the existing drainage system. Refer to **Drawings No. 20910-NOD-XX-XX-DR-C-08307** and **20910-NOD-XX-XX-DR-C-08104** for details on the proposed drainage and trackside berms.

5.2.6 Materials requirements for project elements

The materials that are required to construct the proposed Project that require to be imported to site, along with estimated quantities and the anticipated sources of those materials are listed in **Table 5.2**.

Table 5.2: Materials requirements to construct the proposed Project

Materials	Quantity	Source of Materials
Concrete	6,742 m^3 / 1,595 loads	Off-site concrete plants as identified in EIAR **Chapter 16 Traffic and Transport**
Aggregate (crushed stone)	31,351m^3 / 2,412 loads	Off-site quarries as identified in EIAR **Chapter 16 Traffic and Transport**
Surface dressing (public road sections)	2,800m^3 / 216 loads	Off-site plants as identified in EIAR **Chapter 16 Traffic and Transport**
Turbine Towers (5 sections per tower)	55 abnormal wide and long loads	EU
Turbine Nacelle	11 abnormal wide loads	EU
Turbine Blades	33 abnormal wide and long loads	EU
Reinforcing Steel	160 loads	Various Irish Suppliers
Main Transformers	3 loads	EU
Electrical Cabling, Communications Cabling	6 loads	EU

Materials	Quantity	Source of Materials
Switchgear, Electrical Equipment, Apparatus and Plant	8 loads	EU
Pre-cast concrete Joint Bay, Communications and Link Box Chambers and Covers	12 loads	Off-site plants as identified in EIAR **Chapter 16 Traffic and Transport**
HDPE Ducting	9 loads	Ireland – presently Cork
Red Cable Protection Strip and Yellow Warning Tape	1 load	Ireland - presently Cork
Steel protection plate	2 loads (if required)	Ireland - presently Birr, Co Offaly
Marker posts and plates	2 loads	Ireland - presently Dundrum, Co Dublin
General building materials	15 loads	Various Irish Suppliers
Fencing materials, posts, rails, wire	45 loads	Local Hardware

5.2.6.1 Management of earth materials

As reported in EIAR **Chapter 10 Soils and Geology**, with results presented in EIAR **Volume III, Appendix 10.1**, resistivity surveys undertaken at the wind farm site indicate a low depth to bedrock in the vicinity of T7. This will require the use of a rock breaker for excavation to the required depth and will give rise to approximately 530m^3 (40 loads) of sandstone which will be taken off-site for crushing and returned to site for re-use for access tracks and turbine hardstandings.

All other earth material excavated from the site will be reserved in temporary storage areas and used in site re-instatement as far as possible (refer to section 5.2.8.3).

5.2.7 On-site electrical and communications components

5.2.7.1 Substation

A 38kV electrical control substation will be located near the entrance to the wind farm in the vicinity of an existing farm shed as shown on **Drawing No. 20910-NOD-XX-XX-DR-C-08003**. The electricity from the turbines will be cabled into the substation where it will be transformed, metered and regulated for export to the national electricity system. The final layout and design of the substation will be to ESBN specifications.

The final layout and design of the substation will be to ESBN specifications. The proposed substation contains the following:

- Independent power producer (IPP) control room
- ESB control room
- Switch room
- Storeroom

- Office
- A water connection system supplied by rainwater harvesting with storage, to supply the proposed Water Closet (WC) and wash hand basin. Potable water will be supplied by bottled water or water cooler
- A WC with connection to a sealed wastewater holding tank fitted with a high-level alarm
- Diesel tank (bunded to 110% volume capacity) and generator
- Transformer bund and associated infrastructure (busbars, circuit breakers, cable supports and cabling)
- Lighting and fencing (2.6m palisade fencing or as specified by grid operator)
- Parking for 5 vehicles.

A temporary construction compound area will be located adjacent to the substation and is detailed in section 5.2.9.1.

The substation will be connected to the existing Mallow 110kV substation via underground cabling over approximately 13.5km, mainly within public roads.

5.2.7.2 Site Underground Cabling

All power, communication and control cabling on the wind farm will be installed underground in excavated trenches which will be routed from the wind turbines to the substation along the path of site access tracks where possible (approximately 5.3km of cabling in total). When trench excavation works commence, the surface vegetated topsoil will be removed from the trench path and reserved adjacent to the trench. The excavated cable trenches will be approximately 600mm wide and 1000mm deep. The cable ducting will be placed into the prepared trench and inspected prior to backfilling. Excavated material will be employed to backfill the trench and the reserved vegetated topsoil will be used to reinstate it to finished ground level. Any surplus material from excavation of the trenches will be used as berms along the access tracks or deposited in one of the designated storage locations. Cable ducts will have warning tape buried below the finished ground level. Cable ducts will have warning tape buried below the finished ground level.

5.2.7.3 Permanent meteorological mast

For wind farms with an MEC exceeding 10MW, it is a grid operator requirement to have continuous on-site meteorological monitoring during operation. This is essential in providing high-quality forecasting now and into the future to maintain system security.

A 100m Meteorological Mast (met mast) is proposed at the wind farm site to supply continuous, real-time wind speed, wind direction, air temperature and air pressure data. The number and heights of the instruments to be affixed to the met mast will be agreed with the grid operator during detailed design.

The proposed met mast will be located central to the wind farm site, midway between Turbine T4 and T5, as shown on layout drawings **Drawing No. 20910-NOD-XX-XX-DR-C-08004** and **Drawing No. 20910-NOD-XX-XX-DR-C-08009**. The proposed met mast

will be a free-standing lattice type structure as shown in **Drawing No. 20910-NOD-XX-XX-DR-C-08105**. It will be accessed via a short section of track from the internal access track. A turning head will be constructed adjacent the mast site.

The met mast foundation will be approximately 8m x 8m and the mast will be affixed to a concrete plinth with a depth of 3m. The plinth will be designed and constructed similarly to the turbine foundations. It will encompass a cast-in insert or bolts to connect to the bottom of the met mast and reinforced bar structural elements. The area around and above the foundation will be backfilled with compacted crushed rock. The met mast will be linked to the closest turbine via underground internal cabling for power and communication.

5.2.8 Temporary works

5.2.8.1 Construction compound - substation

A construction compound area will be located to the rear of the substation (refer to **Drawing No. 20910-NOD-XX-XX-DR-E-04211)**. It will include:

- Storage areas for equipment/materials
- Drying room
- Meeting room and offices for site staff
- Toilet block (and associated enclosed wastewater storage tank)
- Canteen
- Fuel tank and diesel generator
- Parking for at least 12 vehicles.

The compound will be constructed by removing the topsoil layer and laying a base of geotextile matting with hardcore material on top. On completion of the construction phase, temporary facilities will be removed and the ground within the contractor's compound will be reinstated with landscaped topsoil.

5.2.8.2 Construction compound – wind farm

A construction compound for the wind farm is proposed in the southern portion of the site split in two areas alongside the access tracks in the vicinity of Turbine T9. The compound will contain temporary facilities including site offices and meeting rooms, a drying room, canteen area, storage areas, skips, a bunded refuelling area (with a Class 1 full retention oil interceptor), and a generator for compound electrics. The compound will include pedestrian barriers for safety. The overall compound area will measure approximately 1,650m^2). Staff and visitor parking will be provided in the compound area and will include parking for at least 15 vehicles. See **Drawing No. 20910-NOD-XX-XX-DR-C-08106** for compound and parking area plans and details. The compounds will be constructed on a base, stripped of topsoil, where geotextile matting will be laid at ground level with hardcore material on top.

The construction phase sanitation will consist of temporary welfare unit(s) that are self-contained and will be serviced regularly. All wastewaters will be collected in an enclosed holding tank and removed from site on a regular basis for final wastewater treatment by

a licensed contractor. The source of a water supply will be non-potable water for the site office and service area which will be delivered and stored on site for use in the welfare facilities. Potable water will be supplied by bottled water or water cooler.

On completion of the construction phase, temporary facilities will be removed and the ground within the compound will be reinstated with landscaped topsoil.

5.2.8.3 Storage areas for excavated materials

The handling, management and re-use of excavated materials are of importance during the construction phase of the Project. It is envisaged that material excavated to construct all infrastructure elements of the wind farm (foundations, tracks, hardstands, etc.) will be used as backfill and for site reinstatement. Of the total quantity of materials to be excavated for construction of the Project, approximately 8% will be stored in the vicinity of Turbine T1, 8% near Turbine T2, 10% near Turbine T3, 24% near Turbine T4, 9% near Turbine T6, 8% near Turbine T8, 11% near Turbine T9, 9% near the construction compound, 6% near the substation and 7% near the site entrance. The locations of the temporary storage areas is shown on **Drawing No. 20910-NOD-XX-XX-DR-C-08003**. Further details on spoil management can be found in the Spoil Management Plan contained within the Construction Environmental Management Plan (CEMP) in EIAR **Volume III, Appendix 5.1**.

Table 5.3 provides a summary of estimates of earth material to be excavated for the wind farm site. Any earthen (sod) banks to be excavated will be carefully removed and stored separately for use in site reinstatement. Every effort will be made to ensure materials excavated for construction of the wind farm infrastructure will be re-used on site. Should excavations result in surplus material, the material will be managed in accordance with the relevant waste management legislation. Further details on waste management can be found in the Resource and Waste Management Plan contained within the CEMP in EIAR **Volume III, Appendix 5.1**.

Table 5.3: Summary of estimated excavations for construction – wind farm site

Material	Generated with bulking factor (m^3)	Reused on site (m^3)	Imported to site (m^3)	Balance of material (m^3)
Topsoil	56,278	56,063	0	215
Subsoil	39,154	38,722	0	432
Aggregate/rock on site	530	530	0	0
Aggregate imported	0	0	31,351	31,351
Concrete	0	0	6,742	6,742
Sand	0	0	118	118

Note: it is assumed that the remainder of subsoil and topsoil material will be used in landscaping.

The material excavated for the construction of new access tracks and upgrade of existing access tracks in the wind farm site will be placed in berms alongside the tracks and/or stockpiled in designated temporary storage areas (at a height not exceeding 1.5m for

topsoil or 2m for subsoil). The temporary storage areas are proposed at Turbines T1, T2, T3, T4, T6, T8, and T9, and at the construction compound, substation and site entrance. Trackside berms will be a trapezoidal with a tapered trapezoidal berm to blend with existing field levels of maximum height 0.6m. Refer to **Drawing No. 20910-NOD-XX-DR-C-08307** for details on the proposed drainage ditch and trackside berms.

For the installation of cabling for the grid connection, any earthen (sod) banks will be carefully removed and stored separately, maintained and used during reinstatement. Surplus excavated material from these works will be reused if suitable or managed in accordance with the relevant waste management legislation. Further details on waste management can be found in the Resource and Waste Management Plan contained within the CEMP in EIAR **Volume III, Appendix 5.1**.

5.2.8.4 Turbine and construction materials delivery route

Wind turbine components (e.g., turbine blades, towers, nacelles, hubs), and steel reinforcement, stone and concrete, cables, and other construction materials and electrical components will be brought into the site using the local public roads in the region (L1200, L5523, L5302).

A high level engineering assessment of two option routes to bring turbine components to the wind from site from ports of entry at either Foynes, Limerick or Ringaskiddy, Cork is presented in **Chapter 4 Project Need and Alternatives Considered**. EIAR **Chapter 16 Traffic and Transport** presents an assessment of two TDR options. The Turbine Delivery Route Assessment Report is provided in EIAR **Volume III, Appendix 16.1**. The TDR options have been assessed with respect to safety of all public road users. Public road safety improvement measures during construction phase may include hedge cutting, signage and the construction of temporary passing bays in consultation with Cork County Roads Authority. The traffic management measures proposed for the Project are outlined in the CTMP provided in EIAR **Volume III, Appendix 5.2**.

5.2.9 Grid connection

Tullacondra Green Energy Limited proposes to connect into the Mallow 110kV substation at St. Joseph's Road, Mallow. The grid connection from the wind farm site to the boundary of the substation will be via a 38kV cable which will be underground and constructed primarily within the existing public road corridor over a distance of approximately 13.5km. The design of the grid connection and connection into the Mallow 110kV substation will comply with grid operator specifications and technical and operational requirements.

As the Mallow 110kV substation is a live station, ESB Network (ESBN) safety rules will apply from the substation boundary. ESBN will be responsible for the routing of the grid connection cable through the Mallow 110kV substation compound and the connection to one of the existing cable bays within the substation. The works anticipated would include laying a trench from the substation switchgear building to the substation boundary where it will connect to the GCR for the Project. The EIAR presents an assessment of the potential effects from the grid connection within the Mallow 110kV substation. However, these works do not form part of the development for which planning permission is sought and will be subject to a separate planning application.

An engineering assessment has been undertaken on the proposed GCR options as displayed on EIAR **Chapter 1 Introduction, Figure 1.1**. This assessment included field survey and engagement with the Cork County Roads Authority the Cork National Roads Office, Transport Infrastructure Ireland, Gas Networks Ireland, and Iarnród Éireann to determine the best engineering solution for crossings of National Roads, bridges and watercourses. **Table 5.4** provides a summary of the grid connection crossing points and proposed solutions for GCR Option 1, the preferred solution which is included in the application for planning permission. **Table 5.5** provides a summary of the crossing points and proposed solutions for GCR Option 2, up to the point where it meets Option 1 route, which is the same.

Table 5.4: Option 1 grid connection crossing points and proposed solutions

Crossing Point	Drawing Ref. (refer to planning pack)	Location	Description	Proposed Construction Solution
1	20910-NOD-XX-XX-DR-C-08210	L1205-19 at Ballykitt, Mallow	Existing cattle underpass	From examination of the layout plan (Drg. 103 PL1) and section (Drg. 105 PL1) drawings on the planning file (County Cork P. A. Reg. Ref. 216326) and measurements undertaken in the field, it has been determined that there is sufficient cover over the underpass for installation of the grid cable within the road at this crossing.
2	20910-NOD-XX-XX-DR-C-08211	L1205-01 at Greenvale, Ballybeg, Twopothouse, Mallow	Under railway bridge	From measurements undertaken in the field it has been determined that there is sufficient height between the bridge archway and road level (4.29m) and width (6.2m) for undertaking grid installation works under the bridge, within the public road, at this location.
3	20910-NOD-XX-XX-DR-C-08212	L1205-01 at Greenvale, Ballybeg, Twopothouse, Mallow	Crossing interface with gas mains	Following consultation with Gas Networks Ireland, it has been determined that the gas mains is 2.4m depth below the level of the road. Grid ducting will be laid in trefoil to a depth of 1.25m which will provide cover of 1.15m to the depth of the gas line.
4	20910-NOD-XX-	L1205-01 at New	Crossing the N20	Horizontal Directional Drilling (HDD) is proposed for crossing under the N20.

Crossing Point	Drawing Ref. (refer to planning pack)	Location	Description	Proposed Construction Solution
	XX-DR-C-08213	Twopothouse Village		A launch pit will be constructed within the L 1205-01 public road approximately 20m before the junction with the N20. The reception pit will be located approximately 8m from the N20 in Council lands in front of Tower B & B.
5	20910-NOD-XX-XX-DR-C-08214	Junction R581 with L1207 at Hazelwood, Old Twopothouse Crossroads	Crossing interface with water lines	Open cut trenching is proposed at this location following proactive engagement with the Local Authority and Irish Water. A traffic management lane closure operation will be required along the R581 on the left-hand side of the road heading in an easterly direction. To cross the road, a 4- way traffic management system will need to be in place. There are existing Irish Water utilities on the Hazelwood junction road that will be required to be crossed and in compliance with Irish Water Standards. Based on desktop and field surveys, there is sufficient room on the left-hand side of the L1207 road heading in a southerly direction beside an existing 150cm diameter watermain which is installed in the road verge. Based on desktop and field surveys, there is sufficient space in the left hand lane to install the new ducts with a lane closure only required under a controlled traffic management system.
6	20910-NOD-XX-XX-DR-C-08215	L5320 at Ballyviniter Upper	Within Ballyviniter Bridge	It is proposed to cross the existing Ballyviniter Bridge along the L5320 via Open Cut trenching. The trench will be constructed on the right hand side of the road heading in a southerly direction and crossing the

Crossing Point	Drawing Ref. (refer to planning pack)	Location	Description	Proposed Construction Solution
				bridge in the existing grass verge. There is an existing water service in the verge that may have to be diverted if still live. The trench will be constructed with minimal cover and a structural concrete slab as cover to ensure protection will be required for the new service. There is sufficient space available to replace the grass verge with a concrete finish which will not affect the road layout. Extensive discussions have taken place with the Local Authority on this proposed crossing.
7	20910-NOD-XX-XX-DR-C-08216	L5320 at Ballyviniter Lower, Spa Glen, Mallow	Crossing watercourse	HDD is proposed for crossing under a watercourse (Blackwater (Munster_140) – also locally known as Caherduggan South) at this location. A launch pit will be constructed within the L53320 public road approximately 18m before the junction with the N72. The reception pit will be located approximately 6m from the N72 in the carriageway of a former public road now in part private ownership

Table 5.5: Option 2 grid connection crossing points and proposed solutions

Crossing Point	Location	Description	Proposed Construction Solution
1B	L5523 at Ballybeg	Crossing railway line and gas transmission line	As well as crossing a gas transmission line, HDD is proposed for crossing under the railway line. A launch pit will be constructed within the L5523 public road approximately 25m before the junction and the railway bridge. The reception pit will be located approximately 7m from the end of the railway bridge in the public road. This will be subject to agreement with Irish Rail, the local authority, and ESBN. Alternatively, the launch and reception pits will be located in third party lands adjacent to the railway bridge. This is illustrated in **Figure 4.10** in EIAR **Chapter 4 Project Need and Alternatives Considered**.
2B	L5523 and N20 at Boherash Cross	Crossing N20	HDD will be required for crossing under the N20. A launch pit will be constructed within the L5523 public road approximately 25m before the junction with the N20. The reception pit will be located approximately 7m from the N20 on L5568 in Council lands. This is illustrated in **Figure 4.11** in EIAR **Chapter 4 Project Need and Alternatives Considered**.
3B	L5568	Narrow local road	Open cut trenching will be required at this location following proactive engagement with the Local Authority and Irish Water. A traffic management full lane closure operation with a rolling basis will be required along the L5568. This is illustrated in **Figure 4.12** in EIAR **Chapter 4 Project Need and Alternatives Considered**.

The grid connection cabling will be installed in trenches (c.1.25m deep and 0.6m wide), which will be laid with five cable ducts through which the three electrical cables, communications cables, and copper earthing cables (if required) will be pulled. The ducts will be laid in accordance with ESBN standards, on bedding sand and then surrounded by concrete, red cable protection strip and yellow warning tape and steel protective plates, if required at the location, will be placed in the trench before the top of the trench is backfilled and reinstated.

In areas where a watercourse or national highway must be crossed, HDD crossing will be utilised with a launch and reception pit on either side of the crossing. The HDD crossing is proposed in 2 locations in GCR Option 1 (crossing with N20 (**20910-NOD-XX-XX-DR-C-8213**) and crossing with Blackwater (Munster)_140 (also locally known as Caherduggan South) and the N72 (**20910-NOD-XX-XX-DR-C-8216**). HDD crossing is proposed in 3 locations in GCR Option 2 (crossing with railway line and gas transmission line, crossing with N20 and crossing with narrow local road).

