

Proposed Gathabawn Windfarm

Environmental Impact Assessment Report

Non-Technical Summary of the EIA Report



August 2026

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Introduction to this Non-Technical Summary (NTS)

This is the Non-Technical Summary of the Environmental Impact Assessment Report (EIA Report) which has been submitted with the Planning Application to An Coimisiún Pleanála for the Gathabawn Windfarm.

Contents of the Non-technical Summary

The Non-Technical Summary provides:

- a summary introduction to the proposed development;
- An overview of relevant policies, and the process undertaken to put together the EIAR
- the different options examined for the development;
- summary descriptions of the proposed development;
- the use of natural resources such as land, soil, water and nature, and the emissions and wastes expected;
- the environment surrounding the development specific to each environmental topic (i.e. land, soils, water, air quality, noise and shadow flicker, climate, biodiversity (habitats and animals), the landscape and visual amenity, cultural heritage, material assets (such as roads, services under roads and on overhead line, telecommunication signals, and aviation); the local population and human health. The likely effects of the project during its construction and operation and during the eventual decommissioning of the windfarm are examined in relation to each of these topics;
- The potential for the impacts from the grid connection element of the proposed Gathabawn Windfarm and of Other Projects existing or permitted, to combine with the proposed development is described;
- Summary of the key mitigation measures that will be implemented to avoid or reduce negative effects;
- The residual impacts on each of the environmental topic factors. The residual impact is the impact that will occur after the mitigation measures have taken effect.

It is a summary document, written in non-technical language, avoiding technical terms, detailed data and scientific discussion. The aim is that the Non-Technical Summary is accessible and understandable to a member of the public, who does not have a background in the environment or in-depth knowledge of the development itself. Extracts of images that feature in the Environmental Impact Assessment Report are used in this Non-Technical Summary.

NTS of EIAR Chapter 1 Introduction and Policy Context

NTS of EIAR Section 1.1 Introduction to the Planning Application

Following pre-application consultations between Ecopower Developments Limited (EDL) and An Coimisiún Pleanála in relation to a proposed windfarm in North County Kilkenny – to be called Gathabawn Windfarm, An Coimisiún Pleanála served notice that the proposed development would be Strategic Infrastructure Development (SID) and therefore any application for planning permission for the development must be made directly to An Coimisiún Pleanála (Pre-Application ABP Ref. 313780-22).

Therefore, this Planning Application has been made directly to An Coimisiún Pleanála.

The Gathabawn Windfarm Planning Application consists of a suite of Application Documents:

1. Planning Documents including the Application Form; copies of Public Notices; Cover letters to An Coimisiún Pleanála; Notification Letters to Kilkenny County Council and to Prescribed government and non-government Bodies; Planning Statement and Community Report
2. Planning Drawings pack
3. Environmental Impact Assessment Report (EIA Report), which includes this Non-Technical Summary and Photomontages visuals of the proposed turbines in the landscape
4. Construction Environmental Management Plan for the Gathabawn Windfarm
5. Appropriate Assessment Report (Stage 2 Natura Impact Statement)

A. Introduction to the Promoter

The Gathabawn Windfarm Promoter is Ecopower Developments Limited, part of the Ecopower Group. www.ecopower.ie Ecopower was established in 1996 and is wholly owned and managed in Ireland. The Ecopower windfarm development team is experienced in site investigations and site optimisation; compilation of planning applications; grid connection procurement; regulatory and policy compliance; financing and construction of windfarm projects. Additionally, Ecopower's operation and maintenance team provides an asset management and windfarm operation and maintenance service. Ecopower developed and operates five windfarms in Ireland – in Mayo, Donegal and Kilkenny, with an 84MW windfarm currently under construction in County Tipperary. Ecopower Supply sells electricity to households and businesses throughout Ireland.

The Non-Technical Summary has been compiled and written by Phil Kenealy, EIA Report Coordinator ((Dip. EIA) of Ecopower Developments with 30-years experience in the planning and development of the Ecopower windfarm development and operational portfolio.

NTS of EIAR Section 1.2 The Gathabawn Windfarm Proposal

The Gathabawn Windfarm Location

The proposed Gathabawn Windfarm is located entirely within County Kilkenny, with the wind turbines located on two areas of high ground – at Ballylehaun and at Ballyring. The nearest village is Gathabawn village which is 1km southeast from the nearest Ballylehaun turbine and 3km west from the nearest Ballyring turbine. Lisdowney village is located 3km to the northeast of the nearest Ballyring turbine, and 6km from the Ballylehaun turbines. The town of Ballyragget is located 6km northeast of Ballyring and 10km east of Ballylehaun, while the town of Johnstown is located 6km from Ballylehaun and 9km from Ballyring.

In neighbouring County Laois, Cullahill village is located 3km north of the nearest Ballylehaun turbine and 6km northwest of the nearest Ballyring turbine, while Durrow town is located 9km to the northeast of the nearest turbines.

The windfarm will be sited in the townlands of Coolnacrutta, Glashare, Ballylehaun, Gorteennamuck, Rathlogan, Ballyring Upper, Ballyring Lower and Tentore.

The windfarm site is characterised as rural open countryside with lands enclosed by hedgerows or stone walls. There are farmsteads and one-off housing located along the local roads and generally the commercial, civic and community services are in the surrounding small towns and villages. Farming in the area is predominantly grassland supporting dairy and beef cattle and to a lesser degree sheep farming and tillage.

Figures of interest in the EIAR Report

- Figure 5.01.2 Proposed Gathabawn Windfarm Location on Discovery Mapping
- Figure 5.01.1 to Figure 5.01.4 Construction Phase Layout on Aerial Photography Mapping

Figures are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

The Gathabawn Windfarm Proposal

The proposal is to build a windfarm, ancillary and associated works including:

- Twelve (12) wind turbines with a rotor diameter of 136m. Two hub heights are proposed – 82m for Turbine T6, T7 & T9, and 102m for all other turbines, thus giving an uppermost tip height of 150m for T6, T7 & T9, and 170m for all other turbines. Construction of 12 No. turbine foundations and adjacent hardstandings;
- Site roads of 8km in total length, comprising 6.3km in length of new roads and the upgrading and widening of 1.3km of existing private farm tracks;
- Two (2) electrical Control Buildings - one in the Ballylehaun area and one in the Ballyring area. The buildings measure 20m x 10m, with a height of 7m and contain electrical and communications equipment, along with a storage room, canteen and welfare facilities;
- Underground electrical cabling linking the wind turbines together into a turbine 'string' and ultimately connect these strings to the two Control Buildings;
- One (1) 30m lattice tower mast and one (1) LiDAR unit for measuring on-site meteorological conditions;
- Seven (7) site entrances from the public road, comprising both existing and newly created entrances;

- Temporary haul route works to facilitate the transport of the large components to the turbine locations. These works comprise temporary access road; some minor public road widening; temporary hardstanding area; and temporary widening of existing field entrances off the public road;
- Installation of an integrated drainage system to manage surface water run-off during all phases of the proposed development;
- All associated infrastructure, services and ancillary site works including excavation, earthworks, temporary and permanent overburden storage berms; temporary and permanent fencing; and hedgerow and tree removal, reinstatement and enhancement;
- Two (2) temporary construction compounds and two (2) on-site temporary borrow pits;
- Creation of a Biodiversity area for the protection, enhancement and creation of habitats to serve as a functioning high level biodiversity resource for local flora and fauna communities.

The Gathabawn Windfarm Grid Connection

The grid connection point for the proposed Gathabawn Windfarm, has not yet being confirmed by Eirgrid but is likely to be the Eirgrid Ballyragget Substation, circa 7km to the east of the proposed windfarm site. This grid connection (to be called Candidate Gathabawn Grid Connection in the EIA Report) comprises underground cabling along the public road c. 5.6km in length between the control buildings a cross-country underground cable route from the Ballyring Control Building to Parksgrove townland, 8.8km to the east. Also includes the construction of a new substation and substation compound at Parksgrove and then a further 1.5km of underground cabling from Parksgrove to the Eirgrid Ballyragget Substation at Moatpark townland.

The Candidate Gathabawn Grid Connection is not included as part of this Planning Application, it will be subject to a separate Planning Application, at a future date. The Candidate Gathabawn Grid Connection is considered in this EIA Report in order to facilitate the cumulative evaluation of the whole Gathabawn Windfarm project.

The Purpose of Gathabawn Windfarm

The proposed Gathabawn Windfarm is aligned with National and International policy to transition to a carbon neutral future, necessitated by an ever increasing imperative to ameliorate climate change. The generation of electricity from a clean, renewable source like the wind is a core component of these policies.

The renewable electricity generated at Gathabawn Windfarm will contribute positively to climate action targets by generating electricity without polluting greenhouse gas emissions which are the primary cause of accelerated climate change.

Gathabawn Windfarm Contribution to Climate Action

- **Saving 38,250 tonnes of carbon dioxide equivalent (CO_{2e}) per year.**
- **The equivalent square kilometres of forestry** required to sequester the same amount of CO_{2e}, as the offsets from Gathabawn Windfarm is **31 square kilometres**
- **The number of diesel/petrol cars** that would emit the equivalent amount of CO_{2e} per annum as that offset by Gathabawn Windfarm is **22,238 cars**
- **Predicted production: 150,000,000 Kilowatt hours (kWh)** of electricity per annum which is **enough to supply 33,237 homes.**

See more about the Gathabawn Windfarm proposal on the community website at www.ecopowergathabawn.ie. The project promoters can be contacted through the website.

NTS of EIAR Section 1.3 Policy Context of Gathabawn Windfarm

A. European Policy

Versailles Declaration and RepowerEU Emergency Plan: Relevant to Gathabawn Windfarm, REPowerEU recognises the central role of wind energy: the EC wants 510 GW of wind energy capacity installed by 2030, up from 190 GW today.

Regulation (EU) 2022/2577: Renewable electricity generated at Gathabawn Windfarm will support the Regulation EU 2022/2577 plans for indigenous European Union renewable electricity supplies.

Renewable Energy Directive III: The Renewable Energy Directive 2009/28/EC is the legal framework for development of renewable energy across all sectors of the European Union economy supporting clean energy cooperation across EU countries. Significantly, RED III recognises renewable energy as an overriding public interest. The proposed Gathabawn Windfarm development is a RED III development. Renewable electricity generated at Gathabawn Windfarm, will support Ireland in reaching its legally binding obligations under RED III of achieving at least 42.5% of energy requirement from renewables by 2030.

European Green Deal: The aim of this policy is to make Europe climate neutral by 2050. In 2021, the European Climate Law made greenhouse gas emission targets a legal obligation. These targets were increased from 40% to 55% by 2030.

Water Framework Directive: The Water Framework Directive assessment report, appended to the Water Chapter of the EIA Report, demonstrates that the proposed Gathabawn Windfarm development will not result in a risk of deterioration on any waterbody (rivers, lakes, groundwaters, transitional and coastal) either qualitatively or quantitatively, or on a temporary or permanent basis, or otherwise jeopardise any waterbody in reaching its Water Framework Directive objectives.