With HDD, small quantities of greases known as 'drilling fluids' are commonly used during the drilling process to keep components of the drill rig cool and lubricated. These drilling fluids are composed of a mixture of bentonite clay, which can be harmful to the environment. Drilling fluids such as Clearbore, which is an environmentally friendly, High-Performance Water-Based Mud suitable for tunnelling and drilling operations, or fluids with similar environmental properties will be used in drilling operations.

Where the proposed grid connection cable route encounters minor culverts, the ducts will be installed above or below the culvert depending on its depth in accordance with construction methodologies outlined in the CEMP) contained in EIAR **Volume III, Appendix 5.1**. The cable ducting will be installed so as not to impact the existing culvert.

The cables will be pulled through the ducts and joined together at joint bays located along the route. The joint bay comprises three underground pre-cast concrete chambers – a joint bay chamber (4.5m long, 2.03m wide and 0.96m deep), along with two smaller communication link box chambers. Cable pulling, jointing and testing will be carried out at the start and end point and at each joint bay. Once the cables have been jointed and commissioned, the entry and exit and joint bay chamber will be filled with sand and a concrete cover fitted on top. Joint bays within the public road will be reinstated in accordance with Transport infrastructure Ireland (TII) specifications and will be agreed with the local authority.

A man-hole type cover will be fitted over the start and end points of the grid connection cable route. Over-ground identification marker posts and marker plates will be installed along the route. The manhole covers at link boxes and comms chambers and marker plates/posts will be the only surface expression of the cabling when works are completed.

Table 5.6 provides a summary of estimates of the amount of earth material to be excavated for the grid cable installation works within the public road. Every effort will be made to ensure materials excavated for the works will be re-used. Where excavations result in surplus material, the material will be managed in accordance with the relevant waste management legislation.

Table 5.6: Summary of estimated excavations for GCR Construction within public roads

Material	Generated with bulking factor (m^3)	Reused on site (m^3)	Imported to site (m^3)	Balance of material (m^3)
Topsoil	3,391	0	0	3,391
Subsoil	10,604	4,860	0	5,744
Concrete	0	0	4,455	4,455

5.2.10 Proposed biodiversity enhancements

In accordance with ecological best practice and the requirement under Objective BE 15-6 of the Cork County Development Plan 2022 – 2028[4] to achieve a net gain for biodiversity, Tullacondra Green Energy Limited proposes mitigation and enhancements for biodiversity for the proposed Project. The Habitat Management (HMP) provided in EIAR **Volume III, Appendix 7.3** presents the proposals for biodiversity offsetting and enhancement and demonstrates a positive and proactive commitment to achieving biodiversity net gain for the proposed Project.

The HMP proposes features and management prescriptions to offset habitat loss or alteration resulting from the Project and to further enhance the site and/or adjacent land for ecological features and deliver long-term benefits. Proposed features and management prescriptions include:

- Woodland planting and enhancement
- Dry meadow creation
- Wet grassland management
- Hedgerow and tree planting and enhancement
- Field margin development
- Scrub planting and enhancement
- Pond enhancement
- Species shelter habitat creation;
- Invasive non-native species (INNS) management; and
- Bat mitigation.

The HMP outlines the objectives and targets of the enhancement plan along with prescriptions for management and monitoring. The above features are described in full in the HMP and illustrated in the Biodiversity Enhancement Map (EIAR **Chapter 7 Biodiversity, Figure 7.6**). Of these features and management prescriptions, the works required for pond enhancement are considered development within the meaning of the Planning and Development Act 2000 (as amended) and are included in the red line

[4] Cork County Council. 2022. Cork County Development Plan 2022-2028.

planning boundary. The remainder of the measures outlined in the HMP are land management prescriptions for areas lying within the blueline boundary.

As stated in section 7 of the HMP, the specified management prescriptions under each management feature will be carried out by the wind farm operator in conjunction with the relevant landowners (taking account of any conditions or requirements arising during the planning process) for which agreement to these prescriptions has been secured as part of the final lease legal agreement and associated letters of consent for the making of the planning application.

5.2.11 Community benefit fund

Upon a grant of planning permission, and subject to a successful Renewable Electricity Support Scheme (RESS) auction, Tullacondra Green Energy Limited will provide a Community Benefit Fund, in line with the Department of the Environment, Climate and Communications Good Practice Principles Handbook for Community Benefit Funds (July 2021)[5] . These guidelines outline that a Community Benefit Fund should have a strategic focus, in line with county or local development strategies and the United Nations Sustainable Development Goals (UN SDGs). In the unlikely event that the company does not secure a RESS agreement, it will commit to a voluntary community benefit scheme. Based on the MEC of the proposed wind farm, the Project has the potential to generate a CBF estimated at €3.75 million over the first 15 years of the Project.

5.2.11.1 Fund Allocation

The Community Benefit Fund, estimated in the region of €250,000 per annum, will be allocated in accordance with RESS guidelines. A worked example is shown in **Table 5.7**.

Table 5.7: Worked example of allocation of community fund

Description	% of Fund	Annual Amount
Initiatives and projects that support Sustainable Development Goals within the local area	40%	€100,000
Local clubs, societies and near neighbours	50%	€125,000 shared between those closest to the Project and the balance will be allocated to local clubs, societies and near neighbours within 2km of a turbine.
Administration	10%	€25,000
TOTAL	**100%**	**€250,000**

Note: The above is a typical example and subject to change based on final Project details.

[5] Department of the Environment, Climate and Communications, 2021. Good Practice Principles Handbook for Community Benefit Funds Under the Renewable Electricity Support Scheme. Government of Ireland.

Examples of how the Community Benefit Fund could be used within the local area are provided in **Table 5.8**.

Table 5.8: Examples of eligible projects under the Community Benefit Fund

Quality Education	Technology for Schools	Affordable, clean energy generation
Community Project Ideas: • Upskilling programmes for the community • Scholarship opportunities • Sustainable development training	Community Project Ideas: • Free teaching and learning resources • Technical and vocational skills • Supporting young people to gain employment opportunities	Community Project Ideas: • LED lighting for community facilities • Community Solar Farms • Renewable electricity sources • Energy upgrade for the retrofit of homes

5.2.11.2 Administration of the Community Benefit Fund

A collaborative process for the Tullacondra Community Benefit Fund will be formed between the Project developer and members of the local community. The Project team will reach out to residents within the 2km area and then further afield to encompass residents of the wider community. The aim is to bring together a group of people who are interested in working on the strategy and structure of a committee that would take the lead in running the Tullacondra Community Benefit Fund.

The committee will be provided with training in the form of facilitated workshops. It is envisaged that members of existing local development groups, clubs and societies will be stakeholders and contribute their knowledge and energy to the committee. Administration of the CBF will be in accordance with good practice principles and guidance from the Department and the Sustainable Energy Authority of Ireland (SEAI).

5.3 Construction of the Project

5.3.1 Environmental management of construction activities

5.3.1.1 Construction Environmental Management Plan

A CEMP has been prepared for the Project and is included in EIAR **Volume III, Appendix 5.1 of** this EIAR. The CEMP is a suite of documents that set out the key environmental management measures for construction phase of the Project, to ensure protection of the environment. It also sets out management measures that will continue into the operational and decommissioning phases. The CEMP includes the following documents:

- Surface Water Management Plan
- Spoil Management Plan
- Summary of Mitigation Measures
- Resource and Waste Management Plan
- Water Quality Management Plan

- Emergency Response Plan

A separate CTMP has been prepared and is included in EIAR **Volume III, Appendix 5.2** of this EIAR.

The final CEMP and CTMP will be developed further upon planning approval, to address the requirements of any relevant planning conditions, including additional mitigation measures which may be conditioned.

An Environmental Manager / Ecological Clerk of Works (ECoW) with appropriate experience will be appointed for the duration of the construction phase to oversee implementation of the CEMP. The following sections describe key activities which, if unmitigated, may result in environmental pollution or cause harm or nuisance to the public.

5.3.1.2 Refuelling

Refuelling of vehicles will be carried out off site to the greatest practical extent. Due to the remote location nature of the wind farm site, it is unlikely that implementation of this refuelling policy will be practical in all circumstances (e.g., excavators, cranes, etc.). In instances where refuelling of vehicles on site is unavoidable, a designated and controlled refuelling area will be established at the site. The designated refuelling area will be bunded to 110% volume capacity of fuels stored at the site. The designated refuelling area will be located a minimum distance of 50m from any surface water or site drainage features. The bunded area will be drained by an oil interceptor that will be controlled by a penstock valve that will be opened to discharge storm water from the bund depending on the quality of the water. Management and maintenance of the oil interceptor and associated drainage will be carried out by a suitably licensed contractor on a regular basis. For large machinery such as cranes, a drip tray will be used, and spill kits and fuel absorbent pads will be on hand. Suitable storage for contaminated materials will be provided pending offsite removal of contaminated material.

5.3.1.3 Concrete management

Ready-mixed concrete will be used during the construction phase for elements of the construction works on site including turbine and met mast foundations, and substation plinths and footpaths. Elements of the substation will utilise precast concrete, including hollow core slabs for ceilings. The joint bays to be installed during the grid connection works will be pre-cast and will be delivered and transported using lowbed trailer trucks.

All ready-mix concrete will be delivered from local batching plants in sealed concrete delivery trucks, as required. Following completion of concrete pours, only the chute of the delivery truck will be cleaned in a dedicated bunded area within the construction compound using the smallest volume of water necessary, before leaving the site. Concrete trucks will exit the site and return to the supply plant to wash out the mixer itself.

The concrete pours at the turbine locations will be planned in advance. Proposed mitigation measures as detailed in EIAR **Chapter 9 Hydrology and Hydrogeology** are summarised as follows:

- Using weather forecasting to assist in planning large concrete pours, and avoiding large pours where prolonged periods of heavy rain is forecast.

- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets.
- Only the chutes will be cleaned prior to departure from site, and this will take place at a designated area at the temporary construction compound. The contents will be allowed to settle, and the supernatant will be removed off site by a licenced contractor.

5.3.1.4 Dust suppression

In periods of extended dry weather, dust suppression may be required to ensure dust does not cause a nuisance. If necessary, damping down of site compounds will be undertaken to prevent the generation of dust.

To reduce mud and debris from getting onto the local public road network, a wheel wash facility will be employed at exiting points on-site which will wash mud and debris from vehicles egressing the site. The location of the wheel wash facility is indicated on **Drawing No. 20910-NOD-XX-XX-DR-C-08005**.

5.3.1.5 Traffic management

A prudent approach will be taken to planning the entirety of the works for construction of the Project to ensure minimal impacts on public road users and the general public. Traffic management at the wind farm site will be coordinated by an appointed Traffic Manager for the duration of the construction phase of the Project in accordance with the CTMP.

The RSK Project Team have assessed two route options for the delivery of turbine components from either Foynes Port or Ringaskiddy, including temporary works that may be required for the deliveries and pinch points along the routes where temporary accommodation works may be required (e.g., cutting back vegetation, installing temporary hardcore surfaces, removing fencing, signs and street furniture, etc.).

A pre-condition survey will be carried out on all public roads that will be used in connection with the development to record the condition of the public roads in advance of construction commencing. A post construction survey will also be carried out after the works are completed. All roads will be reinstated in a timely manner upon completion of the construction works.

Letter drops will be carried out to notify members of the public living near the proposed works to advise them of any particular upcoming traffic related matters. Clear signage relating to the development, both temporary and permanent, will be provided for accessing the site. The entrances to the site will be secured when the site is not in use. When necessary, a flagman will be used to assist traffic movements at the site entrance or in other areas as required.

For the grid connection installation, cable trenching will be carried out with the aid of either lane closures or road closures, which will ensure that the trenching works are completed as expeditiously as possible. The works to install the cable ducting within the public road corridor will be conducted over a period of approximately twenty weeks. Road closures will be subject to the applicable statutory processes as implemented by the Cork County Council Roads Authority. ‘Rolling road closures’ will be implemented, whereby the works will progress each day along a road, which will have the effect of reducing the

impact for local residents. Temporary diversions may be required, and local access will be maintained at all times for residents, farms and businesses, and restrictions during school drop off and collection times, where applicable.

A traffic management plan for the cable trenching works will be adopted, in consultation with Roads Authority, to ensure a safe environment for public road users and construction workers.

Turbine delivery will require the transportation of abnormal loads. This will be undertaken at off-peak times under agreement with the local authority and An Garda Síochána and in accordance with an Abnormal Load Permit.

A CTMP has been prepared for the Project and is presented in EIAR **Volume III, Appendix 5.2**. In the event planning permission is granted for the Project, the final CTMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which may be conditioned.

The CTMP will include:

- A delivery schedule
- Details of works or any other minor alteration identified
- A dry run of the route using vehicles with similar dimensions

5.3.1.6 Spoil management

Any soil excavated for the construction of access tracks within the site will be re-used on site in berms and for landscaping purposes associated with the HMP (EIAR **Volume III, Appendix 7.3**) and along the margins of the access tracks.

Berms will be created from suitable excavated material and located outside the trackside drains which drain the access tracks. Further details related to management of soil during the construction phase can be found in EIAR **Chapter 10 Soils and Geology** and within the CEMP in EIAR **Volume III, Appendix 5.1**.

Spoil arisings during construction works will be stored at a height not exceeding 1.5m for topsoil or 2m for subsoil. Temporary stockpile areas were selected taking account of the local topography and will be managed in terms of potential for solids entrainment by runoff, by the use of silt screens. These temporary spoil mounds will have side slopes battered back to a safe angle of repose and will be covered in plastic sheeting during periods where works have temporarily ceased (e.g. weekends / overnight) and ahead of heavy rainfall / storm alerts.

Following completion of construction, all plant and machinery will be removed from the site. The temporary works/assembly areas needed for the construction period will be reinstated using the original spoil material removed and stockpiled close to the location from where it was excavated as explained in EIAR **Chapter 7 Biodiversity** and EIAR **Chapter 10 Soils and Geology**.

Further details on spoil management can be found in EIAR **Chapter 10 Soils and Geology** and the Spoil Management Plan contained within the CEMP in EIAR **Volume III, Appendix 5.1**. The purpose of the Spoil Management Plan is to keep earthworks and earth movement at the site to a minimum and, if possible, reuse and avoid removing any

soils / subsoils and rock from the site. This approach provides for the sustainable use of materials and minimises adverse impacts to habitats, watercourses and the landscape as a result of the construction of the Project. It also assists in reducing the carbon footprint of the Project. The earthworks proposals in the Spoil Management Plan will consider and mitigate all identified significant risks to environmental receptors. The Spoil Management Plan will be subject to detailed review following the completion of site investigations and in advance of wind farm construction. The management measures contained in the Spoil Management Plan will be expanded to reflect any requirements associated with a future grant of planning permission, and requirements of the site contractor/manager, turbine manufacturer and the ECoW.

5.3.1.7 Waste management

A Resource and Waste Management Plan (RWMP) has been prepared for the Project and is presented in the CEMP contained in EIAR **Volume III, Appendix 5.1.** The RWMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each phase of construction of the Project. Disposal of waste will be a last resort.

The developer, in conjunction with appointed contractor, will reduce, reuse and recover as much of the waste generated on site as practicable and ensure the appropriate transport and disposal of residual waste off site to licensed facilities. This is in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended, and circular economy principles.

Prior to the commencement of the development, a construction Waste Manager will be appointed by the contractor. The role of the Waste Manager will be to record, oversee and manage everyday handling of waste on the site. The Waste Manager or delegate will record the following:

- Waste taken for reuse off-site
- Waste taken for recycling
- Waste taken for disposal
- Reclaimed waste materials brought on-site for reuse.

Wastewater from the staff welfare facilities will be collected in a sealed storage tank. All wastewaters will be tankered off-site by a licensed contractor to a wastewater treatment plant.

5.3.2 Monitoring

Please refer to the CEMP which sets out a programme of monitoring required for the construction phase of the Project. A summary of the key information is provided below.

5.3.2.1 Wind farm site

- The baseline monitoring undertaken at the wind farm site will be repeated periodically before, during and after the construction phase to monitor any deviations from baseline water quality that occur at the site.
- There will be daily inspection of silt traps, buffered outfalls and drainage channels.

- Works areas will be monitored daily for evidence of groundwater seepage, which presents as water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process.
- The works areas and adjacent receiving drainage systems will be monitored daily for evidence of erosion and other adverse effects to natural drainage channels and existing degraded areas whereby soils/subsoils are exposed and prone to enhanced degradation.
- Watercourse crossings will be inspected daily to check the structural integrity.
- A Geotechnical Clerk of Works will be employed during the construction phase to monitor excavation activities at all works areas, to verify that safety standards are being met and to monitor for any potential stability issues, particularly in areas of deeper excavations, and areas with the potential to encounter weathered limestone or karst features.
- All major sub-surface groundworks associated with the Project (as identified in EIAR **Chapter 15 Archaeology and Cultural Heritage**), buffer zones will be fenced off and will be subject to a programme of archaeological monitoring.

5.3.2.2 Grid connection route

- Monitoring will be carried out at each significant construction location along the GCR (at HDD crossings and where there is excavation >2.0m) and at the following environmental monitoring locations;
    - Upstream and downstream of surface water crossings on mapped rivers. Monitoring proposed will be specified relative to the particular activity and associated risk at respective locations.
    - Dewatering excavation points within buffer zones (mapped wells, source protection areas, and/or associated Regionally Important Karst Aquifer). Monitoring proposed will be specified relative to the particular activity and associated risk at respective locations.
    - Monitoring proposed will be specified relative to the particular activity and associated risk at respective locations.
    - At construction areas requiring drilling (HDD) and/or significant excavations (launch pits, cable joint bays), and in the management of general excavations, arisings will be managed carefully with a view to containing and treating all drained water and runoff which will likely be laden with suspended solids. Active continuous monitoring will be required at these locations. The monitoring location will be at the outfall or discharge point of the treatment train at any respective location.

5.3.2.3 All works

- Dust deposition, dust flux, or real-time PM10 continuous monitoring locations and duration (including baseline monitoring) with the Local Authority.

5.3.3 Proposed construction schedule

It is anticipated that the construction of the Project will take approximately 18 months, excluding testing and commissioning of the wind turbines. An indicative construction programme is presented in **Figure 5.1**.

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Mobilisation and site setup																		
Site Clearance, Tree Felling and Fencing																		
Internal Access Tracks and Drainage																		
Turbine Hard Standings																		
Turbine / Metmast Foundation																		
Onsite Substation																		
On-site Cable Installation																		
Grid Route cable works (off site section only)																		
Turbine / Metmast Installation																		
Energisation, Commissioning & Testing																		
Biodiversity Enhancement																		
Landscaping, Fencing, Reinstatement, Demobilisation																		

Figure 5.1: Indicative construction programme

Working hours for construction will generally be from 07:00 to 19:00 on weekdays, with reduced working hours from 08:00 to 14:00 on a Saturday. It may be necessary to commence turbine base concrete pours earlier due to time constraints incurred by the concrete curing process and avoidance of busy traffic times. Similarly, earlier working hours may be required in the case of turbine assembly to allow works within suitable weather conditions. Turbine component deliveries will generally be during early morning, under license and subject to Garda escort.

5.4 Operation of the Project

During the operation phase, the wind turbines will operate automatically, responding to changes in wind speed and direction as measured by the anemometry equipment. The wind turbines will be connected via electrical and communications cables, and data will be relayed from the wind turbines to an off-site control centre which will operate 24 hours per day, 7 days per week. The off-site control centre will monitor turbine output, performance, wind speeds, and will respond to any key alarms.