B. National Policy

The Irish government is creating and implementing policies and strategies to achieve its long-term goal of transitioning to a low-carbon, climate-resilient and environmentally sustainable economy by 2050 and advance progress and action in global climate ambition.

Climate Action Plan 2025 (CAP25)

Renewable electricity generated at Gathabawn Windfarm, will align with Ireland's Climate Action Plan CAP25 and will contribute positively to the increasing imperative to ameliorate climate change by generating electricity without polluting greenhouse gas emissions. Overall, based on analysis in the EIA report, it is demonstrated that the development of Gathabawn Windfarm is consistent with Section 15 of the Climate Act and promotes the stated goals and objectives of CAP25.

National Planning Framework: Project Ireland 2040

An overarching objective of this framework is to foster a transition toward a low carbon, climate-resilient society, which reflects the policy ethos established at the European level. The Framework acknowledges that greenhouse gas emissions from the energy sector must be reduced by at least 80% by 2050 when compared to 1990 levels, while ensuring a secure supply of energy exists. The provision of new renewable electricity generation at Gathabawn Windfarm, is in line with the aims and objectives of the Framework.

National Development Plan 2021-2030

One of the National Development Plan's strategic climate priorities is the need for low-carbon, resilient electricity systems; specifically, the Plan commits to increasing the share of renewable electricity up to 80%

by 2030. Gathabawn Windfarm will support the priorities of the Plan by providing renewable electricity from wind energy to the national grid, supporting the achievement of a low-carbon and resilient Irish electricity system.

Energy Security - National Energy Security Framework (April 2022)

The Framework addresses Ireland's energy security needs in the context of the war in Ukraine. It coordinates energy security work across the electricity, gas and oil sectors. The Framework takes account of the need to decarbonise society and the economy and takes account of targets set out in the Climate Action Plan to reduce emissions.

Theme 3 - Reducing our Dependency on Imported Fossil Fuels, focusses on three areas of work:

- Reducing demand for fossil fuels.
- Replacing fossil fuels with renewables, including solar energy.
- Diversifying fossil fuel supplies.

Gathabawn Windfarm will support the Framework's intentions to reducing demand for fossil fuel and replace fossil fuels with renewables.

The Fourth National Biodiversity Action Plan (NBAP) 2023-2030

The NBAP five Objectives are as follows:

1. Adopt a whole-of-government, whole-of-society approach to biodiversity
2. Meet urgent conservation and restoration needs;
3. Secure nature's contribution to people;
4. Enhance the evidence base for action on biodiversity; and
5. Strengthen Ireland's contribution to international biodiversity initiatives.

The EIA Report and AA Report for the Gathabawn Windfarm development examines the impact of the development on biodiversity, including species and habitats, having regard to the Habitats and Birds Directives, Environmental Impact Assessment Directive, Water Framework Directive and other relevant European, National and Local legislation, strategy and policy on the protection of biodiversity.

Wind Energy Development Guidelines

The Wind Energy Development Guidelines 2006 siting and design considerations for 'Hilly & Flat Farmland' were taken into account during the design stage of Gathabawn Windfarm. The final design is compatible with these guidelines.

The Draft Revised Wind Energy Development Guidelines 2019 siting and design considerations are the same as in the 2006 Guidelines.

C. Regional Policy

The Southern Regional Assembly - Regional Spatial and Economic Strategy is supportive of the future growth of renewable energy technology in the region and sets a clear precedent to identify and capitalise on those opportunities associated with the transition to renewable energy generation. Gathabawn Windfarm as an electricity generator from renewable resources in County Kilkenny, is compatible with these objectives.

D. Local - Kilkenny County Development Plan Policy

Kilkenny City and County Development Plan (KCCDP) 2021-2027

The Kilkenny City & County Development Plan (KCCDP) 2021-2027, provides for the development of indigenous energy resources, with an emphasis on renewable energy supplies. The Plan acknowledges the importance of renewable energy in reducing greenhouse gas emissions from human activity and the contribution of renewable energy in achieving national and EU target of net zero greenhouse gas emissions by 2050.

Gathabawn Windfarm is compatible with the Strategic Aim of Chapter 11 of the KCCDP to generate 100% of electricity demand from renewables by 2030 and supports the Objective to integrate renewable energy sources and ensuring our energy system remains safe, secure and ready to meet increased demand.

According to the government's Climate Change Advisory Council, it is estimated that by 2030, County Kilkenny will use 633 Gigawatt hours (GWh) of electricity each year. The latest figures from Wind Energy Ireland, show that Kilkenny generated 107GWh of electricity in 2025 from wind turbines located in the County. Gathabawn Windfarm will deliver an estimated 140 GWh per annum of renewable electricity to assist in reaching the KCCDP Strategic Aim target and the Objective to increase production.

Gathabawn Windfarm is compatible with the Assessment and Development requirements for windfarms as set out in Chapter 11 of the KCCDP.

KCCDP Locational Requirements for Wind Energy Developments

The Plan supports the development of renewable resources including wind energy, in suitable locations in the County. The proposed development location is identified as a suitable location for wind energy development in the Wind Energy Strategy for the County. The developer has also identified the site as suitable for the development of a windfarm due to elevation and scale, absence of designated sites and national grid connection possibilities.

Within County Kilkenny, the Council's Wind Energy Strategy identifies key areas where there is significant wind energy potential and grid connection capacity, where - subject to criteria such as design and landscape planning, natural heritage, environmental and amenity considerations, wind energy development will be either acceptable, open for consideration or not permissible.

Gathabawn Windfarm is within an area where wind energy developments are considered 'Acceptable in Principle' and where the Strategy states that Acceptable in Principle areas are *"preferred area for wind energy development, characterised by high wind speeds, and no significant conflict with environmental designations or sensitivities"*.

Also, according to the expert who prepared the landscape chapter for the EIA Report, the location is also compatible with the Wind Energy Development Guidelines siting and design criteria for 'Hilly & Flat Farmland' which describes the windfarm site.

E. Laois Policy – Laois County Development Plan

The Laois County Development Plan (LCDP) identifies a number of protected scenic views and prospects in the vicinity of the proposed Gathabawn Windfarm, including views towards Knockmannon Hill, Caponellan Hill, Cullahill Castle, Mass Lough, and Ballymartin Hill.

A landscape and visual impact assessment was undertaken to evaluate the potential effects of the windfarm on these views (V004, V014, V021, V022 and V023 in the Landscape assessment). Overall, the assessment concludes that while the development would introduce some visual change within designated scenic views,

the predicted effects are generally limited, ranging from imperceptible to moderate in magnitude, and do not indicate a substantial adverse impact on the wider landscape character of County Laois.

In terms of ecological constraints, the proposed windfarm site is **not located within any European-designated nature conservation site**, meaning there would be no direct effects on protected Natura 2000 areas.

F. Financial Contribution to the Area

Community Benefit Scheme

The Department of Environment, Climate and Communications currently operates the Renewable Electricity Support Scheme (RESS), to promote the generation of electricity from renewable sources. Under RESS rules, participating windfarms in the scheme must contribute €2 per megawatt-hour of electricity produced to a Community Benefit Fund. For Gathabawn, this is estimated at around €300,000 per year. The fund would provide ongoing financial support to the local area through:

- Near-neighbour payments
- Grants to local community groups

A Gathabawn Windfarm Community Fund of circa €300,000 per year will be created and distributed based on the RESS rules, irrespective of whether the windfarm participates in RESS or other Government price support scheme or not.

G. Commercial Rates to Kilkenny City & County Council Local Authority Area

Commercial rates payments to Kilkenny County Council of circa €800,000 per annum are predicted for an operational Gathabawn Windfarm, for the lifetime of the windfarm delivering a positive benefit to the people of County Kilkenny.

NTS of EIAR Chapter 2 EIA Report Process and Presentation

NTS of EIAR Section 2.1 The EIA Directive

The Environmental Impact Assessment (EIA) of projects is governed by the European Union EIA Directive. The EIA Directive requires that projects that are likely to have significant effects on the environment be made subject to assessment by the planning authority, prior to planning permission being granted.

As Gathabawn Windfarm is the type of project that must be assessed under the EIA Directive requirements by the planning authority, the developer must submit an Environmental Impact Assessment Report (EIA Report) prepared by experts, with the Planning Application to inform the assessment by the planning authority.

NTS of EIAR Section 2.3 and Section 2.4 The EIA Report

Ecopower Developments arranged for all the consultations, site investigations, development designs and technical investigation to be carried out; appointed engineering and scientific experts to prepare the specialist environmental factors or topic chapters for the EIA Report; co-ordinated the assembly and presentation of the EIA Report and carried out continuous reviews of the EIA Report.

The following environmental topics must be studied in the EIA Report

- Land, Soils, Water, Biodiversity (Nature)
- Air Quality and Climate
- Landscape, Cultural Heritage;
- Material Assets (roads, telecommunications)
- Noise and Vibration and Shadow Flicker
- Population and Human Health.

The EIA Report focuses on any likely significant effects of the project by identifying sensitive aspects of the environment which have potential to be affected by the development.

The assessment process considered the

- environmental topic specific publications; legislation or regulatory controls
- replies to pre-application consultations from An Coimisiún Pleanála; Statutory Bodies and other parties who were likely to have specific concerns; landowners involved with the development and the local community; and
- expert fieldwork and desktop studies.

Suitable study areas are identified, relevant to each environmental topic and each sensitive aspect. The environmental topic experts then identified possible impacts on the environment from the proposed windfarm. Mitigation measures (environmental protection measures) were developed to avoid, reduce or eliminate any identified potential to cause significant effects. The impact of the proposal after mitigation was deployed, was evaluated. This is called the residual effect.

Cumulative Evaluations have been carried out. The whole Gathabawn Windfarm project is made up of separate elements – the Windfarm and the Grid Connection. Although the grid connection is not included in this application, the whole project is taken into consideration cumulatively in each of the topic chapters in

the EIA Report. Other unrelated projects and activities that are existing or permitted in the area were also evaluated cumulatively. This includes the nearby Lisdowney Windfarm.

NTS of EIAR Section 2.5 Evaluation Methodology

The environmental topic chapters are generally carried out in accordance with that topic's best practice industry guidelines. Where specific best practice guidelines are not available or not applicable, then the topic experts have used the guidance provided in the *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022) and an evaluation method called the IMPERIA ARVI method (Appendix 2.1 of the EIA Report (describes this method).

The methodology used to describe the baseline environment and to quantify the significance of the impacts of the proposed development, is appended to each chapter.

NTS of EIAR Section 2.6 Descriptive Terminology Used in this EIA Report

The evaluations in the EIA Report use defined meanings generally used in EIA Reports. These terms are listed in the EPA Guidelines on the 'Information to be contained in Environmental Impact Assessment Reports' (2022). The key terminology is presented below:

Quality of Effect	Description
Positive Effect	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities)
Neutral Effect	No effect or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effect	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).
Probability of Effect	
Likely Effect	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effect	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of effect	
Residual Effects	The impact that will occur after the proposed mitigation measures have taken effect.
'Do Nothing' Effect:	The environment as it would be in the future should the project not be carried out.
Duration of Effect	
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Frequency of Impacts	How often the effects will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Significance of Effect	
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 Impacts	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Impacts	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant Impacts	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant Impacts	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound Impacts	An effect which obliterates sensitive characteristics

For the purposes of this EIA Report, effects rated as being ‘Significant’, ‘Very Significant’ and ‘Profound’ are considered to be significant in EIA terms. Effects rated as being ‘Moderate’ are effectively significant or not significant, subject to professional judgement, and Effects rated as ‘Imperceptible’, ‘Not Significant’ and ‘Slight’ are considered to be not significant in EIA terms.