The Project is expected to have a lifespan of approximately 35 years. Planning permission is sought for a 35-year operation period commencing from the date of commissioning of the full wind farm.

5.4.1 Maintenance

The turbines will be subject to a routine preventative maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance which could include resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The electricity substation components and site tracks will also require periodic maintenance. The impacts associated with traffic volumes for this period are assessed in EIAR **Chapter 16 Traffic and Transport**.

5.4.2 Monitoring

Please refer to the CEMP which sets out monitoring requirements for the operational phase of the Project. A summary of the key information is provided below;

- Bat boxes, rocket boxes and tubes to be monitored from installation to years 1, 2, 3, 5, 10, 20, 30, 34.
- A fatality monitoring programme for birds and bats will be implemented during operation of the Project and will take place within the first three years of operation and subsequently in years 5, 7, 10, 15, 20, 25 and 30 as part of the curtailment monitoring schedule. This monitoring will involve monthly searches of carcasses within monitoring years (January-December), during periods when bats are most active (between March-October), and within the wintering and breeding seasons for birds. For most habitat management prescriptions in the HMP (EIAR **Volume III, Appendix 7.3**) monitoring is proposed within the first three years of operation and then subsequently in years 5, 7, 10, 15, 20, 25, 30 and 35.

- Watercourse crossings will be inspected frequently (*i.e.*, weekly/monthly inspections initially and reduced gradually in line with observed stability and confidence in longer term data obtained) to check structural integrity.
- Monitoring at baseline surface water monitoring locations will continue into the operational phase until stable conditions are observed (e.g., in line with baseline conditions for a continuous period of 6 months).
- The stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the site initially, and gradually reduced based on observed stability of conditions.

5.5 Decommissioning of the proposed wind energy project

At the end of its operational life, the Project will be decommissioned as assessed in this EIAR. Prior to decommissioning, Tullacondra Green Energy Limited may make an application to extend the life of the wind farm or repower it, however this would be subject to an entirely new planning application. Decommissioning of the wind farm elements will involve the complete removal of above ground components. Cranes will be used to disassemble each turbine section and they will be removed from the site. The upper sections of the foundations projecting above ground will be removed, and the remainder of the foundations will be covered by soils typical of the surrounding environment and then reseeded or left to re-vegetate according to ecological requirements. Leaving the turbine foundations in-situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental nuisances such as noise, vibration and dust. Underground cables will be cut back at the turbine termination points and will be recycled. It is proposed that site access tracks will remain to allow access through the site for farm access, as considered appropriate at the time. Decommissioning the proposed development will take approximately 2 months to complete. Details of decommissioning will be agreed with the local authority prior to any decommissioning taking place.

5.5.1 Use of the site following development and decommissioning

The land on which the turbines will be located is agricultural land for tillage and grazing. Following development, the hardstands and crane pads will be grassed over, and the internal access tracks will be utilised to access farmlands. Provision has been made in the design of the internal access tracks for replacement of turbine components in the event it is required. It is envisaged that the land will continue to be used for farming throughout the lifetime of the Project, including following decommissioning.

5.6 Vulnerability of the Project to risk of major accidents and/or disasters

As required by Annex IV (5) of the EU EIA Directive, the potential for the Project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is addressed in this section. Potential vulnerability of the Project to risk of major accidents and/or disasters as relevant to the Project arise in relation to flooding; major incidents involving dangerous or hazardous substances;

pollution from hydrocarbons, chemicals and wastes; fire; and catastrophic events including land subsidence.

5.6.1 Risk of flooding

The risk of flooding during construction and operation is addressed in EIAR **Chapter 9 Hydrology and Hydrogeology**, and in the Flood Risk Assessment contained in EIAR **Volume III, Appendix 9.5**. The assessments conclude that the Project complies with the appropriate policy guidelines for the area and is at no risk of flooding.

In the event of extreme weather conditions, the proposed surface water drainage will manage storm water avoiding significant adverse effects on the Project's infrastructure. Mitigation measures are set out in EIAR **Chapter 9 Hydrology and Hydrogeology** to avoid potential negative effects during the construction phase with respect to flood risk.

5.6.2 Risk of major incidents involving dangerous or hazardous substances

The proposed wind farm is not located in the vicinity of a Major Accidents Hazard (COMAH) site as designated under the Seveso-III-Directive (2012/18/EU). Upper Tier and Lower Tier sites listed by the Health and Safety Authority under the Seveso Directive that are relevant to the Project are sites at Cork Harbour (Ringaskiddy) (pharmaceutical and plants) and Foynes Port (fuel terminals) which are the ports of origin considered in the proposed TDR options in the EIAR. Given the unlikelihood of the Project being exposed to such an event, the vulnerability of the Project to risk of major accidents caused by these designated sites is low.

5.6.3 Risk of pollution from hydrocarbons, chemicals and wastes

During the construction phase, the activities with potential to cause significant environmental pollution and associated adverse effects on human health and the environment include the bulk storage of hydrocarbons, chemicals, and wastes. Potential risks arise from the release of pollutants into watercourses, which could negatively impact upon aquatic habitats and species. Mitigation measures are set out in EIAR **Chapter 9 Hydrology and Hydrogeology** to avoid potential adverse effects during the construction phase with respect to pollution risk.

5.6.4 Risk of fire

An Emergency Response Plan (ERP) for the construction and operational phase of the Project will include emergency response procedures for initial actions in the event of incidents such as fire. Records will be kept for testing of fire alarms and drills and maintenance/inspection of fixed and portable firefighting equipment. Information will be provided to employees on fire safety and fire prevention, including risks of and control measures to prevent fire outbreak, evacuation procedures and those responsible for their implementation, and the use of firefighting equipment, in line with guidance published by the Health and Safety Authority.

The turbines will be fitted with fire detection equipment that will shut the turbine down in the event of smoke being detected. Each turbine will be equipped with an electrical grounding system to provide grounding in the case of a lightning strike. As the proposed wind farm will be remotely monitored, potential accidents will be quickly identified and

reported. Furthermore, the substation building will conform to the relevant fire safety regulations. The risk of fire is considered to be low.

5.6.5 Risk of catastrophic events

Potential catastrophic events associated with operational wind turbines include wind turbine toppling (due to foundation or tower failure) and wind turbine rotational failure in extreme wind conditions (due to control system or rotor brake failure).

The separation distances of turbines from public roads and residences are sufficient to ensure that buildings and infrastructure is at low risk of significant accidents. Turbine T9 is the turbine nearest to an occupied dwelling (approximately 715m) and nearest to the on-site substation is (approximately 417m). Turbines have been sited with consideration for existing ground conditions. Areas mapped by GSI as potential karst and confirmed by 2D resistivity surveys have been avoided. Slopes and surficial geology and location of watercourses and land drains has been taken into consideration for design of access tracks and hardstanding alignments, cutting and filling, and selecting sites for temporary storage of excavated material and drainage.

Rigorous regular safety checks will be conducted on the turbines during operation to ensure the risks posed to staff, landowners and the general public remain low. Wind turbines are fitted with sophisticated remote monitoring and control systems to manage rotational speed. Turbines also have the capability to shut down in storm conditions through adjustment of blade pitch. Turbines are also fitted with emergency power supply units to provide backup power in the event of a loss of mains power supply that could impact the control system.

5.6.6 Conclusion

On the basis of the Project location in respect of designated Seveso sites, careful siting and design to avoid potential hazards, and mitigation measures recommended in the EIAR to reduce or eliminate risks of flooding, pollution, fire, and catastrophic events, the potential for the proposed Project to cause risks to human health, cultural heritage or the environment are negligible.

In line with the Irish Wind Energy Association (IWEA) (now Wind Energy Ireland) Health and Safety Guidelines for the Onshore Wind Industry (2011)[6], an ERP for construction and operational phases will be prepared for the Project. As set out in these guidelines, the ERP will include among other items required as a minimum:

- details of potential hazards and emergency situations that the emergency services may encounter.
- details and locations of significant hazards (e.g., high-voltage equipment).
- details and locations of nearby installations that may assist in an emergency.

An outline ERP for construction phase is provided in the CEMP provided in EIAR **Volume III, Appendix 5.1**.

[6] Health and Safety Guidelines for the Onshore Wind Industry on the Island of Ireland, IWEA, 2011, http://www.iwea.ie/contentfiles/Onshore%20Wind%20Guidelines.pdf, accessed 13/06/2023.

EIAR Volume II

Main Report

Chapter 6: Population and Human Health

CONTENTS

TABLES

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6 POPULATION AND HUMAN HEALTH

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) for the proposed Tullacondra Green Energy Project ('the Project') identifies likely significant effects which are likely to occur as a result of the construction, operational and decommissioning phases of the Project on the population in the area together with the effects of the Project on human health.

The Project includes the construction, operation and decommissioning of a wind energy development consisting of nine wind turbine generators with foundations and crane pad hardstanding areas; a permanent meteorological mast; an on-site 38kV substation, underground cabling connecting the turbines to the on-site substation; and underground grid connection to the boundary of the Mallow 110kV substation; along with all associated site works including site clearance, temporary compounds and storage areas; a new temporary entrance and upgrade of an existing entrance; upgrade of existing site tracks and construction of new site tracks; site drainage; and ancillary developments including security gates and fencing, lighting and signage; and biodiversity mitigations and enhancements. This chapter includes an assessment of the likely significant effects from both Grid Connection Route (GCR) Options and both Turbine Delivery Routes (TDR) Options.

The site layout plan of the proposed wind farm is shown in **Figure 1.4**, in EIAR **Chapter 1 Introduction**. Further details of the Project, the construction programme and sequencing of works which are used as the basis for assessments in this EIAR are provided in **Chapter 5 Project Description**.

6.2 Statement of authority

This chapter was prepared by Laurie McGee, Associate Director with RSK Environment. Laurie is a corporate member of the Irish Planning Institute and the Royal Town Planning Institute and has over 30 years of experience in town and environmental planning consultancy in Ireland, the UK and the USA. Laurie has considerable experience in onshore wind energy EIA and planning, having worked on multiple wind farms in Northern Ireland and Northwest Ireland including preparation of Population and Human Health chapters.

Harry Reynolds, Graduate Environmental Consultant from Nicholas O'Dwyer assisted with preparation of this EIAR chapter, including conducting desktop research for the description of the baseline and updates to the database of potential sensitive receptors and preparing the figures for this chapter. Harry has a Bachelor of Science (Hons) in Environmental Science from Atlantic Technological University, Sligo. In 2022, he won the Academic Excellence award for the highest overall marks in his department, and the ESAI Undergraduate of the year award for his thesis titled 'The Utilization of Wildflower Pollen as an Environmental Indicator of Atmospheric Pollution'.

6.3 Methodology

6.3.1 Introduction

This chapter has been completed having regard to the following:

- European Union, Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (2017)[1].
- Environmental Protection Agency, Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022)[2].
- Environmental Protection Agency, Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015)[3].
- Department of Housing, Planning and Local Government, Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)[4].
- Institute of Environmental Management and Assessment, 'Effective Scoping of Human Health in Environmental Impact Assessment' (2022)[5].
- Institute of Environmental Management and Assessment, 'Determining Significance for Human Health In Environmental Impact Assessment' (2022)[6].
- Department of Housing, Local Government and Heritage, Wind Energy Development Guidelines (2006)[7].

In relation to population, this chapter considers the potential direct and indirect effects of the Project on human beings living, working, and visiting in the vicinity of the wind farm site. To provide a clear assessment of potential impacts and effects, this chapter describes the demography, employment aspects and visitor attractions of the receiving community. The receiving community for the Project is identified as persons residing and engaging in activities within the study area; persons with a stake in the local and wider economy; and persons enjoying the recreation and cultural amenities of the area.

In relation to human health, the European Commission (EC) has published Guidance on the Preparation of the Environmental Impact Assessment Report (2017)[1]. This document defines human health as *"a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in*

[1] European Union. 2017. Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report.

[2] EPA. 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

[3] EPA. 2015. Advice Notes for Preparing Environmental Impact Statements.

[4] Department of Housing, Planning and Local Government. 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

[5] IEMA. 2022. Effective Scoping of Human Health in Environmental Impact Assessment. Institute of Environmental Management and Assessment.

[6] IEMA. 2022. Determining Significance for Human Health In Environmental Impact Assessment. Institute of Environmental Management and Assessment.

[7] Department of Housing, Local Government and Heritage. 2006. Wind Energy Development Guidelines.

disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study".

The EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)[2] states that the EIAR should assess the potential impacts on population and human health under the environmental categories addressed elsewhere in the EIAR, using the source-receptor pathways of air, water and soil and other health and safety issues as relevant.

Accordingly, the potential effects of the Project on the population and human health of the study area have been assessed, considering the conclusions of the various other chapters of this EIAR including:

- Chapter 9 Hydrology and Hydrogeology
- Chapter 10 Land, Soils and Geology
- Chapter 12 Shadow Flicker
- Chapter 13 Noise and Vibration
- Chapter 14 Landscape and Visual
- Chapter 16 Traffic and Transport
- Chapter 17 Air Quality
- Chapter 18 Climate

6.3.2 Study area definition

The study area for the Population and Human Health chapter encompasses the proposed wind farm site, the options for the GCR, and the options for the TDR. The Electoral Divisions (EDs) of Templemary, Kilmaclenine, Buttevant, Caherduggan and Mallow Rural have been selected as the study area which encompass the proposed wind farm site and GCR options, as shown in **Figure 6.1**. The TDR options are along main arterial routes from Foynes Port in Limerick (N69, N18, M20, N20) then on to local roads nearer to the wind farm site including the L5523 and L5302; and from the Port of Cork via the N28, N27, N40, N8 and N20 then onto local roads L1200 and L5302 to the site. The study area for this EIAR chapter encompasses the area immediately adjacent to local roads in each of the TDR options.

The nearest settlements in the study area are shown in **Figure 6.2**. These include Mallow, which is located approximately 8.2km south of the proposed wind farm site and Buttevant (a smaller town) which is approximately 4.7km to the northeast. Smaller villages and settlements in the vicinity include New Twopothouse, Lisgriffin, and Ballyclogh (Ballyclough) which are within 3.5km from the proposed wind farm site.

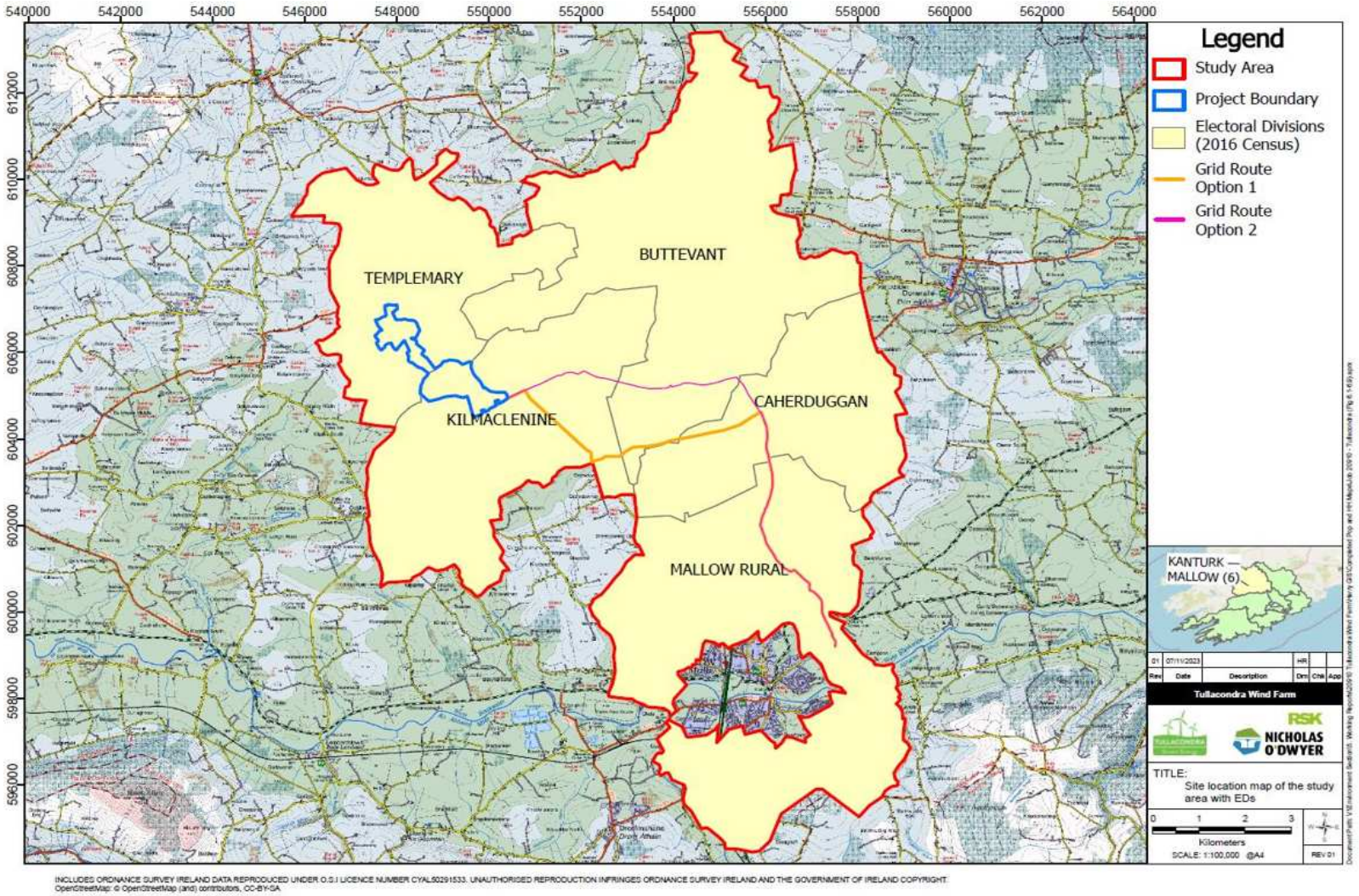

Figure 6.1: Site location map of the study area with EDs

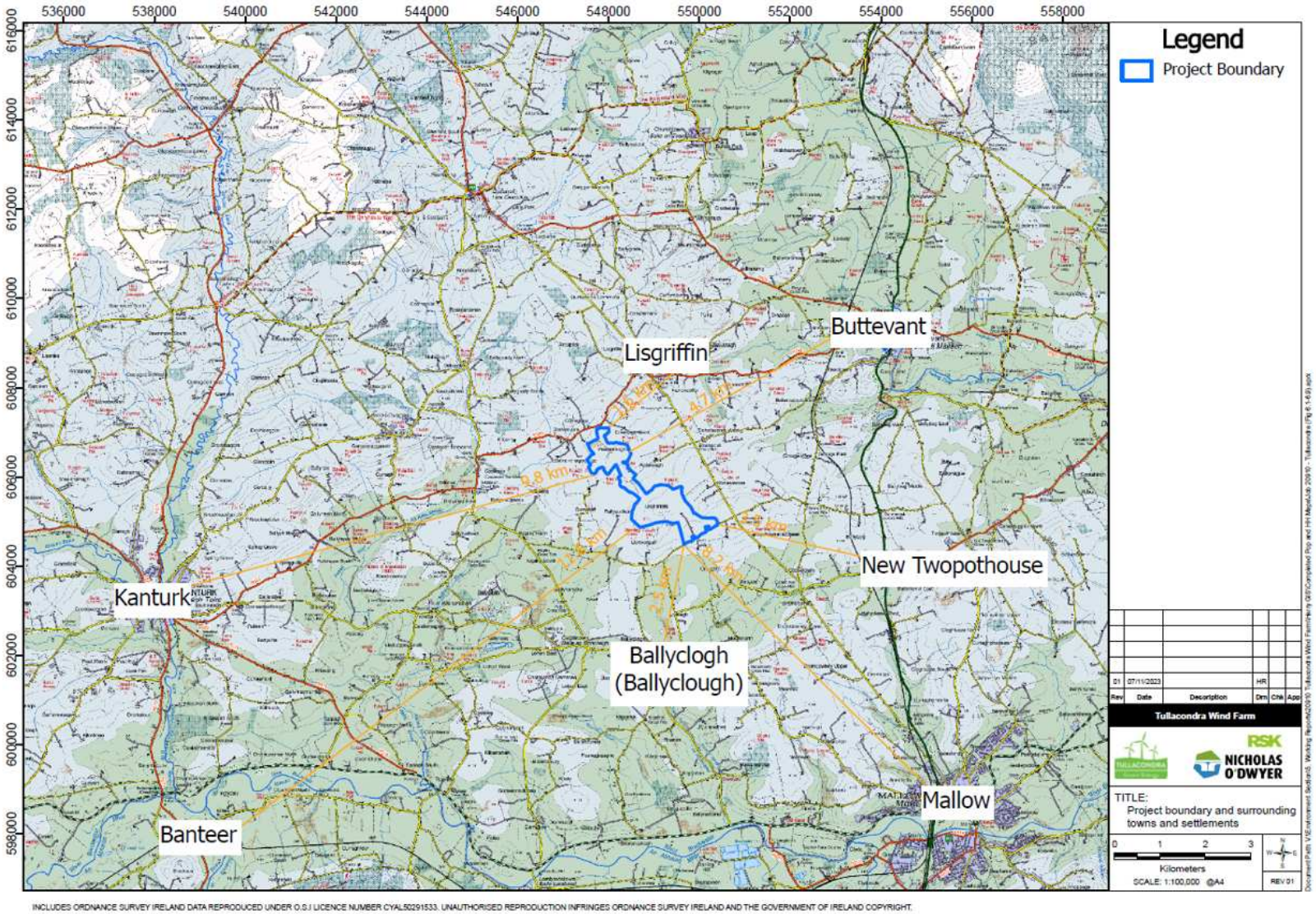

Figure 6.2: Project boundary and surrounding towns and settlements

6.3.3 Information sources

The assessment of impacts on population and human health involves the identification of relevant characteristics of the population in the receiving community that may be affected by the Project from quantifiable documentary research. The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and any relevant EIARs that are in the public domain. The principal sources of information for this EIAR chapter are:

- Census and employment information published by the Central Statistics Office (CSO). Available at https://data.cso.ie/
- Cork County Development Plan 2022-2028, available at: https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028
- Environmental Protection Agency (EPA) Maps, available at: https://gis.epa.ie/EPAMaps/
- EPA spatial data (including Corine Land Cover mapping), available at: https://gis.epa.ie/GetData/Download
- Fáilte Ireland records and spatial data, available at: https://www.failteireland.ie/Research-Insights/Open-data.aspx
- Ordinance Survey Ireland (OSi) mapping and aerial photography along with administrative boundaries spatial data, available at: https://data-osi.opendata.arcgis.com/

A desk-based study was undertaken in February 2023 to gather information regarding population, age structure, economic activity, and employment within the study area. The aim of the desktop study was to determine the current baseline environment. The baseline assessment includes preliminary results from the 2022 Census of Ireland (conducted on Sunday 3rd April 2022), which were released on 23rd June 2022 and, where available, the full results from the Small Areas Population Statistics (SAPS) and Electoral Division level, which were published by the CSO in September 2023[8], are used.

6.3.4 Assessment of effects

In this chapter, effects on population and human health are described in accordance with the EPA Guidance as presented in Figure 2.2 of EIAR **Chapter 2 EIA Methodology**. The significance criteria are summarised in **Table 6.1**.

Table 6.1: Significance criteria

Significance level	Criteria
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.

[8] Central Statistics Office, Census 2022 Publication Schedule, https://www.cso.ie/en/census/census2022/census2022publicationschedule/, accessed 20/06/2023.

Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Based on the defined criteria, where an effect has been classified as Significant, Very Significant or Profound, it is considered Significant in accordance with the EIA Directive. Where an effect has been classified as Imperceptible, Not significant, Slight or Moderate, it is considered Not Significant in accordance with the EIA Directive.

The significance of effects of the Project on population and human health are drawn from the findings of significance (before and after mitigation) of the following related EIAR chapters where relevant according to **Table 6.2**.

Table 6.2: Other EIAR chapters relevant to assessment of effects on population and human health

Chapter	Effects
Chapter 9 Hydrology and Hydrogeology	Human health
Chapter 10 Land, Soils and Geology	Human health
Chapter 12 Shadow Flicker	Amenity
Chapter 13 Noise	Recreation and Tourism, Amenity
Chapter 14 Landscape and Visual	Recreation and Tourism, Amenity
Chapter 16 Traffic and Transport	Recreation and Tourism, Human health, Amenity
Chapter 17 Air Quality	Human health
Chapter 18 Climate	Human health

6.4 Existing environment

6.4.1 Population

6.4.1.1 Population Change

In terms of the county, region and the state, population structure and change in Ireland are more strongly influenced by inward migration and emigration rates than by birth and death rates. The mid to late 1980's in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the country at that time. The most recent population estimates for the country published by the CSO (June 2022) indicate that the combination of a net inward migration and high birth rates has resulted in the population of Ireland exceeding 5 million for the first time since 1851. Projections for Ireland up to 2046 anticipate a population of approximately 5 million to over 6.7 million in the most optimistic scenario.

The 2016 Census recorded a total population of 8,029 in the Project study area as shown in **Table 6.3**. The 2022 Census results shows an increase in the total population for the study area to 8,707. This represents an increase of 648 people (8.44%) from 2016 to 2022.

Table 6.3: Population change in the study area 2016 and 2022

Study Area (EDs)	2011	2016	2022	Population change 2016 to 2022
Templemary	344	326	344	18
Kilmaclenine	744	725	709	-16
Buttevant	1,706	1,744	1,965	221
Caherduggan	540	619	644	25
Mallow Rural	4,026	4,615	5,045	430
Total	**7,360**	**8,029**	**8,677**	**678**

The table also shows population change between Census years from 2011 to 2022 for the EDs in that portion of the study area surrounding the proposed wind farm site (EDs of Templemary and Kilmaclenine). Between 2011 and 2016 there was a decline in population in Templemary ED of 5.23%, followed by an increase of 5.52% between 2016 and 2022. Between 2011 and 2016, Kilmaclenine ED experienced a decrease in population of 2.55% with the decline continuing to 2022 (2.20% between 2016 and 2022). Contrast the population change in the subject EDs with that of County Cork as whole which has seen an increase of 7.07% from 2016 – 2022 (**Table 6.4**).

Table 6.4: Population change comparison, 2006 to 2022 for Kilmaclenine and Templemary EDs and County Cork

Study Area (EDs)	2011-2016	2016-2022
Templemary	-5.23%	5.52%
Kilmaclenine	-2.55%	-2.20%
Co. Cork	4.59%	7.60%

As displayed in **Table 6.5,** according to the 2022 Census results, the EDs within the study area for the Project, with all EDs considered, has experienced a growth of 8.44% in population from 8,029 in 2016 to 8,707 in 2022. In the same period, the State experienced a growth of 7.60%, while County Cork has experienced a growth of 7.07%.

Table 6.5: Population change comparison, 2011 – 2022 for state, county (including Cork City) and study area.

Area	Population			% Population Change		
	2011	2016	2022	2011-2016	2016-2022	2011-2022
State	4,588,252	4,761,865	5,123,536	3.78%	7.60%	11.67%
County Cork	519,032	542,868	581,231	4.59%	7.07%	11.98%
Study Area (EDs)	7,360	8,029	8,707	9.09%	8.44%	18.30%

6.4.1.2 Population Density

Templemary and Kilmaclenine EDs are the least densely populated EDs in the study area, as seen in **Figure 6.3**. Kilmaclenine ED has roughly 30 people per km^2, whereas Templemary ED has only roughly 18 people per km^2. In comparison the ED of Mallow Rural has almost five times the amount of people per km^2 as Kilmaclenine ED and almost eight times more than Templemary ED. As shown in **Figure 6.4**, the study area is not a densely populated portion of the County. The closest densely populated settlement to the study area is Mallow Town.

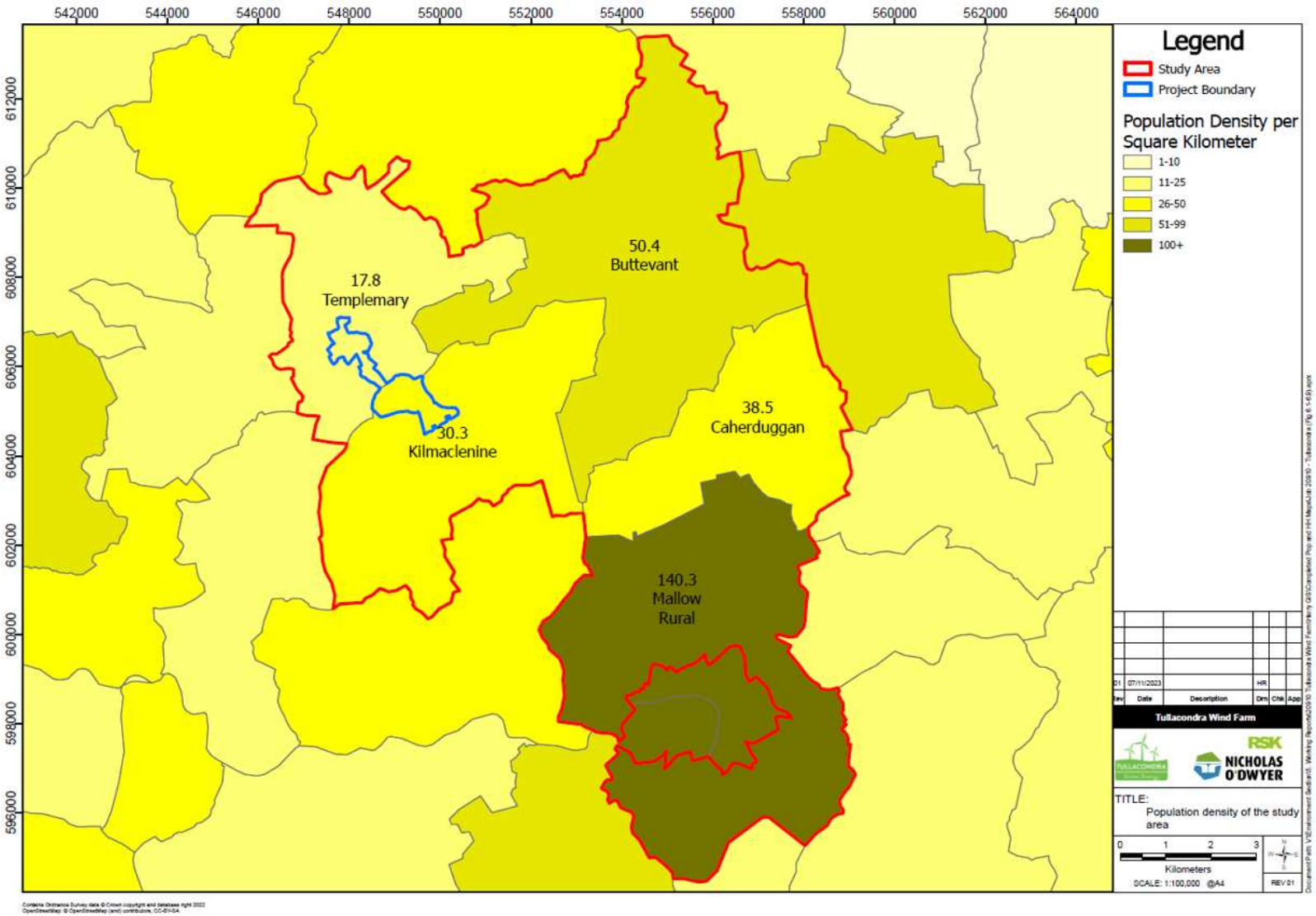

Figure 6.3: Population density of the study area

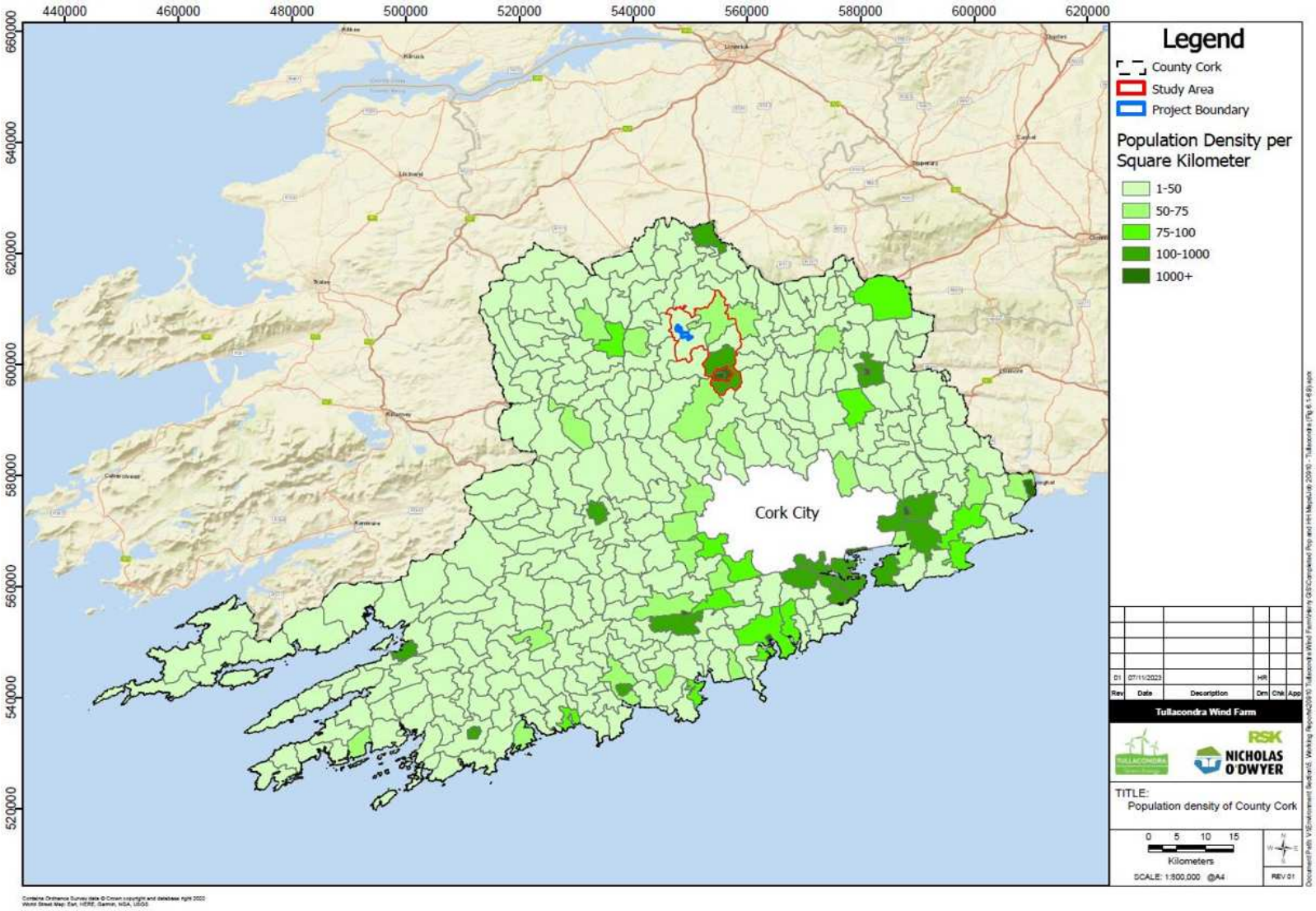

Figure 6.4: Population density of County Cork

6.4.1.3 Population age cohorts

Table 6.6 shows the distribution of population among the different age cohorts from the 2016 Census for the study area as compared with County Cork and the state.

Overall, the population of the study area reflects the general population trends in both the wider area of County Cork and the State. People aged 35 - 44 make up most of the population in the study area (17.86%) and this is in line with the figures for County Cork (16.31%) and the State (15.68%). The next largest population cohort in the study area, county and state are those aged 5 - 14. This age group makes up 16.61% of the study area, 15.40% of County Cork and 14.18% of the State.

People aged 15 - 64 (i.e., working age) make up 63.1% of the study area population, which is similar when compared to the County (64.1%) and the State (65.5%) of the State.

Table 6.6: Population age cohorts for the study area (EDs), County Cork (Excluding Cork City) and the State (2016 Census)

Age cohort	Study area (EDs)		County Cork		State	
	No. persons	% of Total	No. of persons	% of Total	No. of persons	% of Total
0-4	532	6.11	31,337	7.51	331,515	6.96
5-14	757	8.69	64,254	15.40	675,037	14.18
15-24	681	7.82	46,703	11.19	576,452	12.11
25-34	409	4.70	50,259	12.05	659,410	13.85
35-44	355	4.08	68,029	16.31	746,881	15.68
45-54	515	5.91	57769	13.85	626,045	13.15
55-64	618	7.10	44744	10.72	508,958	10.69
65-74	761	8.74	32186	7.71	373,508	7.84
75-84	723	8.30	16299	3.91	196,504	4.13
85 +	685	7.87	5631	1.35	67,555	1.42
Total	**8,707**		**417,211**		**4,761,865**	

The dependency ratio is a measure of the number of dependents aged 0 - 14 and over the age of 65, as a percentage of the total population aged 15 - 64 in an area. The dependency ratio is a demographic indicator which gives an insight into the number of people of non-working age (i.e., those aged 0 - 14 and 65+) compared with the number of those of working age (those aged 15 – 64). The higher the value, the less people of working age there are in the area (i.e., those depending on wage earners or the State for support).

The age dependency ratio of the study area was 3.3% higher than the national average in 2011. From 2011 to 2016 the dependency ratio of the study area rose by 5.9%, compared to a 4.2% increase in the County and 3.4% increase in the state.

Table 6.7: Age Dependency Ratio for 2011 and 2016 of study area in comparison to Cork County and State

Area	Dependency Ratio 2011	Dependency Ratio 2016	Dependency Ratio change 2011 to 2016
Study Area (EDs)	52.6%	58.5%	+5.9%
Cork County	51.8%	56.0%	+4.2%
State	49.3%	52.7%	+3.4%

The Haase Pratschke (HP) Relative Deprivation Index Score measures how a small area[9] relates to all the other small areas across the country[10]. This score indicates the level of overall affluence and deprivation at the level at SAPS level for Census years starting in 2006. The Higher the Relative HP Index Score, the more affluent the area is relative to the rest of the country. Equally, the lower the score, the more deprived the area is relative to the rest of the country. Scores which are than between -10 and 0 are classified as marginally below average, while scores between 0 and 10 are considered marginally above average[11].

The latest Pobal Relative HP Index Deprivation scores from 2022 for each of the EDs of the study area are shown in **Table 6.8**. According to this data, the study area has a HP Relative Deprivation Index score of above zero since 2006, which means it is classified as marginally above average. In 2016, the EDs of Kilmaclenine and Templemary had the two lowest scores of the EDs above zero in the study area, however they still were classified as marginally above average relative to the rest of the country. Kilmaclenine ED was classified as marginally below average up until 2016. The score for Templemary ED has been dropping since 2006, and in 2016 was barely classified as above average. Buttevant was the only ED in the study area in 2016 which was classified as marginally below average and has been so since 2006.