NTS of EIAR Section 2.7 Presentation of the EIA Report

Ease of reading, clarity and structure were key considerations during chapter preparation and review to produce an EIA Report that is concise and well-integrated across the environmental topic chapters.

The appendices and mapping used to present the information are included at the end of each topic chapter.

Red font is used to cross reference to the appendices and figures.

A list of chapter figures, appendices and a glossary of terms is included at the start of each chapter of the EIA Report.

NTS of EIAR Chapter 3 Consultation

NTS of EIAR Section 3.1 to Section 3.10: Consultation with An Coimisiún Pleanála, Kilkenny County Council and Various Other Bodies

Starting in 2022, during the design of the Project and later during the preparation of the EIA Report, consultations regarding the proposal were carried out either in-person or by writing between the EIA Project Team and

- An Coimisiún Pleanála
- Kilkenny County Council
- Laois County Council
- Developments Application Unit - National Monument Service and National Parks and Wildlife Service
- Inland Fisheries Ireland
- Transport Infrastructure Ireland
- Uisce Éireann
- Irish Aviation Authority
- Office of Public Works

Their considerations informed the design and the specific issues to be examined/resolved in EIA Report.

Other statutory and non-government bodies with an interest in the environment, were contacted as prescribed by An Coimisiún Pleanála and provided with details and mapping on the proposed development, but did not get involved with the pre-application consultation.

NTS of EIAR Section 3.11 Community Engagement for Gathabawn Windfarm

A. Direct engagement with the Local Community Pre-Application

The following local community in the rural hinterland of the windfarm, were identified for direct consultation

- Residences within 2km of a proposed turbine
- Community Groups including rural development groups; community centres; residential care facility; community café; childcare facilities and community councils; local churches
- Sporting Groups – GAA; Soccer; Handball; Boxing; Squash
- Elderly facilities – Meals on Wheels service
- Local County Councillors - Members of Kilkenny County Council for the Municipal District of Castlecomer and Members of Laois County Council for the Borris-in-Ossory-Mountmellick area.
- National Schools and Post-Primary Schools in the area

B. Community Liaison Officer

A Community Liaison Officer – CLO is appointed and a dedicated email address is set up contact@ecopowergathabawn.ie

C. Project Newsletter

All houses within 2km of the nearest proposed turbine received a newsletter with the distance of the nearest turbine to their residence noted and an invitation to seek more information from Ecopower through the CLO, on areas of concern. This distance was chosen because these houses are within the study area for noise (study area 2km) and shadow flicker (study area 1360m). This area includes Gathabawn village. The Newsletter included

- Introduction to the Promoter - Ecopower
- The reason for the Gathabawn Windfarm site selection
- Introduction to the Environmental Impact Assessment Report (EIA Report) that has been prepared and what topics were studied
- The appointed CLO Community Liaison Officer's email and post address details
- Introduction to the Gathabawn Windfarm dedicated community website www.ecopowergathabawn.ie
- Description of the windfarm proposal, location and likely grid connection
- Details on the Planning Application and the Strategic Infrastructure Development status; where the Planning Application can be viewed in person or online; how to make a submission and the final date for those submissions; reminder that the public will be notified by newspaper notice and site notice of Ecopower's intention to make the Planning Application. Invitation to contact the CLO with any queries or feedback.
- Timelines for the Gathabawn Windfarm development
- The Construction phase haul route for construction materials and turbine components
- The methodology for assessing operating turbine noise and the results of the assessment, are summarised
- Shadow Flicker is explained, the possibility of occurrence and the mitigation available should it occur, is summarised.
- The benefits of Gathabawn Windfarm should it be constructed, are summarised under the headings Climate Action; Security of Supply and Community Gain i.e. the Community Benefit Fund
- A Site Layout map is included showing the turbines in relation to the local roads in the vicinity so that residents can find their houses in relation to the proposal.
- Contact Details are listed again.

D. Email Newsletter

An email newsletter was sent to community groups active in the Gathabawn and wider area. The email included a summary of the proposal and a location map; details of the website where more information can be found; the CLO email address and the amount of the Community Benefit Fund. Community Groups contacted included Community Development and Service Groups, Sport Groups, Youth and Elderly services, Public Representatives, Local Schools and Churches.

E. Advertisement in Kilkenny People

An advertisement was placed in the local newspaper – Kilkenny People, providing summary information on the forthcoming planning application and including contact details and the community website address.

F. Community Website

A dedicated community website www.ecopowergathabawn.ie was set up prior to submission of the planning application. This website set out

- a description of the proposal

- a description of the need for the project in the context of Climate Mitigation
- the estimated community benefit accruing from the development including the community benefit fund and commercial rates payable
- the policy context of the development – International, National and Local policy
- details on participating in the planning process for the development
- summary of the topics covered in the EIA Report attaching to the planning application
- link to the non-technical summary of the EIA Report
- general resources and facts about wind energy in general.

Contact details for getting in touch directly with the Community Liaison Officer for the development, are prominently displayed on the website.

G. Community Engagement post-application

Gathabawn Windfarm is committed to engagement with the local community and interested groups post-application, during all phases of the life cycle of the windfarm i.e. construction, operation and decommissioning. The dedicated Community Liaison Officer (CLO) for the development has been appointed for the full life cycle of Gathabawn Windfarm. The CLO's contact details are published on the community website www.ecopowergathabawn.ie

H. Post-Application, during the public submissions period

Provision of information on the community website www.ecopowergathabawn.ie and in the Planning Notice (Newspaper and Site Notice). Information on how to make submissions during the planning process and the method, timeline and cost of making those submissions is provided.

I. Post-Planning if planning is granted - Construction

Information about the construction schedule will be provided on the community website www.ecopowergathabawn.ie The CLO will contact neighbouring residents, that may be affected by increased traffic and turbine component deliveries.

J. Post-Planning – Operation, Community Benefit Fund

The CLO will be a contact point for complaints or queries relating to the operation of the windfarm. There will be advertising placed on the community website and local newspapers of the opening of the Community Benefit Fund and an invitation to get involved in the administration of the fund. Meetings will be held with interested local groups in a timely manner prior to the operation of the fund, to explain the whole fund process and to support the administration of the fund.

K. Gathabawn Windfarm Annual Report

An Annual Report will be prepared. The Report will outline the various methods which were used to keep the local community updated, any issues which arose and how these were dealt with. The Report will be published on the community website and a copy will be made available to the local community and local authority, if requested.

L. Community Report for Gathabawn Windfarm

The Gathabawn Windfarm Community Report has been submitted to the Planning Authority as a stand-alone report as part of the Application. It is intended as a resource to be read by the local community to understand the context of developing a windfarm in their area and also provide information on the consultation that has taken place with their community.

Read in conjunction with this Non-technical Summary of the EIA Report, it should provide enough information to the Local Community to bring about an understanding of the policy context and need for the development of windfarms in Ireland and provide clear information on the Gathabawn Windfarm proposal and the expected local and environmental impacts and benefits that will accrue. The intention is that this information will facilitate constructive engagement during the planning process.

The Community Report has been submitted as part of the Planning Application documents Pack. A link to the Community report will be included on the community website www.ecopowergathabawn.ie

NTS of EIAR Section 3.12 Public Consultation via the Planning System

A. An Coimisiún Pleanála Website

Prior to the submission of a Strategic Infrastructure Development Planning Application, the Applicant is required to enter into Pre-Application consultation with the An Coimisiún Pleanála to confirm if the proposal qualifies as a Strategic Infrastructure Development. Once decided, the Commission publishes the decision in weekly lists of new Strategic Infrastructure Development cases, on their website. The Gathabawn Windfarm Pre-Application Decision Notice can be found at <https://www.pleanala.ie/en-ie/case/313780>

When the Planning Application is submitted to An Coimisiún Pleanála, the full application documents are accessible on the Commission's website at www.pleanala.ie and can be viewed at their offices in 64 Marlborough St, Rotunda, Dublin 1. The full Planning Application is also available on a dedicated planning website www.gathabawnwindfarplanning.ie

Any submission/observation on the application must be made to An Coimisiún Pleanála within the period specified. The Coimisiún Pleanála website provides information on how the public can make a submission/observation, either online or in writing about the application. An Coimisiún Pleanála is obliged to take the public's views into account when deciding on an application.

B. Kilkenny County Council Offices

A copy of the Planning Application will also be available to view at the offices of Kilkenny County Council.

C. Notification on the EIA Portal

Because the Gathabawn Windfarm application is accompanied by an EIA Report, the public must be notified on the EIA Portal hosted by the Department of Housing, Local Government and Heritage, prior to the lodging of the application. The EIA Portal is an online map-based website that provides users with information on current/pending applications for development consent which are accompanied by an EIA Report. Notice was provided to the public through the EIA Portal on the Gathabawn Windfarm application. The web link for the EIA Portal is <https://experience.arcgis.com/experience/a1a85d92623147b191dd25a14b2571da>.

D. Public Notices

The public was also notified of the intention to apply for planning permission by

- the erection of Site Notices in the vicinity of the proposed development
- publication of a newspaper notice in the Kilkenny People and the Irish Independent

Information on how to make a submission to An Coimisiún Pleanála on the planning application is provided on the newspaper and site notices.

The public was also notified of the planning permission on the dedicated community website www.ecopowergathabawn.ie. The Non-technical Summary for the proposal is also available on the community website. Information on how to make a submission to An Coimisiún Pleanála on the planning application is provided on the community website along with the contact email for the Community Liaison Officer for the development.

NTS of EIAR Chapter 4 Alternatives Considered

In accordance with the EIA Directive on the assessment of the effects of certain public and private projects on the environment, this chapter of the EIAR comprises a description of the reasonable alternatives studied by the developer for Gathabawn Windfarm. The alternatives studied are relevant to the proposal and its specific characteristics. An indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects is also included.

Guidance from Ireland's Environmental Protection Agency (EPA) and the EU on the information that should be included in an EIA Report in accordance with the EIA Directive, was consulted.

The Alternatives considered for the Whole Gathabawn Windfarm Project and the reason for choosing that alternative based on environmental comparison are set out in the table below.

Topic	Proposal	Alternative Considered	Comparison of Environmental Effects
Designated Sites	The access road between T2 and T3 at Ballylehaun and it was proposed to cap with limestone.	To minimise dust soiling impacts on the SAC, the access road has been moved away from the SAC boundary to a minimum of 5m, and it is now proposed to pave this access road with tarmac to remove the source of dust – i.e. aggregate fines.	This road is adjacent to the Cullahill Mountain SAC boundary, the alternative as considered the preferred option when effects on the Designated Site was considered
Designated Sites/ Biodiversity	Two turbines were oversailing the boundary of Cullahill Mountain SAC, with one of these turbines and its associated hardstand located adjacent to the southern boundary of the SAC.	One of these turbines was dropped to avoid oversailing the SAC as it could not be moved, while the other turbine, the proposed turbine T3, was moved 70m away from the boundary of the SAC.	The alternative considered is the preferred option when effects on Designated Sites are compared.
	An area of hazel wood north of the access road between T2 and T3 was allocated as a Biodiversity Enhancement Area to be protected and managed for the lifetime of the Gathabawn Windfarm.	The area allocated for biodiversity enhancement was purchased by the National Parks and Wildlife Service and now forms part of the Gales Hill Nature Reserve.	The alternative considered – i.e. to secure the protection of a hazel wood further south was the preferred option when effects on Biodiversity are compared.
Cultural Heritage	The site road to access the Ballylehaun Area was routed through a ringfort listed on the Record of Monuments and Places (RMP) (KK008-031---). (this ringfort was not easily discernible at surface level)	Following a geophysical survey of the infrastructure areas in 2023, this access road was dropped to avoid impacting this RMP site. Access to the Ballylehaun Area via the local road L58141 was selected as the preferred option.	The alternative considered is the preferred option when effects on Cultural Heritage are compared.
	The site road between T8 and T9 at the Ballyring Area was routed through the Zone of Notification for an enclosure listed on the RMP (KK009-023----)	This site road has been moved away from the Zone of Notification for this enclosure to minimise any potential impacts on the asset.	The alternative considered is the preferred option when effects on Cultural Heritage are compared.
	Blade set down areas were proposed for each turbine location.	Turbine blades for T3 and T5 at the Ballylehaun Area will be delivered just-in-time, to avoid the need for blade set down areas beside these hardstands. This minimises the extent of drystone wall removal and medieval field boundary removal that would	The alternative considered is the preferred option when effects on Cultural Heritage are compared.

Topic	Proposal	Alternative Considered	Comparison of Environmental Effects
		otherwise be required for the construction of temporary infrastructure.	
		The layout of access roads and hardstands at the Ballylehaun Area have been micrositied to minimise felling of veteran hawthorn trees which record the remnant of historical field boundaries.	The alternative considered is the preferred option when effects on Cultural Heritage are compared.
	It was considered that turbines T6 and T7 would have a rotor diameter of 136m and a hub height of 102m, giving an uppermost tip height of 170m.	The hub height for these two turbines has been reduced to 82m, thus reducing the uppermost tip height to 150m. This change allowed turbine T6 and T7 to be moved further to the east to minimise visual and setting impacts on a ringfort listed on the RMP (KK009-006----), whilst still achieve a four times tip height from neighbouring houses	The alternative considered is the preferred option when effects on Cultural Heritage are compared.
Material Assets	The Candidate Gathabawn Grid Connection was routed along the public road through Lisdowney village.	The Ballyring-Parksgrove Underground Cabling element of the Candidate Gathabawn Grid Connection is now routed primarily across private lands and avoids the public road through Lisdowney village to minimise disruption to road users and avoid construction works outside Scoil Bhríde National School.	The alternative considered is the preferred option when effects on Material Assets and Local Communities are compared.
	The Candidate Gathabawn Grid Connection was routed to cross the River Nore within the pavement of the N77 bridge over the River Nore, and through Ballyragget town to the R432.	There are already services within this bridge. In addition, this route would have resulted in disruption of traffic in Ballyragget town. The Parksgrove-Moatpark Underground Cabling element of the Candidate Gathabawn Grid Connection is now routed to cross the River Nore by Horizontal Directional Drilling under the riverbed. There is precedent for this method of crossing the river. (e.g. recent Briskalagh Windfarm consent)	The alternative considered is the preferred option when effects on Material Assets are compared.

Topic	Proposal	Alternative Considered	Comparison of Environmental Effects
	The option to connect the Candidate Gathabawn Grid Connection to the national grid by connecting into the existing Lisheen 110kV substation was explored.	Due to insufficient capacity to connect to the Lisheen Substation, it is instead considered that the Candidate Gathabawn Grid Connection will connect to the national grid at the existing EirGrid Substation in Moatpark.	The alternative considered is the preferred option when effects on Material Assets are compared.
	A turbine delivery route to the Ballyring Area from the motorway network at Portlaoise via Durrow, Co. Laois was considered.	Works to facilitate the delivery of turbine components through Durrow would require the removal of 4 no. trees and the temporary removal of a historic water pump, and disruption within the town. It is now proposed to deliver the turbine components to the Ballyring Area by first delivering the turbines to the Temporary Blade Storage Area at the Ballylehaun Area, and transporting them to the Ballyring Area via the local road network L1803, L1804, temporary access road, and the L1806 and L18062, thereby going straight through Durrow on the R639 and avoiding the requirement for aforementioned turbine facilitating works in the village.	The alternative considered is the preferred option when effects on Material Assets and Local Communities are compared.
	A turbine delivery route to the Ballyring Area from the motorway network at Urlingford via Freshford, Co. Kilkenny was considered.	This haul route was not chosen due to constraints on the turbine delivery route within Freshford.	The alternative considered is <u>not the preferred option</u> when effects on Material Assets are compared
	The possibility of sharing the part of the grid connection route, in particular where it crosses the River Nore and the N77 at Ballyragget, with Farranrory Windfarm is examined as an alternative grid connection method	An alternative grid connection method was selected which would involve the construction of a new substation in Parksgrove. This substation, will be built to Eirgrid specifications and as such will be future proofed to accommodate a second generator connection, without any further need for construction works in proximity to the River Nore.	This alternative considered is the preferred option when effects on Designated Sites are compared.

NTS of EIAR Chapter 5 Description of the Development

Chapter 5 of the EIA report, describes the

- Location, size and design of proposed Gathabawn Windfarm and the other elements of the whole project
- Payments of commercial rates and community benefit fund
- The predicted use of natural resources, offsets of carbon emissions, other emissions and wastes associated with the project
- The life-cycle stages - including construction, operation and decommissioning
- A description of the environmental management of the project and
- Other projects and activities which have been considered for cumulative effects.

Chapter 5 of the EIA Report contains thirty-seven (37) Figures, illustrating all the individual aspects of the proposal including location, layout, turbine drawings, substation drawings, site entrance and haul routes for materials and component deliveries. There are also Figures of the likely Grid Connection method so that a cumulative assessment can be made.

There are three (3) appendices to Chapter 5 including Site Photos and Drone Footage; Turbine Delivery Route Assessment; and list of the other projects that were considered for cumulative effects.

Figures and Appendices are also available on the dedicated planning website
www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 5.1 and Section 5.2 Overview and Location

The Proposed Development - Gathabawn Windfarm comprises 12 turbines which are proposed for 2 areas – Ballylehaun area (7) and Ballyring area (5). In addition to the turbines and their hardstanding areas, the windfarm development also includes site access roads, 2 Control Buildings; 1 met mast, underground cabling, temporary works to facilitate turbine deliveries, and other associated and ancillary works.

The location of the proposed Gathabawn Windfarm is set out in the table below.

Table 5-1: Location of the various parts of the Proposed Gathabawn Windfarm

Gathabawn Windfarm	Townland	Elevation (m)	Landuse /Land cover
Windfarm - Ballylehaun Site			
Turbine T1	Coolnacrutta	153	Agricultural grassland
Turbine T2	Glashare	143	Agricultural grassland
Turbine T3	Ballylehaun	224	Agricultural grassland
Turbine T4	Ballylehaun	246	Agricultural grassland
Turbine T5	Ballylehaun	236	Agricultural grassland
Turbine T6	Gorteennamuck	210	Agricultural grassland
Turbine T7	Gorteennamuck	231	Agricultural grassland
Met mast	Rathlogan	194	Agricultural grassland
Ballylehaun Control Building	Ballylehaun	199	Agricultural grassland
Windfarm - Ballyring Site			
Turbine T8	Ballyring Upper	222	Agricultural grassland
Turbine T9	Ballyring Lower	224	Agricultural grassland
Turbine T10	Ballyring Upper	208	Agricultural grassland
Turbine T11	Tentore	194	Agricultural grassland
Turbine T12	Ballyring Upper	178	Agricultural grassland
LiDAR unit	Ballyring Upper	226	Agricultural grassland
Ballyring Control Building	Ballyring Upper	202	Existing hardcore area
Turbine Delivery Facilitating Works			
Temporary Access Road and Temporary Road Widening	Foyle South, Coolcashin, Garrydague	130 - 160	Agricultural grassland

The grid connection point has not been confirmed by Eirgrid but the likely point is the existing Ballyragget Substation. A separate Planning Application will be made for the grid connection once the connection point is known. The effects of the likely grid connection is assessed in this Planning Application (called the Candidate Gathabawn Grid Connection).

The Candidate Gathabawn Grid Connection is also located in County Kilkenny and is routed along the public road between Ballylehaun and Ballyring, and across private lands between Ballyring and the existing Eirgrid Ballyragget Substation in Moatpark. A new electrical substation to be located beside the N77 national road in Parksgrove townland.

NTS of EIAR Section 5.3 Size and Design of the Gathabawn Windfarm

A. Predicted Electricity Production from Gathabawn Windfarm

The amount of electricity a wind farm produces depends on how windy the site is. By using long-term weather information, including data on wind speed and direction, the developers can estimate how much electricity the wind farm is likely to generate each year.

For the Gathabawn Windfarm, the estimate is around **150 million kWh of electricity per year**.

This estimate is then used to work out:

- how much **greenhouse gas emissions the windfarm could help avoid**;
- approximately how many **homes** could be supplied with electricity; and
- how much money could be provided through the **Community Benefit Fund**.

B. The proposed Wind Turbines

The wind turbines proposed are the latest turbine technology available on the Irish market, that are suitable for the Gathabawn Windfarm site.

The proposed turbines will have a rotor diameter of 136m. Regarding hub heights, two hub heights are proposed – 82m for Turbine T6, T7 & T9, and 102m for all other turbines, thus giving an uppermost tip height of 150m for T6, T7 & T9, and 170m for all other turbines.

Turbines of this size are a typical size of turbine currently being installed on-shore in Ireland

The wind turbines will require a reinforced concrete foundation of c.20m diameter and c.3.2m in depth.

Inter-turbine spacing was considered in the windfarm design within the context of the development site including the lay of the land, distance from houses, landholdings and presence of European designated sites for nature. Based on the turbine technology on the market today, for optimum performance, windfarms are designed spaced apart 2-3 rotor diameters at a minimum and 5-6 rotor diameters at a maximum. The rotor diameter of the proposed turbine is 136 meters. The inter-turbine spacing at the proposed Gathabawn Windfarm are at least 3-rotor diameters apart in the Ballyring area and between 3 and 6 rotor diameters apart in the Ballylehaun area. These spacings are well within the parameters of international wind farm design standards.