[9] Small areas collectively make up an ED.

[10] Trutz Haase Jonathan Pratschke, 2017, 'The 2016 Pobal HP Deprivation Index for Small Areas (SA)'

[11] Pobal, Pobal Maps, Available at: https://maps.pobal.ie/

Table 6.8: Pobal Relative HP Index Deprivation score for study area, 2016 and 2022

Study Area (Electoral Divisions)	Deprivation Score 2016	Deprivation Score 2022
Templemary	0.82	4.04
Kilmaclenine	0.82	1.06
Buttevant	-3.59	-3.35
Caherduggan	6.61	6.40
Mallow Rural	1.12	-0.37

6.4.2 Employment

The work force is defined as the number of people who are engaged in work (i.e., aged 15 - 64). CSO data records from 2016 shows that 47.8% of people in the area are in the work force, as shown in **Table 6.9.** This is in comparison to 43.1% of people in the work force in the County.

Table 6.9: The workforce 2016 study area and County

Area	Work Force (%) of total population
Study area	47.8%
Cork County	43.1%

A comparison between County Cork and the study area in terms of the population at work employed in the various Industries is shown in **Figure 6.5**. CSO data records from 2016 shows that 'Professional Services' and 'Commerce and Trade' are the two biggest sectors in which individuals of the study area are employed. This is in line with County Cork where these Industries are also first and second. Throughout both the study area and County Cork the sectors in which the working population are engaged are roughly the same, although both 'Professional Services' and 'Agriculture, Forestry and Fishing' were 3% higher in the study area than the county average for those Industries.

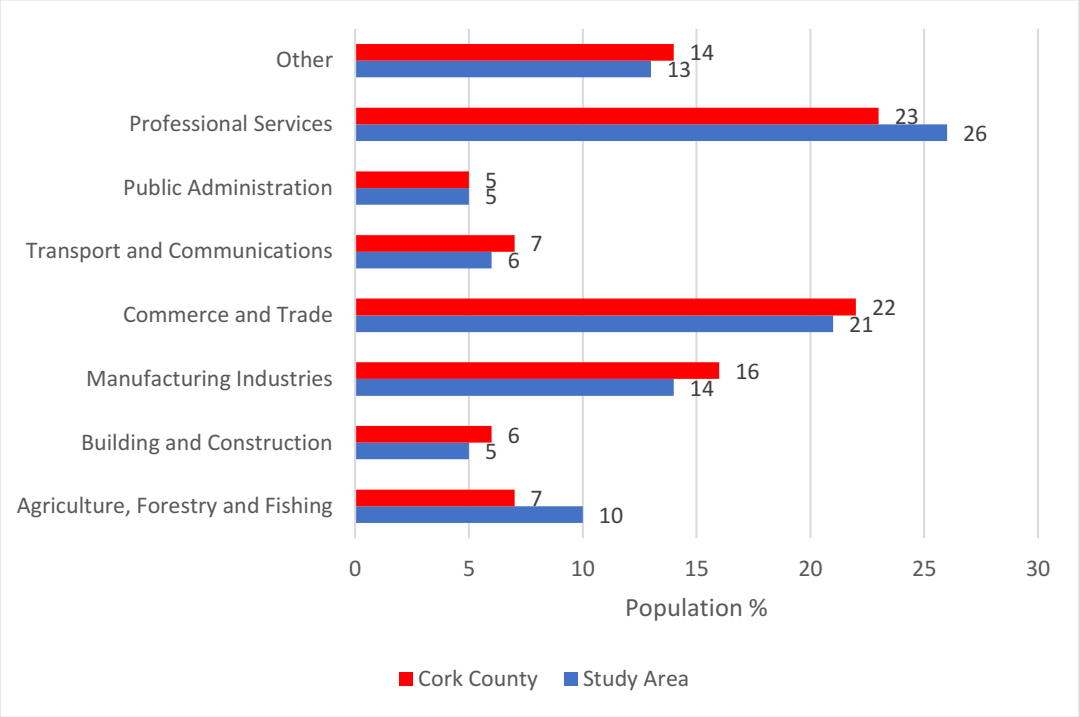

Figure 6.5: Comparison between Cork County and study area, population % employed by sector

As shown in **Figure 6.5,** of the population employed in the County in 2016, 7% were working within the Agricultural, Forestry or Fishing Industries, 22% were working within the Commerce and Trade Industry, and 23% in Professional Services. This is compared to 10%, 21%, and 26% in the study area, respectively.

Figure 6.6 shows that, excluding Mallow Rural ED, the rest of the EDs within the study area have higher percentages of the working population engaged in the Agricultural, Forestry or Fishing Industries than the County. The EDs of Kilmaclenine and Templemary have the highest percentage of the working population within the Agricultural, Forestry or Fishing Industries, with Templemary having more than double the County percentage working within these Industries in 2016 (18.1%).

The percentage of the working population of the study area working within the Commerce and Trade Industry and Professional Services Industry is shown in **Figure 6.7.** In the study area, the EDs of Kilmaclenine and Mallow Rural had a higher percentage of those working within this Industry, while the remaining EDs (Buttevant, Templemary and Caherduggan) had a lower percentage working within this Industry.

The highest percentage of those at work in the study area in 2016 were engaged within the Professional Services Industry. In terms of the EDs, there was a higher percentage of people working with this sector in the Kilmaclenine, Mallow Rural and Caherduggan EDs than in the Buttevant and Templemary EDs, as shown in **Figure 6.7**.

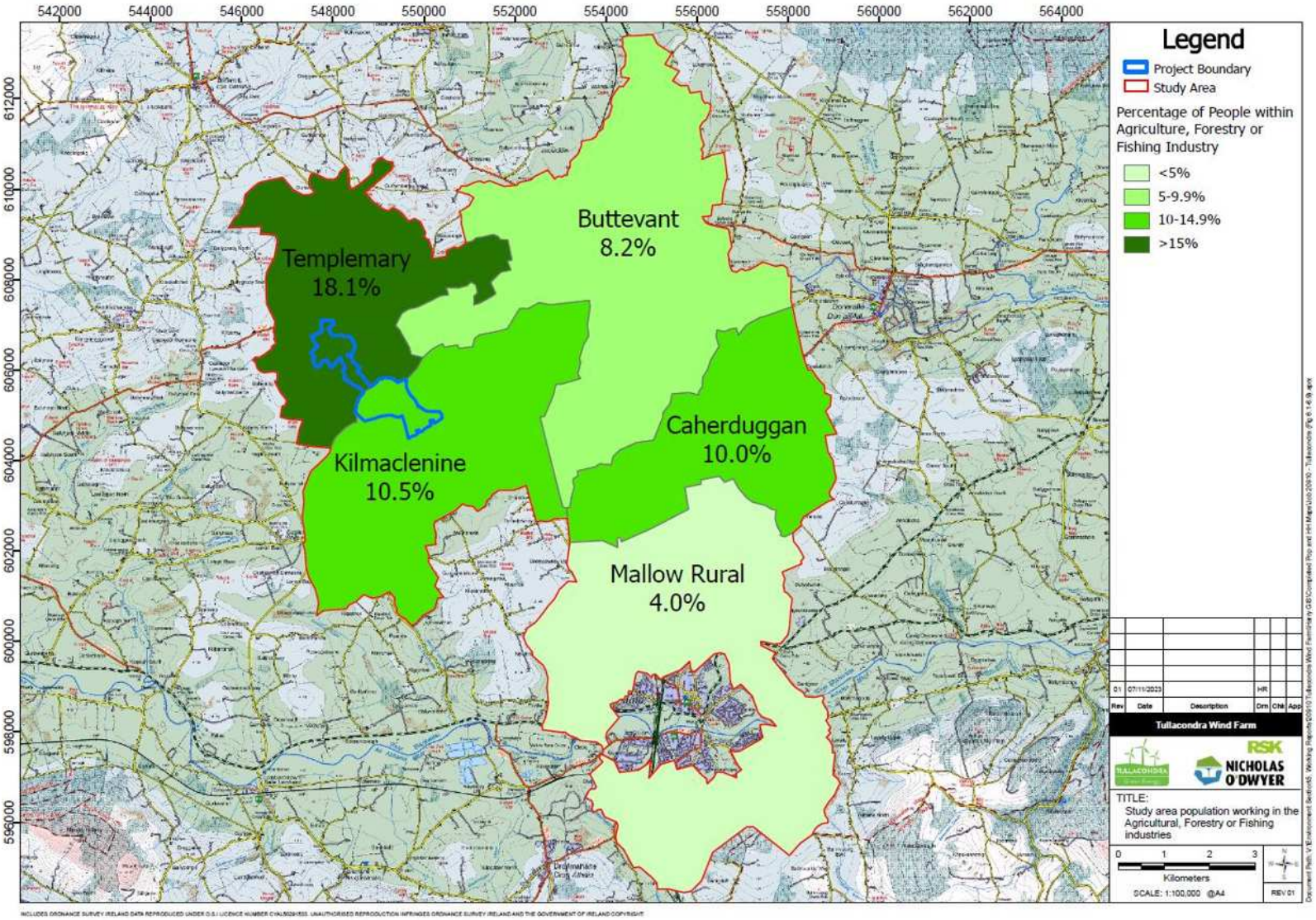

Figure 6.6: Study area population working in the Agricultural, Forestry or Fishing industries

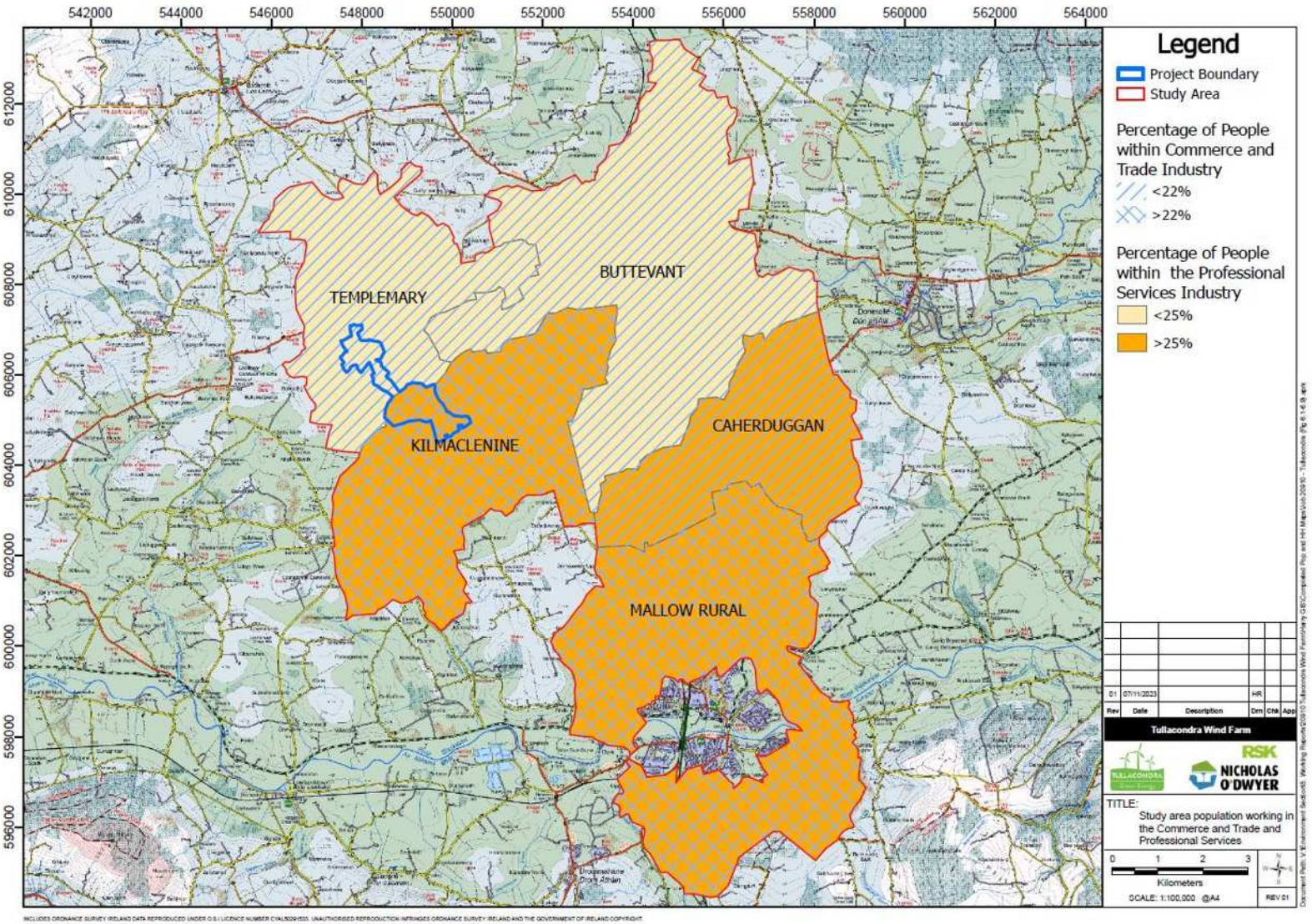

Figure 6.7: Study area population working in the Commerce and Trade and Professional Services industries

6.4.3 Land use

The map shown in **Figure 6.8** displays the Corine Land Cover within the study area from 2018. Pastures is the main Corine Land Cover within the study area, followed by Non-Irrigated Arable Land. The study area has a total of 12 different Corine Land Uses within it, and the site subject of the Project indicated by the blue line boundary is Pastures and Non-Irrigated Arable Land.

The GCR options are within the Urban Fabric of the public roadways, with lands adjacent it consisting of Pastures and Non-Irrigated Arable Land. The Mallow substation is an area denoted in the Corine Land Cover map as Discontinuous Urban Fabric.

The TDR options traverse through four different Corine Land Use Cover types which are Pastures, Non-Irrigated Arable Land, Discontinuous Urban Fabric and Mineral Extraction Sites.

6.4.3.1 Settlement pattern

The settlement pattern in the vicinity of the wind farm site (with approximately 2km of each proposed turbine position) is characterised by dwellings and farm buildings located mainly along the public roads, with some dwellings (older and newer) located down long private lanes. In some cases, newer dwellings have been built closer to the road, whilst the older dwelling remains at the end of the private lane, and apparently have been subsumed into the farmyard, no longer inhabited, being surrounded by sheds and farm machinery.

The settlement pattern of the area surrounding the wind farm site is evident in the sensitive receptors map displayed in **Figure 6.9** which shows the distribution of dwellings along local roads to the north (R580), east (L1319 and L13192) and south (L5302), with clusters in smaller settlements of Lisgriffin Cross in the north and Ballyclogh to the south.

The proposed GCR will be constructed primarily within the public road corridor or crossing main arterial routes. Construction solutions proposed for seven crossing points along GCR Option 1 are described in EIAR **Chapter 5 Project Description**, Table 5.4. The construction solutions for GCR Option 2 at three crossing points (up to Location 5 route for Option 1 at the junction R581 with L1207 at Hazelwood, Old Twopothouse Crossroads from which point the routes are the same) are described in EIAR **Chapter 5 Project Description**, Table 5.5. The lands along the GCR options are mainly farmlands, residential dwellings, and commercial premises including tourist accommodation.

The TDR options from the ports of origin at Foynes (Option 1) and Cork (Option 2) are along national primary and secondary roads, until turning off to local roads to the wind farm site. The lands along the national road corridors are mainly farmlands, residential dwellings, commercial premises, and settlements including Buttevant and Lisgriffin, and the urban areas of Foynes and Limerick City (Option 1) and and Ringaskiddy and Cork City (Option 2). Accommodating works along TDR options are described in EIAR **Chapter 16 Traffic and Transport** in Table 16.5 (Option 1) and Table 16.6 (Option 2). These works involve the temporary removal of street furniture, temporary surfacing at roundabouts, road verges and the site entrance, and trimming of trees and vegetation. As with the GCR options, the lands along the road corridor where temporary

accommodating works are required are mainly commercial premises, residential dwellings, and farmlands.

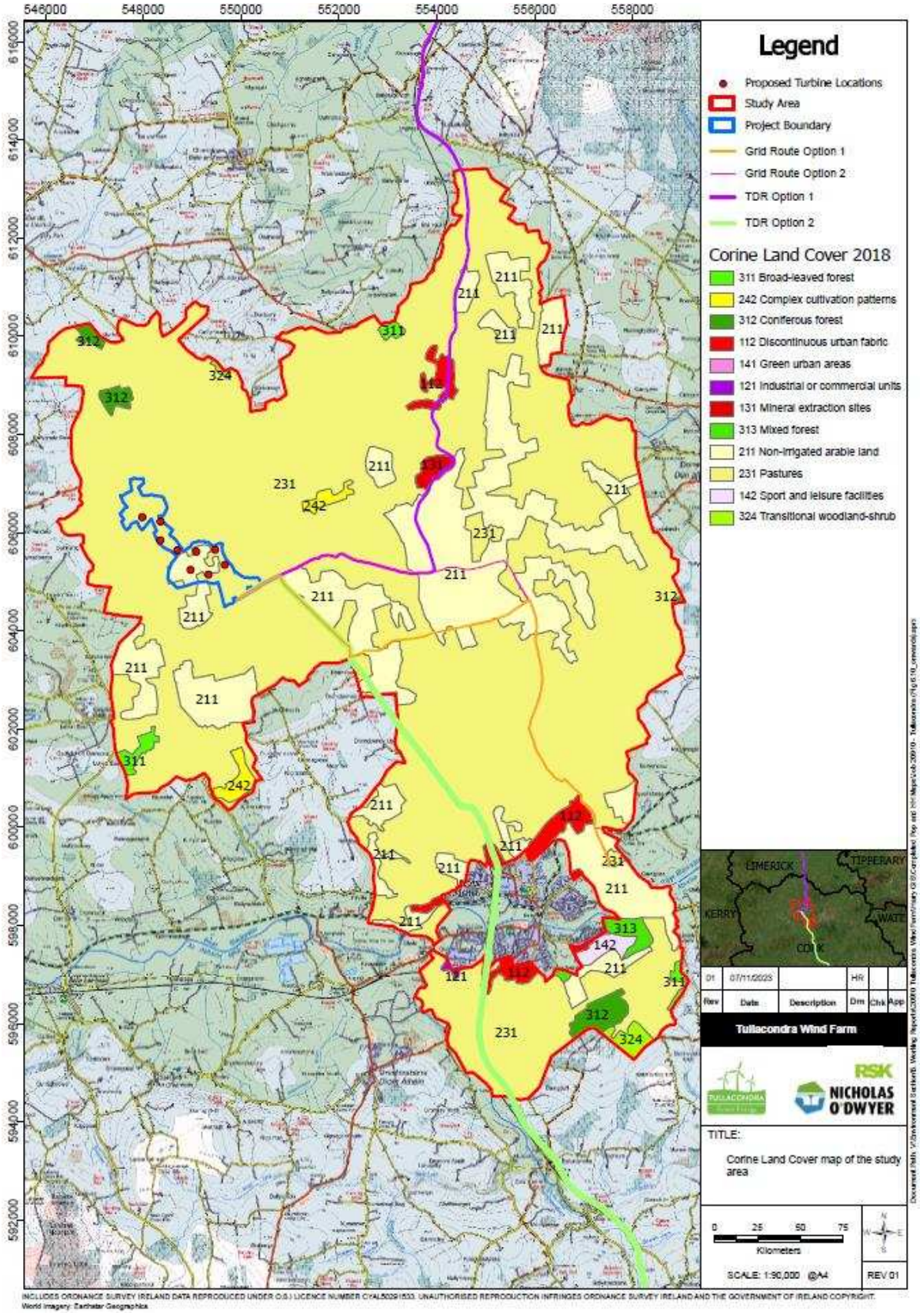

Figure 6.8: Corine Land Cover map of the study area

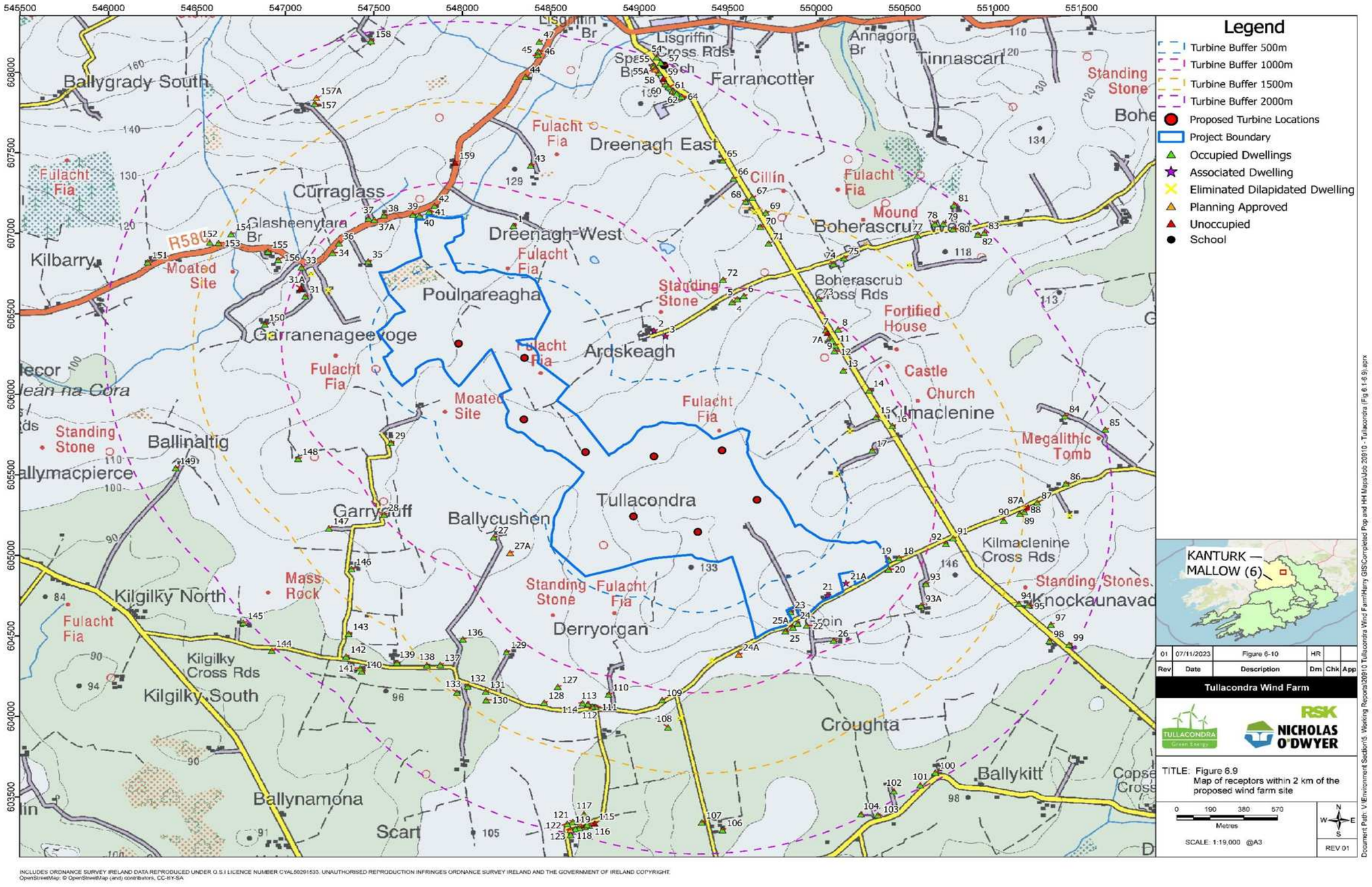

Figure 6.9: Map of receptors within 2km of the proposed wind farm site

6.4.4 Recreation and tourism

The information presented in this section of the chapter is taken mainly from Fáilte Ireland and the Cork County Development Plan 2022-2028[12]. Each of the Recreation, Amenity and Tourism locations within 10km of the wind farm site of the proposed wind farm listed in **Table 6.10** have been given a corresponding reference number in **Figure 6.10**, indicating their location. There are no major tourist attractions within 10km of the proposed wind farm site. Notable recreation, amenity and tourism attractions and activities within 10km of the proposed wind farm site include:

- Mallow is set in a rich and diverse landscape on the banks of the River Blackwater. It is this setting, established over centuries, which sets it apart from many other towns within the settlement network of the county. The eastern side of the town of Mallow is located within an area considered to have high landscape value as described in the Cork County Development Plan 2022 - 2028[12]. Notable attractions and activities in Mallow, located south of the proposed wind farm site, include Mallow Castle (Reference No. 4), Mallow Racecourse (Reference No. 22) and Mallow Golf Club (Reference No. 28).
- Ballyhass Lakes Adventure Centre and Wake Park (Reference No. 24 and 26) are located approximately 4.15km southwest of the proposed wind farm site. The Centre is located in a 36-acre site of a former quarry and offers a range of land, water and height activities and self-catering accommodation.
- Scenic Route S14 (Reference No. 66) is designated along the western approach to the town (N72 Killarney Road). It includes views of the river, Mallow Racecourse, and some large period residences[12].
- Kilguilkey House Equestrian Centre (Reference No. 65) is the closest tourism activity to the proposed wind farm site and is located approx. 1.8km west of the proposed wind farm site. Kilguilkey House offers some of the finest equestrian facilities in Munster, covering all areas of equestrian sport from Hunter Trials to Eventing, to Show Jumping, Dressage and Cross Country. The facilities at Kilguilkey House are utilised by Eventing Ireland, the Irish Pony Club, the Duhallow Hunt, the Duhallow Hunt Pony Club and several local riding clubs[13].
- The Donkey Sanctuary (Reference No. 1) is a charity located at Liscarroll approximately 6km from the proposed wind farm site which rescues and rehomes donkeys from all over Ireland. Visitors can attend the open farm and see over 150 donkeys and mules whilst making donations to support the charity[14].
- TDR Option 1 passes Ballybeg Augustinian Priory (Reference No. 5) enroute to the proposed wind farm site. The priory is located in Ballybeg, a village located near the town of Buttevant. There, visitors can view remains of the church, three-

[12] Cork County Council (2022), Cork County Development Plan 2022-2028. Available at: https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028

[13] Kilguilkey House, 'About' section, Available at: https://kilguilkeyhouse.com/about/

[14] The Donkey Sanctuary, 'About' section, Available at: https://www.thedonkeysanctuary.ie/about-us/our-mission

story tower, and stone coffins. There is also a well-preserved columbarium with a corbelled roof and more than 300 roosts[15].

- There are gun clubs in Ballyclough, Buttevant and Kanturk. These Gun clubs are all affiliated clubs of the Federation of County Cork Gun Clubs. The Cork federation is a fully insured member of the National Association of Regional Game Councils (NARGC), and its committee is drawn from local clubs to ensure that their views are well-represented. The NARGC support the development of restocking and conservation projects, and they also work on regional policy to help ensure the smooth running of local clubs[16].There is currently an informal arrangement between a landowner associated with the proposed wind farm and with gun clubs in the local area to utilise the tillage fields to release pheasants where there is good cover, feeding and nesting potential.

Table 6.10. Tourism and recreation amenities, activities and projects within 10km of the proposed wind farm site

Ref. No.	Name	Approx. Distance from proposed wind farm site (km)	General Direction
65	Kilguilkey House Equestrian Centre	1.80	West
31	Ballyclough GAA	1.48	South
59	The Udder House B&B	1.79	West
58	Tower Lodge B&B	3.81	East
26	Ballyhass Wake Park	4.14	South-west
24	Ballyhass Adventure Group - Mallow	4.15	South-west
5	Ballybeg Augustinian Priory	4.71	East
38	Kilbrin GAA	4.78	West
64	Donna & Noel House B&B	5.00	North-east
57	Springfort Hotel	5.31	East
30	Buttevant GAA	5.41	North-east
39	Castlemagner GAA	5.67	West
33	Liscarroll GAA	5.76	North-west
60	Longueville House Hotel	5.76	South
56	N/M20 Proposed Bypass	5.80	East
1	The Donkey Sanctuary	6.07	North
66	S14 – Scenic Route	6.34	South
62	The Courtyard Mallow B&B	6.52	South
32	Churchtown GAA	6.59	North
17	Sunfort English Language College	7.08	North

[15] Discover Ireland, 'Ballybeg Augustinian Priory', Available at: https://www.discoverireland.ie/cork/ballybeg-augustinian-priory

[16] The National Association of Regional Game Councils Website, 'NARGC Profile', Available at: https://www.nargc.ie/cpages/about

Ref. No.	Name	Approx. Distance from proposed wind farm site (km)	General Direction
22	Cork Racecourse Mallow	7.27	South-east
61	Hibernian Hotel	8.24	South-west
23	Mallow Heritage Centre	8.29	South-east
19	Mallow Swimming Pool	8.29	South-east
27	The Olde Fiddle Pub	8.73	South-east
25	Dragon Tours Eire	8.87	North
4	Mallow Castle	8.93	South-east
29	Mallow GAA	9.43	South-east
42	Killshannig GAA	9.45	South
37	Kanturk GAA	9.46	West
63	Byblox House B&B	9.48	East
21	Little Rascals	9.55	South-east
47	Doneraile GAA	9.65	East
11	Mullaghareirk - Rowls-Langford Loop	9.89	South-west
9	Mount Hillary Loop	9.90	South-west
10	Mount Hillary - Knightfield/Father Murphy's Loop	9.93	South-west
28	Mallow Golf Club	9.97	South-east
2	Kanturk Castle	10.32	South-west

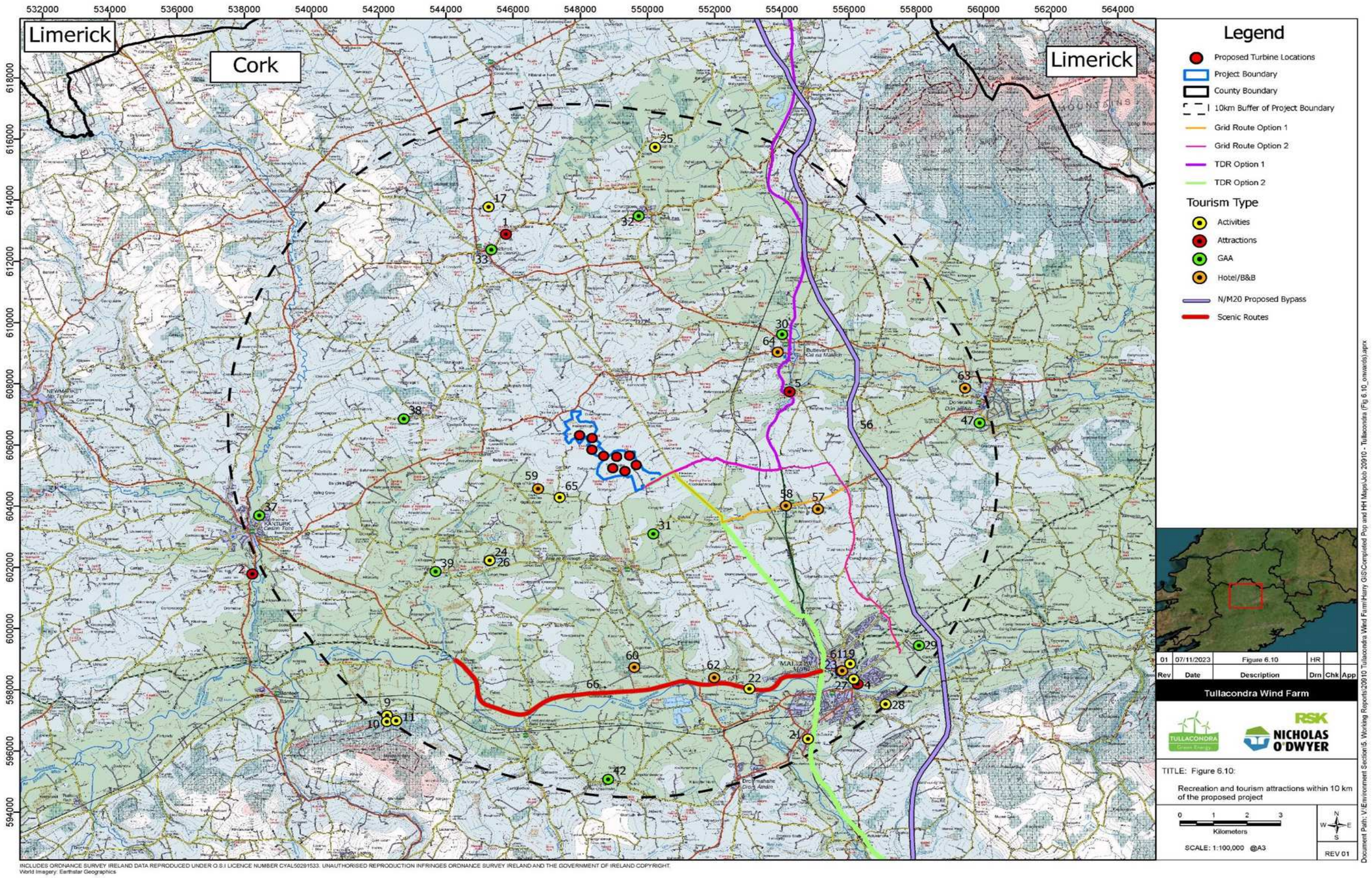

Figure 6.10: Recreation and tourism attractions within 10km of the proposed wind farm site

6.4.5 Human health

The Healthy Ireland Framework 2013-2025[17] defines health *as "everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play"*. The Framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone's lived experience[17]

Health is an essential resource for everyday life, a public good and an asset for human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing.

CSO data records shows that in the study area the ED of Kilmaclenine had the highest percentage of people that rated their health status as 'very good' in the 2016 Census, as shown in **Table 6.11**. Of all the EDs in the study area, Mallow Rural had the highest percentage of people who rated their health status as 'very bad' in the 2016 Census.

Table 6.11: Health status in the study area, 2016

Health Status – No. of People (%)						
Electoral Division	**Very good**	**Good**	**Fair**	**Bad**	**Very Bad**	**Not stated**
Buttevant	997 (57.2%)	515 (29.5%)	146 (8.4%)	34 (1.9%)	3 (0.2%)	49 (2.8%)
Caherduggan	382 (61.7%)	149 (24.1%)	35 (5.7%)	4 (0.6%)	2 (0.3%)	47 (7.6%)
Kilmaclenine	471 (65.0%)	186 (25.7%)	45 (6.2%)	8 (1.1%)	2 (0.3%)	13 (1.8%)
Mallow Rural	2778 (60.2%)	1263 (27.4%)	336 (7.3%)	74 (1.6%)	22 (0.5%)	142 (3.1%)
Templemary	202 (62.0%)	84 (25.8%)	29 (8.9%)	8 (2.5%)	0 (0.0%)	3 (0.9%)

In both Cork County and the study area the health status percentages are much the same, as shown in **Figure 6.11.** The highest deviation is recorded in the health status of 'very good' where the Cork County value is 63.1%, but the study area value is 61.2%. Overall, 87.7% of people in the study area rated their health as being either 'good' or 'very good' in comparison to 89.6% for the County.

[17] Gov.ie, 'Healthy Ireland Framework 2013-2025' Available at: https://www.gov.ie/en/publication/e8f9b1-healthy-ireland-framework-2019-2025/

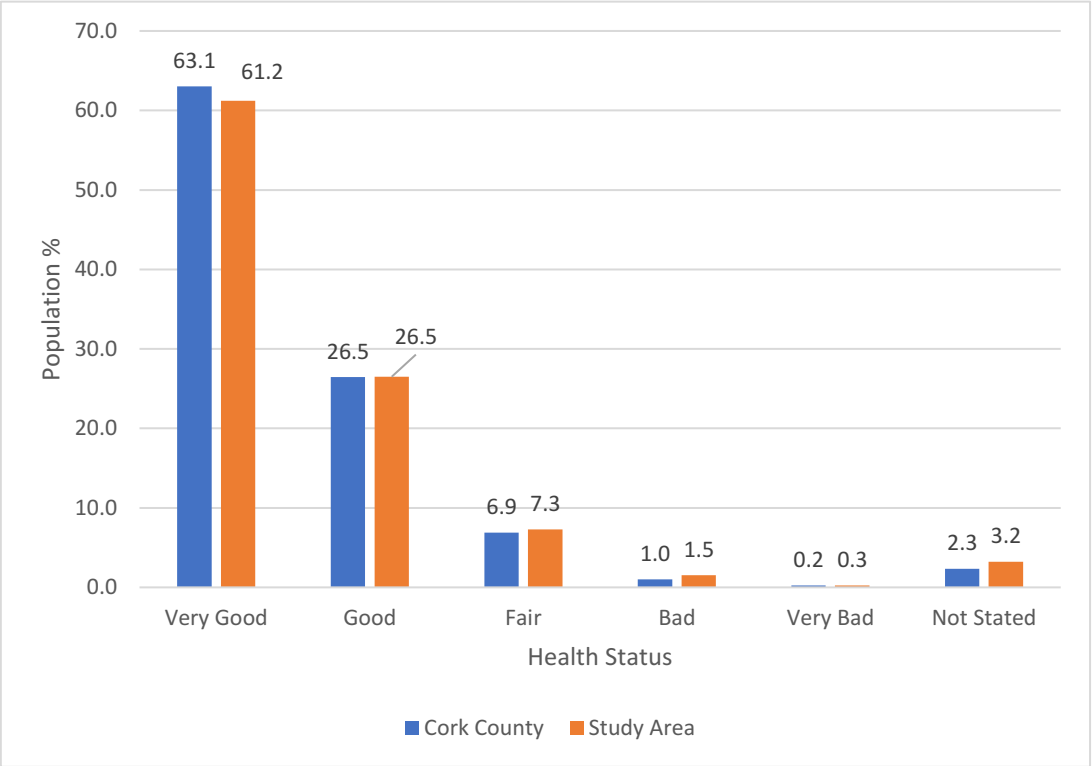

Figure 6.11: Clustered bar chart which shows the health status in study area compared to County Cork

6.4.6 Amenity

Amenity effects on the population (shadow flicker, noise, and landscape and visual) from operation of the proposed wind farm are addressed in this chapter. Refer to EIAR **Volume III Appendix 2.1** for a description of the methodology employed in identifying the sensitive receptors for the assessments contained in the EIAR. The sensitive receptors identified include occupied dwellings, unoccupied dwellings (excluding dilapidated properties), planning permission sites (validated and granted up to 20th March 2024), and a school. The few commercial properties in the study area include on-farm enterprises (e.g., equine) which are associated with a dwelling.