C. Windfarm Site Roads

The project will involve about **8 km of roads** in total – **6.7 km of new roads** being built and **1.3 km of existing private farm tracks** being widened and improved.

The roads will be **4.5 metres wide** with some bends made wider, so that the turbine parts can be transported to the site. They will be built using layers of crushed stone and strong, hard-wearing stone laid over a supporting fabric layer.

D. Met Mast and LiDAR

The proposal involves installing two pieces of equipment to collect wind and weather information—a 30-metre-high mast at Ballylehaun and a smaller ground-based device at Ballyring.

E. Windfarm Control Buildings

Two electrical control buildings will be built—one at Ballylehaun and one at Ballyring. Their purpose is to collect and manage the electricity generated by the wind turbines and the cables connecting them. Each building will be within a 600 m² fenced compound and the building will measure 20m long × 10m wide and 7m high. The buildings will contain electrical and communications equipment, as well as a storage area, canteen and toilet/welfare facilities. The toilets will use an integrated rainwater harvesting system.

F. Site Entrances

The windfarm site will be accessed from the public road, through six existing entrances and one newly created entrance – seven entrances in all. The entrances will be setback 2.4m from the road and existing trees and hedgerow on either side will be removed/pruned as required in order to provide sightlines in either direction. The entrances are numbered 1-7 and are located in the following townlands

1. Entrance in Coolnacrutta off the L-58141
2. Entrance in Glashare off the L-58141
3. Entrance in Gorteennamuck off the L-1803
4. Entrance in Ballylehaun off the L-5818
5. Entrance in Ballyring Upper off the L-18062
6. 2nd entrance in Ballyring Upper off the L-18062
7. Entrance in Ballyring Upper / Tentore off the L-18062

G. Facilitating Works along the Turbine Delivery Route

The turbines will be delivered from the port using the motorway network as far as the Portlaoise M7/N77 interchange and from there the turbines will be transported down the N77, straight through Abbeyleix and Durrow towns, onto the R639 and straight through Cullahill village before turning left off the R639 onto the L58141 at Coolnacrutta. No works or activities are required in Abbeyleix, Durrow or Cullahill to facilitate the movement of the turbine components through these towns and village.

An assessment of the turbine delivery route has been carried out and a number of pinch points were identified in the vicinity of the windfarm site, and temporary works are proposed to facilitate the transport of the large components to the turbine locations at these points. These temporary works are set out below

Access into the Ballylehaun site

- FW1: Temporary access road in a field in Coolnacrutta/Glashare to provide access off the R639, onto the L58141
- FW2: Permanent widening of 495m on the southern side of the L58141 by 0.5m to 2m and further down the L58141, permanent widening of 80m into the northern verge by 0.5m to 2m
- FW3 and FW4: Temporary widened of site entrance No. 1 and No. 2 off the public road
- FW5: Temporary road in field at the turbine T1 location
- FW6: A temporary hardstanding area (4090m²) will be constructed in a field at the Ballylehaun site, close to Site Entrance No.2. This area will provide a temporary set down area for turbine parts.

Access to the Ballyring site

- FW7: Temporary widening of Site Entrance No.3 in Gorteennamuck exiting the site to turn onto the L1803

- FW8: Temporary access road through fields in the townlands of Foyle South and Coolcashin to provide access to the L1804 to the L1806
- FW9: Temporary widening of the L1806 local road into a grassland field in Garrydague
- FW10: Temporary hardcore area in a grassland field at the junction of the L1806 and L18062 to facilitate turning into the Ballyring site
- FW11: Permanent widening of 620m of the L18062 by up to 1m into a grassland field.
- FW12: Temporary site access roads in a field accessing Turbine T8

Most of the facilitating works are temporary and the land and road boundaries will be reinstated following the completion of the turbine transportation. Any existing field drains will be reinstalled along the newly widened roadside boundaries.

H. Windfarm Site Drainage

An integrated drainage system will be installed to control rainwater and runoff from the site, throughout the construction and operation of the development. Clean flow from rivers and streams will be diverted around the works area. Water containing silt or sediment from the works area will be prevented from reaching rivers and streams by collecting these waters and routing them through sediment control systems and settlement ponds and once settled, releasing the clean water slowly over the site.

Once construction is finished, temporary drainage will be removed and the construction areas restored, while drainage needed for the permanent windfarm will stay in place.

I. Temporary Construction Compounds

Two temporary construction compounds will be set up at the beginning of the construction stage – one in Glashare townland, accessed via Site Entrance No. 2 and one in Ballyring Upper townland, accessed via Site Entrance No. 5. The compounds will accommodate site parking; site offices and canteen; storage areas for construction materials and waste; bunded area for oils and fuels and a toilet block containing integrated sealed wastewater holding tanks.

J. Temporary Borrow Pits

Construction stone – approx. 26,000m³, will be won from two on-site borrow pits by rock breaking - blasting is not expected to be required. There will be one borrow pits in Ballylehaun and a second in Ballyring Lower. Suitable rock and fill material will also be extracted from turbine foundation and hardstanding locations, and this will also be used to construct the base layers of windfarm road and hardstands, therefore, the volumes of stone required to be won from the borrow pits may be lower. Once the rock has been extracted, the borrow pits will be reinstated to the same level as the surrounding ground level and replanted with native plant species.

K. Overburden Storage Berms

The soil removed during construction will be stored in piles (berms) beside the turbine areas and along some access roads. Most of this soil will be temporarily stored and then reused to restore the construction areas. Some soil piles will remain permanently and will be planted with native grasses and flowering plants.

L. Fencing

Temporary fencing will be installed around the boundaries of construction works, to protect the adjoining lands by preventing the encroachment of workers, machinery, or materials. After construction, a permanent fence will be erected around the turbines and the site access roads.

M. Hedgerow and Tree Removal, Reinstatement and Enhancement

To provide bat buffer zones around the turbines and to facilitate the delivery of the large turbine components, 3,700m of hedgerow and 10 trees will be removed during the construction works.

The same amount of hedgerow will be replaced at locations agreed with the project ecologists, to provide alternative foraging habitat, restore habitat connectivity to bat species, and enhance and create habitat for other animals. The replacement hedgerow will include 100 new trees. A mix of native fruiting hedge species will be used comprising hawthorn, blackthorn, holly, hazel, guelder rose, spindle, crab apple and bird cherry. New trees will comprise a mix of native species such as oak, alder, birch, crab apple, bird cherry and rowan.

Additionally, 1,300m of existing hedgerow will be improved by interplanting new hedging into gaps in the existing field boundary.

N. Biodiversity Areas – Protection, Creation, Enhancement

To replace the habitat lost to the permanent features of the windfarm (6.6 hectares), it is proposed to provide new and enhanced biodiversity areas at the windfarm site through the protection, enhancement and creation of habitats for the benefit of local plants and animals. These Biodiversity Areas will be protected and managed for the duration of the operating windfarm. The plans include;

- 1.7ha of agricultural land and 5.3 hectares of hazel woodland will be secured for the operational lifetime of the Gathabawn Windfarm and managed to improve wildlife and biodiversity.
- At Ballyring, 1 hectare of agricultural land will be planted with native trees and plants to create areas of richer wildlife habitat.
- At Ballylehaun, 0.7 hectares will be used to create a 15m wide and 500m long wildlife corridor, linking the 5.3 hectares of hazel woodland with the hazel woodland within the Gales Hill Nature Reserve.
- The 5.3 hectares of hazel woodland will be protected for the lifetime of the windfarm, with no felling or removal of trees.
- The biodiversity areas will be fenced to allow wildlife to move freely while keeping livestock out.
- The areas will be regularly managed by removing invasive plants and controlling tree growth and ground cover to maintain and improve the wildlife habitats.

O. Reinstatement Works

Once construction is finished, the temporary construction facilities and work areas will be removed and the land restored using the stored soil from nearby areas. Temporary drainage systems will also be removed. Fencing will remain temporarily until the land has regrown and recovered. Permanent fencing will then be installed along the windfarm roads and around the turbines.

NTS of EIAR Section 5.4 Size and Design of the Candidate Grid Connection

The grid connection is not part of the Planning Application but is described and evaluated in the EIA Report so that the whole project can be considered by the Commission and the public. The grid connection will be submitted for planning permission when the connection point is confirmed by Eirgrid.

In summary, the Candidate Gathabawn Windfarm Grid Connection includes the construction of a new substation compound at Parksgrove townland and underground cabling between Control Buildings at the windfarm site to Parksgrove and then on to the existing Ballyragget Substation.

The Substation at Parksgrove will comprise a hardcore compound yard containing control buildings, lightning protection monopoles, underground cabling and overhead wire and other electrical equipment and apparatus.

The underground cabling between Ballylehaun Control Building and Ballyring Control Building will be 5.6km in length under the L5818, L5821, L5820 and L1806, and the L18062. From the Ballyring Control Building, underground cabling, 8.8km in length, will connect the Gathabawn Windfarm to Parksgrove Substation. A cross-country route is proposed, with just 200m along the public road corridor where the cable route crosses some local roads. The Parksgrove Substation will be connected to the Eirgrid Ballyragget Substation by underground cabling, c.1.5km in length, which will cross the Ballyragget to Durrow Road and the River Nore and then go through agricultural lands and a short length of public road as far as the EirGrid Substation at Moatpark, north of Ballyragget town. The cabling will cross five watercourses as far as Parksgrove and will cross under the River Nore to connect the Parksgrove Substation to the Eirgrid Ballyragget Substation.

NTS of EIAR Section 5.5 Annual Financial Contributions

Commercial rates payments to Kilkenny County Council of c.€800,000 per annum, for the lifetime of the windfarm will deliver a positive benefit to the people of County Kilkenny.

Within the local area, the local community will directly benefit from the **Gathabawn Windfarm Community Benefit Fund which will be circa €300,000 every year**. The Community Benefit Fund will be managed locally and distributed to near neighbours and to local community organisations such as clubs, schools, tourism and community projects, sport and home energy efficiency programs, in line with the Government's Renewable Energy Support Scheme (RESS) Community Benefit Fund Good Practice Principles Handbook. However, the Community Benefit Fund will be paid every year irrespective of whether the Windfarm participates in RESS or other Government price support scheme or not.

Annual land lease payments of 670,000 during the operational phase to local landowners.

NTS of EIAR Section 5.6 Use of Natural Resources

A. Windtake

The Lisdowney Windfarm is the closest existing windfarm to the proposed Gathabawn Windfarm.

In general, to preserve optimal performance and to account for turbulence and wake effects (an effect called Windtake), a separation distance needs to be observed between any proposed turbines and any existing turbines on lands neighbouring the proposed development site. The Wind Energy Development Guidelines on Windtake recommend a minimum separation distances between proposed turbines and existing turbines on a neighbouring site of 3 rotor diameters in a crosswind direction and 7 rotor diameters in the downwind direction – that would be 408m in a crosswind direction and 952m in a downwind direction for the proposed Gathabawn turbine rotor size.

The proposed Gathabawn Windfarm turbines will be compliant with the Wind Energy Guidelines on Windtake, because the minimum separation distances between the proposed turbines and the nearest Lisdowney Windfarm turbines, will be greater than 3 rotor diameters in a crosswind direction and greater than 7 rotor diameters in the downwind direction.

B. Land

The Gathabawn Windfarm site is proposed for agricultural lands. Within the Construction Works Area, 59 hectares are located on agricultural lands. The agricultural lands are mostly set to permanent grassland. **During operation the permanent hardstanding footprint (including the turbines) will reduce to 6.6 hectares.**

For the grid connection, within the Construction Works Area, 14 hectares are located on agricultural lands. **Following the completion of construction works, the only above ground features will be the Parksgrove Substation and the new access road over the cabling in Moatpark, comprising a total landtake area of 0.8 ha.**

C. Soil & Rock

Excavations

Approximately 26,000m³ of stone will be won from two new on-site borrow pits. The Borrow Pits will be reinstated at the end of construction.

In total (including stone won from the borrow pits), approximately 116,000m³ of soil and rock will need to be excavated during construction of the Gathabawn Windfarm. Most of the excavated material will be reused on site for building the turbine hardstands and access roads; restoring temporary construction areas and reinstating the borrow pits.

The construction of the Candidate Grid Connection is expected to require the excavation of approximately 14,200³ of soils from cable trenches and jointing chamber excavations along the cable routes and 6,800m³ of soils excavated at the Parksgrove Substation site.

Imported Rock

Smaller amounts (c.8,000m³) of higher-grade hard-wearing rock will be required for road capping and surface finishing, which will be imported from local quarries. In addition, crushed stone will be imported to backfill cable trenches and for the Parksgrove Substation compound.

D. Water

During construction, water for toilets and welfare facilities will be brought in and stored in tanks at the temporary construction compounds and portable welfare units. Drinking water will be provided in bottles at the construction compounds.

During operation, water for welfare facilities will mainly come from rainwater harvesting systems at the control buildings. The need for drinking water during operation will be very low, with bottled water brought to the site by staff as required.

E. Biodiversity

The dominant habitat at the whole Gathabawn Windfarm site is improved agricultural grasslands. These agricultural grasslands provide food and food byproducts to the agri-food sector and also provide habitat for various species of flora and fauna. However, improved agricultural grassland is not of very high biodiversity value. During construction, work will take place across 58 hectares of agricultural land. 3,700m of existing hedgerows and 10 trees will be removed and the equivalent amount of hedgerow will be replanted and 100 young native trees will be sown. A further 1,300m of existing hedgerows will be improved by planting new hedgerow species into gaps, helping to increase biodiversity across the site.

During operation, to offset the permanent hardstanding footprint, seven (7) hectares of high value habitat will be created, managed and protected.

NTS of EIAR Section 5.7 Emissions

A. Greenhouse Gases

The potential for greenhouse gas (GHG) emissions to air arises during the full life cycle of the development.

Energy Balance: A wind turbine uses energy to make, transport, install, operate and eventually remove it. The energy payback period is the time it takes for the turbine to generate the same amount of energy that is used throughout its life cycle – from manufacturing the turbine, building the windfarm and operating the turbine. For the type of turbines proposed for Gathabawn Windfarm, **it is estimated that this energy will be recovered within 5.3 months of operation. After that point, the turbine is generating more energy than was required to produce and operate it.**

Return on Energy is another way of describing it - over its lifetime, **a wind turbine is expected to produce around 40 times more energy than was needed to manufacture and operate it.** That means that for every 1 kilowatt hour (kWhr) of energy used to produce the turbine, it is expected to generate around 40 kWhrs of electricity.

Offsets of Greenhouse Gases Emissions during operation

The twelve wind turbines at Gathabawn Windfarm are estimated to generate c.150,000,000 Kilowatt hours of electricity per annum. This electricity will be generated without emitting greenhouse gases (GHG) and will avoid an equal amount of electricity being generated from gas or oil, which do emit GHGs. The electricity produced at Gathabawn Windfarm will be enough to supply 33,237 homes in County Kilkenny and County Laois with clean, green electricity and will avoid emission of 38,250 tonnes of greenhouse gases being emitted to the atmosphere.

B. Other Emissions to Air

Dust: During the construction phase, some dust will arise from the transportation of stone; movement of delivery vehicles; the movement of excavated materials, and from stored excavated materials.

During the operational phase, there will be minimal excavation required, dust emissions will be negligible. During the decommissioning phase, there is potential for some dust.

Noise: During construction, noise will arise from construction activities and from heavy machinery, equipment and vehicles at works areas.

During the operational phase, operating turbines will emit noise. Modern turbines have sound optimisations modes available as part of the windfarm software, which can be deployed to reduce the noise from the operating turbine, if required to protect residential amenity.

Vibration: During construction, the use of heavy machinery and rock breaking equipment will cause negligible levels of ground vibration in the immediate vicinity of groundworks, and it is not expected that blasting will be required at the works areas, including the borrow pits.

Once operational, there are no discernible vibrations from a windfarm; the level of vibrations from wind turbines are so small that they are almost impossible to detect.

Shadow Flicker: During the operational phase, rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun's rays. This can result in an annoyance indoors when the shadow is cast over the windows of a dwelling. Shadow flicker effect is dependent upon the proximity and relative position of the turbine(s) to the property window(s), in combination with weather conditions (i.e. presence of direct sunlight, adequate wind speed to turn the turbine blades and wind direction to turn the rotor towards the dwelling) and the time of day and year (i.e. dawn and dusk or when

the sun is low in the sky and shining through the rotor blades). Shadow Flicker from operating turbines can be predicted by a shadow flicker control module in the turbine software. All the Gathabawn Windfarm turbines will be fitted such a module, which will enable individual turbines to be turned off, if the permitted shadow flicker limits are about to be exceeded at a local residence.

Light: During the construction and decommissioning phases, lighting will be used at the temporary construction compounds, these lights will be of a cowled design and will be fitted with motion sensors. Lights will not be left turned on overnight. Occasionally lights will be used at works areas if required to complete a work task.

During the operational phase, for security purposes, external lighting will be used at the Ballylehaun and Ballyring Control Buildings. The lighting will be of a cowled design along with motion-sensor and timer-controlled lights, which will not remain turned-on overnight. Selected turbines will also have aviation lights installed according to Irish Aviation Authority recommendations. Motion-sensor lights will also be fitted over the turbine doors.

Electromagnetic Fields: Electrical objects and anything connected to them produce two types of fields - electric fields and magnetic fields. Electric and magnetic fields (EMF) are produced in all residential and working environments because of electrical wiring, electrical appliances, power lines and telecommunication masts, among other things. During the operational phase, like all operating indoor and outdoor electrical equipment, the operational wind turbines, underground cabling and equipment in the control buildings will be an additional source of electromagnetic fields in the environment, however these levels will be substantially below recommended thresholds, set out by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

NTS of EIAR Section 5.8 Waste

The greatest potential for waste arises during the construction phase of the project.

Wastewater: Welfare facilities including self-contained toilets, with integrated wastewater storage tanks, will be provided for construction workers at the temporary construction compounds. Following the completion of construction, welfare facilities will be provided at the Control Buildings. These facilities will be self-contained and will use a closed wastewater system.

General and Chemical Wastes: During construction, materials such as pallets, packaging, excess construction and building materials and small quantities of chemical waste, such as solid waste oils and oily rags will be generated at windfarm works areas. All waste will be removed regularly, by appropriately licenced waste contractors.

General and chemical waste will arise in small quantities during the operational phase and will be removed appropriately from the site.

NTS of EIAR Section 5.9 The Construction Phase

The commencement of construction culminates from what can be a lengthy process typical of wind energy development in Ireland. In that context, the Applicant is seeking a 10-year duration of planning period during which the Knocknamona Windfarm development can be constructed.

A. Construction Duration, Personal, Materials, Haul Route & Works

The construction of the whole Gathabawn Windfarm will take approximately 12 – 18 months to complete. It is planned to construct all elements of the whole development at the same time, i.e. including the grid connection.

In total, approximately 120 workers will be engaged in the civil, electrical, project management, legal and financial services, material supply and deliveries for the development.

Normal construction times will be between 07.00 to 19.00hrs Monday to Friday and 08:00 to 16:00hrs on Saturdays.

Construction materials will include concrete, aggregate, turbine components, reinforcing steel, electrical equipment and cabling, and general building materials.

Delivery vehicles for construction materials will comprise standard HGV units. Large turbine components will be delivered using specialist HGVs, semi-trailers and blade transport trailers.

In total, c.2,719 HGV no. loads of materials and 124 no. specialised abnormal loads will be delivered to the Gathabawn Windfarm site, split approximately 60:40 between the Ballylehaun and Ballyring Areas.

In total, c.887 no. HGV loads of materials will be delivered to Candidate Gathabawn Grid Connection, with aggregates and concrete delivered directly to works locations along cable routes and at the substation site.

Construction materials delivery routes: Stone aggregates and concrete will be imported from local suppliers. Other materials and general building supplies will be sourced from the wider regional area. The haul route for all building materials for the windfarm is as follows;

- Ballylehaun Area – from the R639 Durrow to Johnstown Road, turning onto the L58141 local road at Coolnacrutta/Glashare and accessing the works areas using the site access roads.
- Ballyring Area – from the N77 Durrow to Ballyragget Road, turning onto the L1807 road at Parksgrove, through Lisdowney village and continuing along the L1806 and turning onto the L18062 at Ballyring Upper.

Turbine Delivery Route: Delivery of turbine components require abnormal (wide/long) loads. From the port of entry, turbine components are transported on special extendable flatbed semi-trailers.

Delivery to the Ballylehaun Area: The turbine component transportation vehicles will use the motorway network as far as Portlaoise, at which point they will travel along the N77 as far as Durrow, Co. Laois. The vehicles will then follow the R639 Durrow to Johnstown Road before accessing the Ballylehaun Area via the local road at Coolnacrutta and accessing the turbine locations via Site Entrances at Glashare and Gorteennamuck.

Delivery to the Ballyring Area: The Ballyring turbines will be delivered by the same route but will then be laid down at a Temporary Blade Storage Area (beside Ballylehaun Construction Compound). Once ready to be transported to the Ballyring Area, the blades will be lifted by crane onto a specialised blade-lifter trailer, and will travel along the Ballylehaun site roads to Site Entrance No.3 at Gorteennamuck, travelling through Gathabawn village and continuing on the L1804, and then turning left onto the L1806 via a new temporary access road at Foyle Bridge, travelling along the Lisdowney Road as far as the junction with the L18062 in

Ballyring Upper, utilising the temporary widening at the junction to turn onto the L18062, and accessing the Ballyring turbines from Site Entrance No.7 at Ballyring Upper/Tenore.

A Traffic Management Plan will be implemented for the duration of the construction phase.