6.5 Potential effects - construction

6.5.1 Population

It is likely that many of the workers employed for construction of the Project will travel from outside the area or will take up residence locally. Workers from the immediate area may also be employed in site preparation and set up, as there is likely to be a ready pool of labour among the high proportion of workers in the study area within the Agriculture, Forestry and Fishing sector (i.e., local contracting companies). Changes to population and demographic trends of the study area, which would be reflected in the 2027 Census, are not expected to arise from construction of the Project. The effects on population and

demographic trends during construction phase would be **temporary** and **imperceptible** and **Not Significant**. .

6.5.2 Employment

A recent study by KPMG for Wind Energy Ireland[18] examines the income generation and job creation potential of onshore wind in meeting the Climate Action Plan target of 8,200MW of onshore wind by 2030. In this study, it is estimated that (excluding employment related to grid transmission works), by 2030 total direct and indirect employment could rise by 35% to 7,200, with most of these jobs benefiting rural areas (i.e., where onshore wind projects are located).

It is likely that there will be additional direct employment for people living in the study area who may be qualified for construction related roles, and indirect employment opportunities for the many retail and service establishments in Mallow, Buttevant and New Twopothouse. Materials will be sourced in the general locality where possible. This will assist in sustaining employment in the local construction related trades and businesses for the 18-month construction phase of the Project. The construction phase of the Project will therefore have a **short-term significant positive** (**Significant**) effect on the employment profile of the study area, and a **short-term slight positive effect** (**Not Significant**) on local businesses and services in the nearby towns and villages in the study area.

6.5.3 Land use

During the 18-month construction phase, farming activities of the landowners associated with the Project will be temporarily disrupted during site clearance and preparation including setting up temporary compounds, construction of access tracks, construction of the substation, and construction and installation of wind farm infrastructure. The construction works are confined to the lands within the red line boundary. This is likely to have a **temporary moderate negative effect** on the existing land use (agriculture) at the wind farm site, which would be **Not Significant**.

The grid will be installed in sections within the public road corridor. There will be rolling road closures in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems. This will allow for the works to be completed efficiently and minimise disruption time for residents and businesses over the anticipated five-month duration of the works. This will likely result in **brief slight negative effects** to residential, agricultural, and commercial land use where access will be restricted along the route, but **Not Significant**.

Temporary accommodating works for the TDR options include temporary removal of street furniture, temporary surfacing at roundabouts, road verges and the site entrance, and trimming of trees and vegetation. There is a likelihood of effects on land use in proximity to the works. Land uses along the TDR options may be affected due to access restrictions which are likely during the transportation of turbine components over the

[18] KPMG, Economic Impact of Onshore Wind in Ireland, April 2021, Economic impact of onshore wind in Ireland (windenergyireland.com), accessed 24/04/2024.

public roads. This is likely to have a **brief slight negative effect** on land-use in the study area, which would be **Not Significant**.

6.5.4 Recreation and tourism

There is the potential for recreation and tourism amenities located in the study area to be impacted during the construction phase of the Project comprising works for the wind farm and for the GCR and TDR options. There are no major tourism attractions within 10km of the proposed wind farm site that would be affected by the construction and therefore no impact on tourism numbers or revenue is likely. There are notable tourist activities within the study area in proximity to the proposed wind farm site including Kilguilkey House Equestrian Centre (located approx. 1.8km west of the proposed wind farm site) and the Donkey Sanctuary located at Liscarroll (approximately 6km north of the proposed wind farm site). Ballybeg Augustinian Priory near the town of Buttevant (approximately 4.71km from the wind farm site) is located along TDR Option 1, and tourist accommodation at New Twopothouse (Tower B&B) and Mallow (Springfort Hall Hotel) lie along GCR Option 1.

During the construction phase, there is not likely to be any effects on Kilguilkey House Equestrian Centre or The Donkey Sanctuary arising from the transport of turbine components, materials, and installation of the grid cabling. These attractions are 1.8km west and 6.0km north, respectively, of the wind farm site and the materials haul route, TDR options, and GCR options will be along the public roads to the east and to the north of the wind farm site. These attractions are sufficient distance from the wind farm site such that construction works will not give rise to significant adverse effects on them. The works include movement of vehicles and machinery, excavations, substation building works, and rock breaking (at location of T7 as described in section 5.2.6.1 of EIAR **Chapter 5 Project Description**). The construction phase impacts of the construction works on the wind farm site have been assessed in section 13.8.1 in EIAR **Chapter 13 Noise and Vibration**. The predicted noise level (at 700m from the works locations), at between 35 and 54 dB $L_{Aeq,T}$ (refer to Tables 13.11 and 13.12), is below the daytime construction noise criteria of 65 dB $L_{Aeq,T}$ per BS 5228 – 1:2009+A1:2014. The noise effects on these recreation and tourism resources of the study area during the construction phase for all elements of the Project is therefore considered to be **Not Significant**.

As described in section 13.8 of EIAR **Chapter 13 Noise and Vibration,** the excavation, installation and reinstatement for the grid connection works will take on average of one day to complete a 100m section and typically no more than a 100m section of trench will be opened at any one time. There is potential for construction noise levels from trenching works to approach 71 dB $L_{Aeq,T}$. This exceeds the daytime construction noise criteria of 65 dB $L_{Aeq,T}$. However, the duration of exposure of trenching is brief, with works occurring directly outside of any single dwelling or premises (i.e., Tower House B & B) lasting typically for less than one day. This will result in an adverse but brief nuisance. Due to the short duration of exposure, the noise effects at these dwellings and premises is **Not Significant**.

As with any dwelling or premises along the TDR and GCR options, Ballybeg Augustinian Priory and Springfort Hall Hotel are likely to be affected temporarily by traffic management measures for the wind farm, including the transport of turbine components and earth

materials, and during trenching works for installation of the grid connection. Where the increased traffic for all works is predicted to be ca. 1% (EIAR **Chapter 16 Traffic and Transport**), this is below IEMA threshold guideline limits, and is therefore **Not Significant**. While the traffic predictions are below threshold limits, there is no doubt that driver delay and severance effects will occur, albeit for a short duration during the 18-month construction phase. This is likely to have a **slight negative effect** on tourism resources. Where the effects are brief, these are deemed **Not Significant**.

6.5.5 Human health

There is potential for negative effects on human health during the wind farm construction phase. These include emissions of hydrocarbons to land and water, and release of silt-laden runoff into watercourses which could potentially pollute water supplies and contaminate land; and release of dust and exhaust emissions to air which could increase air pollution causing increased risk of stroke, heart disease, lung cancer, and chronic and acute respiratory diseases.

The potential for release of pollutants to surface and groundwaters and land during construction at the works areas (wind farm site and GCR options) is assessed in EIAR **Chapter 9 Hydrology and Hydrogeology** and **Chapter 10 Land, Soils and Geology** In the absence of mitigation, the construction activities which may affect ground and surface water quality with potential to impact water supplies, and land, with impacts to human health include accidental release of suspended solids, and hydrocarbons and horizontal directional drilling fluid , wastewater sanitation contaminants, and cementitious material. The excavations on site will be relatively shallow and it is anticipated that dewatering activities will be localised and will be unlikely to impact on hydrogeological flow regimes. Wet concrete will be used for turbine foundations and met mast and substation plinths, and associated footpaths. In the absence of mitigation, there is a potential to negatively impact groundwater quality when using poured concrete. All other concrete features for the Project will use precast concrete which will be imported on to site. Unmitigated, these effects could be significant, in the worst case scenario with **Significant** effects on human health.

EIAR **Chapter 17 Air Quality** presents an assessment of the effects on air quality from construction of the Project including earthworks, construction and trackout activities. The principal pollutants relevant to the assessment are considered to be NO_2, PM_{10} and $PM_{2.5}$, generally regarded as the three most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions (IAQM, 2014)[19]. These pollutants which arise from dust and exhaust emissions are generally considered to have the greatest potential to result in human health impacts. In the absence of mitigation, when assessed against the IAQM criteria, the magnitude of dust emissions for earthworks and construction is medium, whist the magnitude of dust emissions from trackout along public roads and within the site is large. When combined with the sensitivity of the area in relation to human health (Table 17.4), the risk of impacts on human health from dust are determined to be low. In relation to exhaust emissions, the predicted HGV and LGV generation does not exceed the Design Manual for Roads and Bridges (DMRB) screening criteria and

[19] Institute of Air Quality Management (IAQM). 2014. Guidance on the assessment of dust from demolition and Construction.

therefore further assessment of the construction phase traffic emissions is not required. The short-term increase in vehicle emissions during construction phase is **Not Significant**.

Accommodating works along the public roads and the delivery of heavy/bulky goods and components on narrow roads and works for the GCR may lead to temporary limited access to farmlands, and residential and commercial properties, creating a potential hazard along the route and at identified pinch points. This would have a **temporary moderate, negative effect** on public safety along the turbine delivery and GCRs during the construction phase, but **Not Significant**.

6.5.6 Amenity

6.5.6.1 Noise and vibration

EIAR **Chapter 13 Noise and Vibration** describes the likely significant effects from construction at the wind farm site and along the GCR. The predicted noise levels from construction at the proposed wind farm site, inclusive of rock breaking) as discussed in section 6.5.4, are predicted to be in the range of 35 to 54 dB $L_{Aeq,T}$ at the closest noise sensitive location. This predicted noise level is below the daytime construction noise criteria of 65dB $L_{Aeq,T}$ in accordance with BS 5228 – 1:2009+A1:2014. **No significant effects** on amenity arising from noise during construction at the wind farm site are therefore anticipated.

The predicted noise effects associated with installation of the grid connection would potentially affect several dwellings in the vicinity of both route options. Occupants of these dwellings will experience noise during the construction works. These dwellings are typically around 10m to 20m from the trenching works locations. At the closest noise sensitive receptors the predicted construction noise levels from trenching may be up to 78dB $L_{Aeq,T}$. For both GCR options, the predicted noise level exceeds the daytime construction noise criteria of 65dB $L_{Aeq,T}$, which is significant. However, due to the method and sequencing of the works, the duration of exposure to noise from trenching is brief, with works occurring directly outside any single dwelling or premises typically for less than one day. This will result in an **adverse** but **brief** nuisance. Due to the short duration of exposure, the noise effects at these dwellings and premises is **Not Significant**.

Due to the distance of the proposed works from sensitive locations, significant vibration impacts are not expected. It is noted that rotary piling may be required on the wind farm site during construction, however considering the distances between these construction activities and nearby noise sensitive locations, vibration from these activities would not be perceptible and would be orders of magnitude below levels where cosmetic or structural damage would be expected.

The summary of effects prior to mitigation of noise and/or vibration from construction works for the Project is provided in **Table 6.12** (taken from EIAR **Chapter 13 Noise and Vibration**, Table 13.14).

Table 6.12:Summary of likely significant construction noise/vibration effects

Works	Summary of Effects		
	Quality	Significance	Duration
Turbine + Substation Construction	Adverse	**Not Significant**	Temporary
Grid Connection	Adverse	**Not Significant**	Brief

6.5.6.2 Traffic

EIAR **Chapter 16 Traffic and Transport** describes and assesses the effects of construction of all elements of the Project which have the potential to lead to a negative effect on the existing road network including, in respect of amenity, delay and disruption to road users and access to properties. Construction at the main wind farm site will entail movement of vehicles to and from the site for delivery of materials and components as well as personnel.

Along the GCR, rolling road closures will be in place to facilitate cabling works in combination with lane closures, partial road closures and stop/go systems. This will allow for the works to be completed efficiently and minimise disruption time for residents and businesses over the anticipated five-month duration of the works. Temporary accommodating works for the TDR options include removal of street furniture, temporary surfacing at roundabouts, road verges and the site entrance, and trimming of trees and vegetation.

Road users along the routes for delivery of materials and components to the wind farm site, and along the GCR and TDR options may be affected briefly or temporarily due to access restrictions which are likely during the transportation of turbine components over the public roads. This is likely to have a **brief to temporary slight negative effect** on the amenity of road users, residents and businesses in the study area, but will be **Not Significant**.

6.6 Potential effects - operation

6.6.1 Population

The potential effects on population and demographic trends arising from the Project during its operation over its 35-year lifetime relate to long term employment opportunities for skilled operations and maintenance personnel which can be drawn from the local population once these skills bases are developed (refer to section 6.5.2). It is more likely that these workers will come from further afield, so is not expected to result in changes to population and demographic trends of the study area during the operation phase of the Project. The effects on population and demographic trends during the operation phase are therefore **imperceptible** and **Not Significant**.

6.6.2 Employment

Once it is operational, the Project will bring direct and indirect employment to the study area. As highlighted in a report by Siemens/IWEA (WEI) titled "An Enterprising Wind",[20] in contrast to the short-term opportunities for employment during the construction phase, there is potential for longer term job creation (15 years) in the operations and maintenance of onshore wind farms. As discussed in section 6.5.2, it is estimated that (excluding employment related to grid transmission works), by 2030 total direct and indirect employment could rise by 35% to 7,200, with most of these jobs benefiting rural areas (i.e., where onshore wind projects are located).

According to Wind Energy Ireland's (WEI) publication titled "Powering Cork"[21], '*an enormous opportunity now exists for a whole new industrial sector to emerge in Cork'*. There is potential for the Project to make a substantial contribution to creating jobs, supporting the rural community and investing in the Cork economy. This would result in **long term positive effects** of this Project on the local and wider economy of County Cork over the lifetime of the Project, which would be **Significant**.

6.6.3 Land use

Once construction is completed, the footprint of the Project, taken as the area of land within the wind farm site under permanent access tracks and turning areas, hardstanding areas and bases for the turbines and met mast, the substation and control building, and drainage infrastructure will total approximately 3.49ha. This constitutes a permanent land use change from agriculture (tillage and grazing) to wind farm infrastructure and will occupy approximately 6% of the red line planning boundary (58.6ha).

All infrastructure will be grassed over and will return to agricultural use in the operational phase. The hard-core base of the temporary internal access tracks, hardstanding areas and crane pads will remain under grass so that this infrastructure, which provide suitable turning radii and bases for movement of cranes and vehicles for replacement of turbine components, can be called into service in the unlikely event it is required over the lifetime of the Project. It is envisaged that the land will continue to be used for grazing throughout the 35-year lifetime of the proposed Project and, as a result, there will be minimal impact on existing land uses for the operational phase.

The biodiversity mitigations and enhancements proposed for the Project (as contained in the HMP in EIAR **Volume III Appendix 7.3**) are essential features and land management measures which will enhance biodiversity within the farmlands and improve sustainability of farming operations. These features and land management measures are in line with environmental improvement schemes for farmers under schemes funded by the Department of Agriculture, Food and the Marine such as the Green, Agri-Climate Rural Environmental Scheme (ACRES). The land use change resulting from the Project is considered **permanent, slight, and positive**, and therefore **Not Significant**.

[20] Siemens/IWEA, 'An enterprising wind' – an economic analysis of the job creation potential of the wind sector in Ireland', 2013, http://www.tara.tcd.ie/bitstream/handle/2262/71272/BKMNEXT250.pdf?sequence=1&isAllowed=y, accessed 02/06/2023.

[21] IWEA, Powering Cork, September 2022, https://windenergyireland.com/images/Article_files/PoweringCork-DigitalVersion-SinglePage.pdf, accessed 02/06/2023.

Though it is unlikely, there is potential for the underground cable of the grid connection to require repair and/or for accommodating works being undertaken for the transport of replacement turbine components during the 35-year operational life of the Project. The effect of this activity and works, should they occur, will be the same as the construction phase with impacts on road users and occupiers of residential, commercial and other premises along the subject routes, arising from noise and disruption. However, these works will be **brief**, **slight and neutral** in effect, and therefore **Not Significant**.

6.6.4 Recreation and tourism

Once the Project is constructed, the wind turbines, access tracks and substation of the wind farm will become permanent features in the landscape. The effects of the Project on recreation, amenity and tourism relate to the perceptions of those living, working, and visiting the study area, and their attitudes towards the presence of turbines in the wider landscape.

The character and scenic qualities of the Irish landscape are of great importance to tourism in Ireland. In recognition of the need to achieve EU targets on reduction of greenhouse gas emissions and the potential conflict that may arise when identifying opportunity areas for developing renewable energy, SEAI and Fáilte Ireland have conducted surveys on visitor attitudes to wind farms in 2002, 2007 and 2012. The 2012 Fáilte Ireland publication titled 'Visitor Attitudes on the Environment, Wind Farms' (2012),[22] is an update on the often-cited Fáilte Ireland survey that was undertaken in 2007.[23] The following is summarised from the 2012 survey:

- 56% of visitors surveyed saw a wind farm while on holiday in Ireland, up from 49% in 2007.
- 47% of visitors surveyed felt that wind farms had a positive impact on the landscape, while 30% felt it had a negative impact, compared with 32% and 17% respectively in 2007.
- 48% of visitors surveyed felt that wind farms had no impact on their sightseeing experience (up from 45% in 2007), with fewer saying they have a positive impact (down to 32% from 40% in 2007).
- 71% of visitors surveyed felt that greater numbers of turbines in Ireland would either have no impact or would have a positive impact on their likelihood to visit Ireland. The reason given for this is the positive support for renewable energy and recognition of the need to reduce carbon emissions.

[22] Fáilte Ireland, 'Visitor Attitudes on the Environment, Wind Farms', 2012 / No. 1 (Update on 2007 research), 2012, https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/WindFarm-VAS-(FINAL)-(2).pdf?ext=.pdf, accessed 22/06/2023.

[23] Fáilte Ireland, 'Visitor Attitudes on the Environment, Wind Farms', 2008 / No. 3, 2008, https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/Visitor-Attitudes-on-the-Environment.pdf?ext=.pdf, accessed 22/06/2023.

In the report's conclusion, Fáilte Ireland states:

> *"Given the scenario where more wind farms are to be built in Ireland in the future, the most widely held view is that this will not impact their likelihood to visit the area again, with a slightly greater majority saying that this would have a positive rather than a negative impact. It is worth noting that based on 2007 the proportion citing a positive impact has declined in favour of those who feel it would have no impact."*

Wind Energy Ireland has conducted regular polls on public attitudes to wind farms since 2017. The latest survey commissioned by Wind Energy Ireland was conducted by Interactions Research in November and December 2022. The results of the survey are reported in 'Wind Energy Ireland, Public Attitudes Monitor' (December 2022)[24] and were presented at the Wind Energy Ireland conference in February 2023. A summary of the results from the survey is as follows:

- Four out of five respondents (85% of those surveyed) are in favour of wind power. This is up 6% from 2021 surveys. Among a sample of rural dwellers, 85% registered favourable attitudes to wind power.
- The most cited reason for being in favour of wind power are that there is plenty of wind to be harnessed in Ireland. Other benefits mentioned were helping the environment, and the cost effectiveness / cost saving nature of wind power.
- 58% of respondents said they would be in favour of developing wind farms locally. This is the highest percentage since 2017. Among rural dwellers, 1 in 10 registered being opposed to developing wind farms locally.

In May 2023, SEAI published results of a survey of over 1,764 households, 1,116 of which are living within 5km of fifty new commercial wind and solar PV projects across rural Ireland.[25] The survey was undertaken in 2022 and is part of a long-term study to evaluate the effects of public policies on people's attitudes towards the energy transition in Ireland. A summary of the results from this survey are as follows:

- On average, 67% of those surveyed have registered a positive attitude to wind farms. The percentage is greater (72%) for those who live <1km from a wind farm.
- Across rural Ireland, general levels of support for wind and solar energy projects remain very high, regardless of whether people live close to new projects or far away.
- On average, 78% of those surveyed support government policies that secure financial benefits for households and communities through 'Community Benefit Funds'. This increases to 84% among those who live <1km to new renewable energy infrastructure projects.

Overall, these survey results demonstrate that there is an increasing acceptance and more positive views of wind energy in Ireland by people living, working, and visiting areas

[24] Wind Energy Ireland, Public Attitudes Monitor (December 2022), https://windenergyireland.com/images/Final_WEI_Annual_Attitudes_Survey_2022.pdf, accessed 22/06/2023.

[25] SEAI, Irish national survey of households near new commercial wind and solar farms, Survey method and selected results, May 2023, https://www.seai.ie/community-energy/ress/impacts-research/index.xml, access 22/06/2023.

where there are wind turbines. It is anticipated that, over time, the wind turbines in the Project will become a feature of the landscape and viewed positively by the community.

EIAR **Chapter 14 Landscape and Visual** presents an assessment of the landscape and visual amenity effects on key recreational routes, and recreational facilities and heritage sites. From recreational facilities and heritage sites the effects of the Project would be limited due to the effects of distance or screening by vegetation and landform. In the case of Ballyhass Adventure Sports Centre, while the Project would be noticeable from elevated parts of the facility, visitors would be focussed on sports activities and views of the surrounding landscape would be incidental to enjoyment of these activities**.**

Table 6.13 provides a summary of landscape and visual effects of operation of the proposed wind farm on recreational facilities and heritage sites, taken from EIAR **Chapter 14 Landscape and Visual**, Table 14.12. The significance of effects ranges from **minor to moderate/minor to moderate (**but **Not Significant), adverse** for the subject recreational facilities and heritage sites.

Table 6.13: Operational phase landscape and visual effects of the proposed wind farm on recreational routes and recreational facilities and heritage sites

Receptor	Sensitivity	Magnitude	Significance	Beneficial/ Neutral/ Adverse
Visual Receptors				
Recreational facilities and heritage sites				
Kilguilkey House Equestrian Centre	Medium	Moderate/slight	**Moderate/minor (not significant)**	Adverse
Ballyhass Adventure Sports Centre	Medium	Slight	**Moderate/minor (not significant)**	Adverse
Ballybeg Augustinian Priory	High/medium	Slight	**Moderate (not significant)**	Adverse
Mount Hillary Loop Walks	High/medium	Slight	**Moderate (not significant)**	Adverse
Mallow Golf Course	High/medium	Slight/negligible	**Minor (not significant)**	Adverse

6.6.5 Human health

An operational wind farm is not a recognised source of pollution. It is not an activity that falls within any thresholds requiring licensing under the Environmental Protection Agency Licensing Act 1992, as amended. As such, a wind farm is not considered to have ongoing significant emissions to the environment during its operation, and therefore no potential for negative human health effects.

In relation to safety aspects of human health, turbines pose no threat to the health and safety of to the public. Section 5.7 of the Department's 'Wind Energy Development Guidelines for Planning Authorities (2006)[7] states

> "*There are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety considerations.*

People or animals can safely walk up to the base of the turbines" and further that *"There is a very remote possibility of injury to people from flying fragments of ice or from a damaged blade*. *Most blades are composite structures with no bolts or separate components and the danger is minimised as a result. The build up of ice on turbine blades is unlikely to present problems. Most wind turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by the icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation."* (p. 31)

Turbine blades are manufactured of fibre-reinforced polymers (FRP), carbon fibres or a composite of these materials. These are non-conducting materials which will prevent any likelihood of an increase in lightning strikes within the site of the proposed wind farm. Lightning conduction cables, encased in protection conduits, will follow the electrical cable run from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during construction of the turbine foundations.

The provision of underground electric cables of the capacity proposed is common practice throughout the country and installation to the required specification does not give rise to any specific health concerns. The ESB document 'EMF & You' Information about Electric & Magnetic Fields and the electricity network in Ireland (2017)[26] provides practical information on EMF. In this publication, the ESB review authoritative sources on the effects of EMF of human health to determine that, after 35 years of health and scientific research, no health agency has concluded that there is a causal relationship between magnetic fields and health effects

The "flickering" effect of shadow flicker may concern individuals who suffer from photosensitive epilepsy (or seizures triggered by flashing lights or contrasting light and dark patterns). However, modern wind turbines rotate at a maximum rate of 20 revolutions per minute (rpm)[27] and have three blades, meaning shadow flicker would never be greater than 3 x 20 = 60 rpm (or 1 hertz). This is well below the 120 flashes per minute (or 3-hertz) threshold known to trigger epilepsy symptoms[28]. Therefore, shadow flicker from wind turbines is not considered a concern to human health[29]. Regardless, the mitigation proposed in EIAR **Chapter 12 Shadow Flicker** including turbine shutdown at times when the conditions for shadow flicker are detected by an installed software module, would be well below the Wind Energy Guidelines (2006) threshold limits and would therefore be **Not Significant** and therefore will not have the potential to cause health effects.

[26] ESB, 'EMF & You' Information about Electric & Magnetic Fields and the electricity network in Ireland (2017), https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0, accessed 20/06/2023/

[27] U.S. Office of Energy Efficiency & Renewable Energy (2023),

https://www.energy.gov/eere/wind/how-wind-turbine-works-text-version (accessed on 14/11/2023).

[28] U.K. Epilepsy Society (2023)

https://epilepsysociety.org.uk/about-epilepsy/epileptic-seizures/seizure-triggers/photosensitive-epilepsy (accessed on: 14/11/2023)

[29] U. S. Department of Energy, WINDExchange, Wind Energy Projects and Shadow Flicker (2023), https://windexchange.energy.gov/projects/shadow-flicker#:~:text=However%2C%20modern%20wind%20turbines%20rotate,known%20to%20trigger%20epilepsy%20symptoms, (accessed 06/11/2023).

According to the World Health Organization[30] the health effects from long term exposure to noise above guideline limits of 45 dB *L den* include cardiovascular disease, annoyance, and hearing and cognitive impairment. EIAR **Chapter 13 Noise and Vibration** concludes that whilst background noise levels will increase due to the wind farm development, the predicted levels will remain low (i.e., highest calculated 'downwind' turbine noise level of 41.2dB $L_{A90,T}$ at non-financially involved receptors). Where this is below the WHO guideline limits, operation of the wind turbines will not have the potential to cause health effects.

There are no health effects of turbines arising from effects on landscape and visual amenity.

6.6.6 Amenity

6.6.6.1 Shadow flicker

EIAR **Chapter 12 Shadow Flicker** presents an assessment of the 'worst case' shadow flicker which may result from operation of the proposed wind turbines. The results of modelling undertaken for the eighty-eight sensitive receptors within the study area (1,500m from proposed turbine positions) reveals that for the 'worst-case' scenario twenty-five would experience no shadow flicker and sixty-three could potentially experience shadow flicker. Of these, forty-nine receptors exceed the Wind Energy Development Planning Guidelines (2006)[7] thresholds of thirty hours per year or thirty minutes per day. Potential effects are greatest at properties closest to the turbines on the eastern and western sides of the development. Taking into account average annual sunshine data to identify the more 'likely' hours per year, the number of sensitive receptors with the potential for shadow flicker exceeding the guideline threshold of thirty hours per year is reduced to twelve. In the worst-case scenario, the potential for shadow flicker effects to impact sensitive receptors would be **moderate to significant, negative and long-term** (i.e., for the 35-year operational period).

6.6.6.2 Noise

EIAR **Chapter 13 Noise and Vibration** reports on the assessment of operational effects of the Project on the amenity of nearest sensitive receptors which applies only to noise emissions from the wind turbines and substation.

Wind turbines

A worst-case noise assessment has been completed assuming all turbines are operating in normal mode of operation and that all noise sensitive locations are downwind of all turbines at the same time. Noise prediction modelling was undertaken for all noise sensitive locations (receptors) both downwind and upwind of the proposed turbines.

Significant effects are not predicted to occur at 156 out of the 157 receptors assessed, as the predicted turbine noise levels comply with the noise criteria. Taken from the EPA EIAR Guidelines (2022)[2], a 'moderate' significance rating applies to "*An effect that alters the character of the environment in a manner that is consistent with existing and emerging*

[30] World Health Organization, Environmental Noise Guidelines for the European Region, 2022, 9789289053563-eng.pdf (who.int) (accessed 06/11/2023).

baseline trends". In the case of the predicted wind turbine noise, the effect is variable, and the assessment considers periods of the greatest potential effect (i.e., downwind conditions).

Whilst background noise levels will increase due to the wind farm development, the predicted levels will remain low (i.e., highest calculated 'downwind' turbine noise level of 41.2dB $L_{A90,T}$ at non-financially involved receptors). As a new source of noise will be introduced into the local environment there will be a general change in the background soundscape and background noise levels will increase at nearby noise sensitive receptors.

The likely significant effects from the operation of the wind turbines where receptors are upwind and downwind are summarised in **Table 6.14** (taken from EIAR **Chapter 13 Noise & Vibration**, Table 13.17 and Table 13.18).

Table 6.14: Summary of Likely Significant Operation Effects

Summary of Effects		
Quality	**Significance**	**Duration**
Downwind		
Adverse	**Not Significant**	Long Term
Upwind		
Adverse	**Not Significant**	Long Term

Based on a worst case, there will be a slight exceedance of the criteria at 6m/s (v_{10}) wind speed, during daytime periods, at only one of the noise sensitive locations (H17). The next stage of modelling was a directional analysis to identify the wind speed and direction for when this exceedance is likely to occur. At H17, **potential significant effects** have been identified at 6m/s (v_{10}) wind speed, during daytime periods (07:00 to 23:00hrs), when wind directions are 220 to 340 degrees from north (i.e., broadly westerly winds).

Substation

The calculated noise level from the substation to the nearest dwelling is 35dB $L_{Aeq,T}$ to H23 and 33dB $L_{Aeq,T}$ to H24. For other receptors the noise level predicted is significantly lower, due to additional distance.

The expected noise emissions from the proposed substation have been assessed in relation to existing baseline noise levels and related guidance such as the EPA *Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4). The EPA guidelines in particular set out a series of stringent noise limit for commercial/industrial type noise of 35 to 45dB L_{ArT}, for night and day-time periods respectively, in areas of low background noise.

The expected noise level from the substation (assuming designed to meet the target sound power) is within typical guidelines for industrial plant noise emissions to residential dwellings. The noise from the substation will not contribute significantly to the overall

noise levels associated with the operation of the proposed turbines. This noise is therefore **Not Significant.**

6.6.6.3 Landscape and Visual

EIAR **Chapter 14 Landscape and Visual** presents an assessment of the landscape and visual amenity effects which will result when turbines and related infrastructure are introduced in the landscape. The chapter concludes that the turbines would be positioned more than four times the tip height from the nearest residential properties, and beyond this distance the receiving communities have a low density, dispersed settlement pattern. Mature hedges and woodland are prevalent throughout the farmland plain in which the receiving communities are located. These provide screening such that views of the wind farm would vary being largely intermittent and on occasion highly visible although not overly dominant. In the round, when the available existing views from communities are considered and the nature of likely views of the Project, **no significant landscape and visual effects** on communities are predicted. **Table 6.15** provides a summary of landscape and visual effects on visual receptors in settlements and communities from operation of the proposed wind farm (as extracted from EIAR **Chapter 14 Landscape and Visual**, Table 14.12).

Table 6.15. Operational phase landscape and visual effects of the proposed wind farm on settlements and communities up to 20km

Receptor	Sensitivity	Magnitude	Significance	Beneficial/ Neutral/ Adverse
Visual Receptors				
Settlements and Communities				
Within 2km	Medium	Moderate/slight to Moderate	**Moderate/minor to Moderate - Not Significant**	Adverse
Within 2-5km	Medium	Moderate/slight to Moderate	**Moderate/minor to Moderate - Not Significant**	Adverse
Within 5-10km	Medium	Slight	**Minor - Not Significant**	Adverse
Within 10-20km	Medium	Slight/negligible	**Minor/negligible - Not Significant**	Adverse

6.7 Potential effects - decommissioning

The decommissioning phase of the Project is described in EIAR **Chapter 5 Project Description**. In the decommissioning phase, cranes will be used to disassemble each turbine section for their removal from the wind farm site. The upper sections of the foundations projecting above ground will be removed, and the remainder of the foundations will be covered by soils typical of the surrounding environment, then reseeded or left to re-vegetate. Underground cables will be cut back at the turbine termination points and will be recycled. Site access tracks will remain to allow access

through the site for farm operations. Decommissioning the Project will take approximately two months to complete.

The potential effects of decommissioning are like those associated with the construction phase, however reduced in magnitude.

6.7.1 Population

The potential effects associated with the decommissioning phase in relation to population and demographic trends will be similar to the construction phase. The effects on population and demographic trends during construction phase would be **temporary and imperceptible** and therefore **Not Significant**.

6.7.2 Employment

The potential effects associated with the decommissioning phase in relation to employment would be significantly reduced in magnitude to the effects predicted during construction. No construction works are required, and the specialist personnel who would disassemble the turbines are likely to come from outside the study area. There would be a limited number of direct and indirect jobs generated from decommissioning activity, with only a **short-term slight positive effect** on the employment profile of the study area, and a **short-term slight positive effect** on local businesses and services in the nearby towns and villages in the study area, and therefore **Not Significant**.

6.7.3 Land use

The proposed turbines will have a design lifetime of approximately 35 years. The operator may wish to replace turbines prior to the end of the design lifetime and continue use of the wind farm site to produce renewable electricity. Such a decision would be made following an assessment by the operator and turbine supplier, and only on approval from the local authority.

If a decision is taken to discontinue use of the wind farm site to produce renewable electricity, the turbines and any above ground infrastructure will be removed from the wind farm site, with some infrastructure (i.e., access tracks) remaining (refer to EIAR **Chapter 5 Project Description**) This will result in temporary restrictions to agricultural land use while the decommissioning works are underway. Once fully decommissioned, the lands will revert fully to agricultural use. The decommissioning works would therefore have a **temporary and imperceptible** effect on land use in the wind farm site and study area, and therefore **Not Significant.**

6.7.4 Recreation and tourism

The decommissioning works will not interact with nearby recreational facilities and tourism. It is expected that the decommissioning phase of the proposed Project will have an **imperceptible** effect on recreation amenities and tourism, and therefore will be **Not Significant**.

6.7.5 Human health

It is expected that the decommissioning phase of the Project will have an **imperceptible** effect on human health, and will therefore will be **Not Significant**.

6.8 Mitigation measures and residual effects

6.8.1 Population

The residual effects on population and demographic trends during construction, operation and decommissioning phases are imperceptible. Therefore, no mitigation measures are required, and there are no residual effects.

6.8.2 Employment

As the direct and indirect effects of the Project during construction, operation and decommissioning phases on employment and the economy are positive and beneficial, no mitigation measures are required, and there are no residual effects.

6.8.3 Land use

Residual effects on land use arising during construction, operation and decommissioning phases are not significant. No mitigation measures are required, and there are no residual effects.

6.8.4 Recreation and tourism

Residual effects on recreation and tourism during construction, operation and decommissioning phases are not considered to be significant. Therefore, no mitigation measures are required, and no residual effects will occur.

6.8.5 Human health

As described in EIAR **Chapter 9 Hydrology and Hydrogeology**, to protect groundwater quality, the pouring of concrete within the works areas will be prepared and controlled, including shuttering and the use of geotextile membrane to minimise escape of material. Once it is set, concrete is effectively inert. Once mitigated, release of cement material during construction with potential for impacting ground water quality will be minimal and temporary, if it occurs at all.

Buffers from drainage channels and karst features are observed in the design of the wind farm. These, along with best practice environmental management measures prescribed in the Surface Water Management Plan presented within the Construction Environmental Management Plan (EIAR **Volume III, Appendix 5.1**) will prevent pollution and protect surface and groundwater quality.

EIAR **Chapter 16 Traffic and Transport** concludes that following mitigation, negative effects on the receiving environment associated with the construction works on the main wind farm site and the GCR options will be **short-term** in duration and **slight** in significance, whilst the works associated with the TDR options will be **temporary** in duration and **slight** following mitigation. Traffic management measures will be put in place as detailed in EIAR **Chapter 16 Traffic and Transport** and in the Construction Traffic Management Plan (CTMP) as contained in EIAR **Volume III Appendix 5.2**. This will result in limited disruption to land use along the GCR for an anticipated duration of five months. Once best practice measures as outlined in the CTMP are followed, the

potential for negative impact on public health and safety, the residual effects are expected to be **temporary and not significant**.

In relation to air quality, all construction effects were assessed to be not significant provided that the recommended dust control and exhaust mitigation measures for construction and to a lesser extent decommissioning phase as set out in EIAR **Chapter 17 Air Quality**, section 17.6 are applied. Residual effects are therefore **not significant**.

In relation to EIAR **Chapter 18 Climate**, following the implementation of mitigation measures, due to the emission of Greenhouse Gases (GHGs) during the construction (and decommissioning activities) the Project is likely to result in a **direct, long-term minor, not significant adverse effect** on global climate (with emissions remaining in the atmosphere for a long period of time (years, decades and beyond). However, this minor adverse effect is largely outweighed by the direct, long-term significant beneficial effect of operation of the wind farm upon the global climate, such that the overall net effect of the Project, following the implementation of mitigation measures, is likely to be a **significant beneficial effect**. This is because the net GHG effects of the Project will be below zero and the Project will result in a reduction in atmospheric GHG concentration. This reduction will be brought about by the displacement of fossil fuel energy sources by the renewable energy produced by the Project. This will contribute to overall **positive effects** on human health and wellbeing of the population.

A Construction and Environmental Management Plan for decommissioning works will be followed, clear signage will be utilised on public roads and, as with construction, the community will be informed of works prior to commencement to avoid any potential negative impact to public health and safety.

6.8.6 Amenity

The potential for shadow flicker is only possible during operation of the turbines. Through the implementation of a shadow flicker control system to curtail the operation of the turbines during periods where shadow flicker could occur, impacts from shadow flicker from the turbines can be mitigated, except for a short period once the pause criterion is met and for the turbine(s) to come to a stop. Refer to EIAR **Chapter 12 Shadow Flicker**, section 12.9 which details that, based on the modelling undertaken, curtailment is likely to require curtailment of operation of Turbine 4 for 112 hours per year, and Turbine 6 for 339 hours per year in the worst-case scenario.

It is considered that the residual shadow flicker effects on all sensitive receptors (including those outside the study area) would be **short** in duration and **negligible** resulting in no significant adverse residual effects. The effect on amenity arising from operation of the turbines is therefore **imperceptible**.

In relation to noise and vibration during construction, recommended mitigation measures include best practicable means in the selection and use of equipment, work practices, and noise reduction measures at construction works sites. Following the application of mitigation measures as set out in EIAR **Chapter 13 Noise and Vibration**, section 13.10, it is concluded that the residual noise and vibration effects from construction at the wind farm site are **temporary, not significant and adverse**, whilst along the GCR options the noise and vibration effects from the proposed works are considered **brief, not significant and adverse**.

During the operational phase, noise mitigation measures will be implemented to ensure that turbine noise levels will comply with the criteria at the sensitive location H17. Curtailment is proposed only during daytime periods (07:00 – 23:00hrs), and only during particular wind directions (220 -340 degrees from north) and at a single wind speed (6m/s $_{v10}$) and to 3 turbines only (T6, T8 and T9). Following application of the proposed noise mitigation measure during the operational phase, it is considered that the likely effect is associated with the operational phase of the Project is **Not Significant**.