Main Construction Works & Activities:

Works at the Windfarm Site: Preparation of the site entrance and the temporary construction compound; opening of the borrow pits; upgrade of the existing farm roads and construction of new roads; construction of the turbine hardstandings and foundations; construction of the temporary facilitating works for turbine deliveries; installation of structural steel, concrete pouring and backfilling of the turbine foundations; delivery of the turbine components and cranes; erection of the turbines; construction and installation of underground cable circuits; construction and erection of the meteorological mast & LiDAR unit; construction of the control buildings and associated hardcore compounds; installation of electrical equipment and apparatus at the turbines and at the Control Buildings; commissioning the turbines and underground cabling; reinstatement of the borrow pits, and reinstatement of temporary works areas; removal of temporary construction and drainage works, and completion of the final drainage regime. Following completion of the works the reinstatement, replanting, permanent fencing and Biodiversity Area creation and protection works will commence.

Works at the Grid Connection Sites: The main works and activities at the Candidate Gathabawn Grid Connection will include:

For the Parksgrove Substation - construction of temporary construction compound; excavation and construction of the substation compound footprint, including earthing and ducting, transformer bund and plinth foundation works; construction and fit out of control buildings, delivery and installation of the main transformer, installation of outdoor electrical equipment and apparatus; electrical works and installation at the substation compound, testing and commissioning.

For Underground Cabling - cable trenching and jointing chamber installations; setting of underground cable across watercourses and drainage networks along cable routes; construction of new access road in Parksgrove and Moatpark; horizontal directional drilling under the N77 and under the River Nore; cable pulling and jointing, and finally commissioning. Reinstatement of lands will follow completion of the works.

NTS of EIAR Section 5.10 The Operational Phase

Gathabawn Windfarm is expected to have a lifespan of at least 35-40 years, and therefore planning permission is sought for a 35-year operational period. The lifespan of wind turbines has been increasing steadily in recent years and allowing this duration by planning condition will maximise the greenhouse gases offset potential of the windfarm. Leaving the wind turbines in-situ until the end of their useful lifespan would make the most sense from an environmental viewpoint.

At the end of the permitted operational life of the windfarm could

- obtain planning permission to continue operating as is;
- replace the old turbines with the latest wind turbine technology at the time; or
- the turbines and apparatus can be dismantled (decommissioned), taken off-site and the site restored to grassland.

The Grid Connection Parksgrove Substation and the underground cabling, will be taken over by EirGrid as part of the National Grid as such will remain permanently in place and will not be decommissioned.

A. Operational stage

Wind turbines operate automatically, responding by means of equipment and control systems to changes in wind speed and direction. Turbine output, performance, wind speeds and fault alarms are monitored off-site by the Windfarm Asset Manager.

B. Routine maintenance

Routine maintenance works will include regular scheduled inspection, testing and servicing and unscheduled repairs of the wind turbines; regular inspection and annual maintenance of the windfarm control buildings, inspection of the underground windfarm cabling; inspection and maintenance of the windfarm site roads and windfarm drainage network; maintenance of the site entrances; and scheduled biodiversity related activities such as the fencing maintenance, vegetation density control and planting.

C. Major Component Replacement

As the windfarm ages, component replacements are required. The gearbox and generator are likely to be changed at least once during the operational lifetime of a turbine. Blade replacement is less common, conservatively perhaps one blade per turbine during the operational life. Major component replacements will take place from the hardcore windfarm footprint.

The Gathabawn Grid Connection Parksgrove Substation or underground cabling will require very little on-site maintenance or inspection activities.

D. Operational personnel

Operational windfarms require repair and maintenance, providing certainty of employment for skilled workers in communities across Ireland. Windfarms by their nature, are located in regional rural areas, and there is a thriving windfarm operation and maintenance sector in Ireland, working from regional hubs throughout the country. Operation & Maintenance activities at Gathabawn Windfarm will require 3-4 skilled electrical and mechanical wind turbine and high voltage technicians.

The operational phase of the Gathabawn Windfarm will also involve Asset Managers who provide a variety of services to the windfarm including Site Manager, Health & Safety, Financial including landowner payments, Regulatory compliance, Energy sales and Community Benefit Fund management, payments and liaison. Gathabawn Windfarm asset management will require 1 No. full-time job equivalent.

E. Imported Operational Materials

Minimal materials will be imported during the operation stage. The traffic generated during the operational phase of the project will be very low.

NTS of EIAR Section 5.11 The Decommissioning Phase

A. The decommissioning process

Where the windfarm is to be decommissioned, decommissioning would take between three and four months, completed by multiple specialist crews working in tandem. There would be approximately sixteen workers on-site altogether.

The plant and machinery required would include cranes for dismantling the turbines and HGVs and specialist extendable trailers to remove the turbines and electrical equipment from the site. Also required would include small excavators, dump trucks, front loaders etc. and machinery and equipment for reinstatement works.

Works and activities to decommission the windfarm would take place predominantly from the hardcore windfarm footprint. The decommissioning process would involve;

- Decommissioning and dismantling electrical equipment, plant and apparatus;
- Removal of underground cables;
- Dismantling the turbines and removal from site;
- Removing electrical equipment from the control buildings;
- Reinstatement and restoration of the windfarm site.

Dismantling the Plant Electrical plant and apparatus are mostly composed of steel and cast iron with some metals for wiring and rare earths for magnets. All the electrical plant and apparatus in the turbines and in the windfarm Control Buildings would be decommissioned, drained of hydrocarbon fluids, if present, and transported to be

- re-used as second-hand plant or
- segregated into materials and repurposed into other electrical plant or parts or
- recycled and recast in its original form.

The cabling comprises aluminium, copper and steel cabling surrounded by polymers. Cables similarly would either be re-used, re-purposed into other cabling, recycled and recast in its original forms.

Turbines would be dismantled by crane using the same process as erecting the turbines. **Eighty-five to ninety per cent of a dismantled wind turbine can be recycled because the towers, generators and gearboxes are mostly made up of steel and iron and copper, which is easy to recycle and for which there is an active circular economy market in Ireland and Europe.**

Wind turbine blades cannot be reused in their original form but can be recycled. Three main methods are:

- Grinding (to be reused as filler in cement, artificial wood or asphalt)
- Incineration (to generate electricity or to heat cement kilns) and
- Repurposed (street furniture, bicycle shelters, bridges and walkways on cycle paths; in playgrounds as ramps, slides and tunnels; and for reefs and motorway sound barriers). These uses will be expanded in the coming years as part of the turbine manufacturer's environmental, social, governance (ESG) and sustainability programmes.

Operating fluids or lubricants used in turbine generator, converter, gearbox, hydraulic system, rotor bearings and in the transformer would be collected and can be recycled usually by refining and reconditioning as base oil.

During decommissioning, transportation of the turbine parts off site may require the same temporary road and access improvements used during construction.

Restoration of the Windfarm Site following decommissioning: The new and widened site roads would be left in place if they are of use to the landowners. The windfarm control building would be decommissioned, and electrical plant and apparatus removed, however the building and hardstanding area could remain in place for farm use. The turbine foundations would be left in situ because their removal would require extensive excavations and, in any case, set and cured concrete is a stable material.

All turbine areas would be restored which would involve covering the turbine foundation and hardstanding areas with topsoil which was stored in the permanent overburden storage berms alongside the hardstands and site access roads during the construction of the windfarm. Followed by filling in drainage channels at turbine locations and reseeded the area with native grass species.

All restored areas will be graded and landscaped sympathetically with the site contours. Restoration and revegetation of the site will be carried out under the supervision of a suitably qualified ecologist.

The cost of decommissioning is fully covered by the scrap value of the plant and equipment. There is also a market for second-hand turbines. At present commodities prices, the sale of the steel, aluminium and copper recovered from a dismantled turbine exceeds the cost of dismantling the turbine and reinstatement of the site – an excess of €15,700 of value of the decommissioned plant and equipment over the cost of the decommissioning itself.

NTS of EIAR Section 5.12 Environmental Management of the Whole Gathabawn Windfarm Project

A. Mitigation & Monitoring

Mitigation measures to avoid, prevent or reduce, or, if possible, offset any significant adverse effects of Gathabawn Windfarm on the environment, have been developed. Monitoring will be carried out to check that the development in practice conforms to the predictions made and to record any unforeseen effects to undertake appropriate remedial action.

B. Environmental Management Plan

An Environmental Management Plan has been prepared for the whole Gathabawn Windfarm. The purpose of this plan is to communicate environmental protection measures that apply during the various phases of the whole development to those with responsibility for carrying out works.

The plan will be reviewed and updated as required throughout each stage of the development to ensure it contains the latest relevant information, environmental commitments, mitigation measures and monitoring arrangements.

C. Environmental Clerk of Works

An Environmental Clerk of Works will be employed for the duration of the pre-construction, construction and for early (c.6 months) operational stages. The Environmental Clerk of Works will be adequately resourced and will manage an adequately staffed team of Environmental Managers and environmental specialists and will monitor the compliance of the construction works with the Environmental Management Plan and all relevant planning conditions. **The Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works at a works location** to avoid or react to an unforeseen adverse environmental event. Works will not be allowed to recommence until the issue is resolved.

NTS of EIAR Section 5.13 Projects included in the Cumulative Evaluations

The cumulative evaluations considered the following;

A. Off-Site Projects/Secondary Projects

Off-site projects are separate physical works or facilities that are required by the main project and usually located outside the main project's site boundary. The Candidate Gathabawn Grid Connection is an offsite project and is included in the baseline descriptions and cumulative impact evaluations in the EIA Report as part of the whole Gathabawn Windfarm project. No other projects are required in order to develop the windfarm.

B. Secondary Projects

The existence of the Parksgrove Substation (*should it be permitted and constructed*) could result in other energy projects, such as solar farms, windfarms, and battery energy storage projects seeking to use the Parksgrove Substation to connect onto the national electricity system. This is also considered in the cumulative evaluations.

C. Other Projects & Activities considered for Cumulative Evaluation

The following Other Projects were scoped in for cumulative evaluation with Gathabawn Windfarm, in EIAR topic chapters:

Other Project	Status	Closest Gathabawn Turbine	Separation Distance
Lisdowney Windfarm	operational	T8	1.25km
Seskin Windfarm	under appeal, ACP	T9	4.7km
Lisheen Windfarm	operational	T2	8.8km
Bruckana Windfarm	operational	T2	10.5km
Ballynalacken Windfarm	consented	T9	10.6km
Ballybay Windfarm	operational	T6	12.8km
Briskalagh Windfarm	consented	T12	13.5km
Kyleballyoughter Windfarm	under construction	T12	13.8km
Cnoc Windfarm	operational	T6	14.2km
Foylatalure Windfarm	operational	T12	14.2km
Pinewood Windfarm	under construction	T9	15.9km
Littleton Windfarm	in-planning	T5	16.5km
Farranrory Windfarm	under construction	T12	17.6km

Other Project	Status	Closest Gathabawn Turbine	Separation Distance
Potential Killoshulan Windfarm	pre-planning	T6	2.4km
Potential Fassa Windfarm	pre-planning	T9	14.5km

In relation to community benefit funds the following projects are included in the Population chapter:

- Parksgrove Solar Farm
- Ballynalacken Windfarm
- Seskin Windfarm
- Briskalagh Windfarm
- Bruckana Windfarm
- Keatingstown Solar Farm
- Moyne Solar Farm
- Potential Killoshulan Windfarm(pre-planning)

NTS of EIAR Chapter 6 Land

In Chapter 6: Land, land and landuse are addressed. Land relates to the portion of the earth's surface not covered by water, while landuse relates to the various ways in which society uses land. Certain development undertakings can change current landuse.

The Land evaluation was carried out by Andy Dunne (B.Agr.Sc., M.Sc.(Agr.)), director of **Environmental Agricultural Engineering Consultancy (EAEC)**, a firm of agricultural and engineering consultants.

Consultation and desktop studies were carried out to gather information. The information used to compile this chapter was gathered from reports and documents generated by local authorities and statutory agencies, with responsibility for Land, including the Department of Agriculture, Food and the Marine, the EPA and Kilkenny City & County Development Plan 2021-2027 and from **site visits**. The evaluation for Land has been carried out in accordance with Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), along with the ARVI approach for impact significance assessment developed under the EC IMPERIA LIFE11 Project.

Figures of interest in the EIAR Report

- Figure 6.1 Land Cover Mapping

Figures are also available on the dedicated planning website www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 6.2 Sensitive Aspects of Land

From a land, and land use perspective, the existing environment is rural countryside. The wind farm site is mainly made up of permanent grassland used for farming, which is typical of the surrounding area. There are also some commercial forestry plantations nearby. The wider area includes regional and local roads, as well as private access roads serving nearby homes and farms.

The effects on the following sensitive aspects of Land were studied **Agricultural Land; Public Amenity Land and Equestrian Land**.

The **study areas** for agricultural land are the landholdings within which the works are located. The study area for **Public Amenity Land** is amenity areas and access routes to amenity areas; and the study area for **Equestrian Land** is three times tip height from the turbines.

NTS of EIAR Section 6.3 Baseline Environment

Agricultural Land: The Gathabawn Windfarm site is located in a rural area where farming is the main land use. The areas required for construction are all on agricultural land, mostly permanent grassland, with smaller areas of tillage and existing farm tracks. Farming has been established in the area for many years and is mainly focused on dairy and beef cattle, with some sheep farming and tillage.

Access to farmland is generally provided through existing farm entrances from the surrounding local road network. A total of 25 agricultural landholdings are involved in the proposed wind farm development, with most of the landowners living and farming locally.

One of the landholdings also contains an area of hazel woodland which is not grazed by cattle. Other woodland and protected grassland habitats occur outside the wind farm site, including areas associated with

Cullahill Mountain SAC. These environmentally sensitive areas are considered separately in more detail in the Biodiversity Chapter.

The lands involved in the Candidate Grid Connection works are also predominately agricultural grassland.

Public Amenity Land: There are public recreational amenity areas proximate to the development site, consisting of looped walkways and a community garden, however all of these amenities are located outside of the Proposed Gathabawn Windfarm site boundaries.

Equestrian Land: Two landowners involved in the Gathabawn Windfarm development use their lands for horse training and breeding. A horse-training gallop is located approximately 90 m from proposed Turbine T7. These landowners are participating in the wind farm development and have not raised concerns regarding the proposed location of wind farm infrastructure.

There are no other equestrian businesses in the immediate vicinity of the proposed wind farm. The nearest is Cullahill Equestrian Centre, approximately 2 km northwest of the site, while Nuenna Farm Equestrian Centre is approximately 5 km southeast, near Freshford.

Evolution of the Baseline Environment (the 'Do-Nothing' scenario)

Agricultural usage, primarily grass production is the dominant landuse and will remain so for the foreseeable future, although over time, emphasis on a particular farm enterprise may alter arising from consumer demand or policy changes. There are no current plans for establishing waymarked trails or public parks at the development site. There are no particularly strong equine landuse trends in this part of County Kilkenny

Relevance of Climate Change: Climate change is expected to affect agricultural land in Ireland through changes in temperature, rainfall and growing conditions. These changes may make it more difficult to manage crops and grassland and could affect agricultural productivity and food production.

Reducing greenhouse gas emissions and increasing the ability of forests, vegetation and soils to store carbon are important measures in addressing climate change.

NTS of EIAR Section 6.4 Impact of the Proposed Development

There are **No Moderate or Significant impacts on Land** likely to occur to Agricultural Land, Public Amenity Land or Equestrian Land, arising from the construction, operation or decommissioning of the Whole Gathabawn Windfarm Project,

Impacts to the sensitive aspects of Land which were evaluated.

A. Evaluation of the Effects on Agricultural Land

Degradation or loss of farm water supply – Slight Impact: Construction of the wind farm is unlikely to affect wells used to provide drinking water for livestock. Measures will be put in place to prevent soil, fuel, oil, concrete and other construction materials from entering water supplies. There is a small possibility that construction of a new site road, turbine foundation or hardstand could interrupt the source of a spring within the wind farm site. If this happens, the affected livestock water supply could be temporarily lost until an alternative supply is provided. Wells and springs on neighbouring farms are located sufficiently far from the proposed turbines and construction areas that impacts on livestock water supplies outside the wind farm site, are considered unlikely.

Reduction in Land Area available for Agricultural Use – Neutral Impact During construction, 59 hectares of agricultural lands will be fenced off to accommodate the construction works, this area will reduce to 17 hectares during the operational phase, affecting 24 agricultural landholdings. The loss of agricultural land is very small in scale, in the context of the abundance of agricultural lands in the surrounding area.

Reduction or loss of productivity due to degradation of soils - Neutral Impact. The potential for reductions or loss of compaction, erosion or weathering of soils will be limited to 58 hectares of agricultural lands which occur within the construction works area. When the financial payments to landowners are taken into account, along with the reinstatement of lands following the completion of construction, the impact will be neutral.

Loss of connectivity of landholdings – Neutral Impact. There is alternative access available on many landholdings and crossing points and access gates along both the construction area boundary fence lines and the operational phase boundary fence lines, will be provided.

Effects on animal health and wellbeing due to increases in airborne dust and deposition of dust on grasslands - Imperceptible impact. During dry and windy weather, construction activities and traffic can create dust, with the greatest effects generally occurring within about 50 metres of the source. Most of the land within 50 metres of the main dust-producing activities, such as excavation, earth moving and backfilling, is owned by landowners involved in the development. At the Ballylehaun Area, only one 3rd party agricultural landholding is located within 50 metres, with just two within 250 metres. This means that very few farms or animals are likely to be exposed to construction dust. High levels of dust over long periods can affect the health and wellbeing of livestock and other animals. However, significant effects from construction of the wind farm are considered unlikely. This is because higher dust levels would generally require prolonged dry and windy conditions, construction activities will be temporary, and only a small number of livestock, animals and agricultural landholdings could potentially be affected.

Reduced growth rates due to a change in the drainage regime - Neutral impact. The site drainage network which will be installed at the windfarm site during the construction phase will retain the existing drainage patterns.

Increased farm management costs due to the spread of invasive species - Unlikely impact. No high-impact invasive species were recorded at the Ballylehaun Area or along the Candidate Gathabawn Grid Connection. Japanese Knotweed was identified at one location in the Ballyring Area. Given the active management of agricultural land and landowners' obligations to control invasive species, the establishment of new infestations is considered unlikely.

B. Mitigation Measures

Measures to further minimise the impact on agricultural land use include the implementation of Environmental Management, Waste Management and Health & Safety Management Plans, appropriate design of the site drainage system and control of excavations, movement of machinery and vehicles and controls and procedures for the safe handling and storage of fuels and oils.

NTS of EIAR Section 6.5 Cumulative Impact of the Whole Project

There are no Other Projects within the study areas for Land. the study areas are

- within the landholdings themselves and
- within 6-times the tip height of the turbines for equestrian lands

NTS of EIAR Section 6.6 Summary Conclusion

Agricultural Land: Agriculture is the main land use across the wind farm site, with all turbines located on agricultural land, mainly used for livestock grazing. As effects are expected to be Neutral to Imperceptible/Not Significant, the overall impact on agricultural land will be **Not Significant**.

Other Land Uses: The nearest third-party equestrian lands are approximately 2.5 km from the nearest turbine, well beyond recommended separation distances. There are no official walking trails, public parks or Coillte recreational areas within the site.

Overall, impacts on equestrian lands and public amenity will be **Not Significant**.

NTS of EIAR Chapter 7 Soils

The study in Chapter 7: Soils relates to the land coverage and use, topsoil and subsoil along with the underlying bedrock, associated geological heritage and supported ecological habitats.

The evaluation of Soils was carried out by hydrogeology team members Silas Rowe (BSc (Earth Sciences) Graduate Hydrogeologist; Jack Crawley (BSc, MSc (Hydrogeology and Water Management) associate hydrogeologist; and Stephen Muggeridge (BSc, MSc (Hydrogeology) Technical Director (Hydrogeology) of the **SLR environmental and engineering consultancy**.

Consultation, desktop studies and fieldwork were carried out to gather information. A desk study was completed, which involved collecting relevant information for the proposed development site and the surrounding area. Fieldwork consisted of walkover surveys, geological mapping and baseline monitoring of the site.

- A Borehole survey was carried out at the Ballylehaun Section in 2021
- Trial pit investigations were carried out in August 2021, March 2023 and August 2026 across the site – 30 trial pits were completed in total.
- Geotechnical assessment of the windfarm site in September 2026, including slope stability assessment by Fehily Timoney and Company.

The evaluations for Soils have been carried out in accordance with the Institute of Geologists Ireland 2013 *Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements*, The Department of Heritage and Local Government and the Office of Public Works (2009) *The Planning System and Flood Risk Management Guidelines for Planning Authorities* and the National Roads Authority 2009 *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*, and in accordance with *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

Figures of interest in the EIAR Report

- Figure 7.4a Subsoils
- Figure 7.5a Bedrock Geology

See also Appendix

- Appendix 7 A3 Geotechnical Assessment Report

Figures and Appendices are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 7.2 Sensitive Aspects of Soils

The site mainly consists of topsoil over shallow glacial deposits or bedrock. The underlying rock is primarily siltstone, sandstone and limestone. No peat deposits are present at the site. The soils are not in designated areas (for example, Special Areas of Conservation). There is one County Geological Heritage Sites within the study area - Lisdowney Quarry.

The effects on the following sensitive aspects of Soils were studied:

- Local Soils, Subsoils & Bedrock;
- Soils, Subsoils & Bedrock in Designated Sites;
- Soils, Subsoils & Bedrock in Geological Heritage Sites

The **study area** for all the Sensitive Aspects is within 5km of the Ballylehaun Area Red Line Boundary, within 2km of the Ballyring Area and all other aspects of the proposed windfarm and the route of the candidate grid connection.

NTS of EIAR Section 7.3 Baseline Environment

A. Local Soils, Subsoils and Bedrock

The soils at the site are predominantly loamy drift soils.

The Ballylehaun area is mainly underlain by limestone-based soils and shallow limestone bedrock, with rock at or close to the surface beneath several turbines. The Ballyring area mainly consists of soils derived from sandstone and shale, with shallow bedrock generally encountered about 0.7–0.9 m below ground. Site investigations broadly confirm the mapped soil and geological conditions across both areas.

Subsoils underlying the likely grid connection underground cable comprise, from west to east, shales and sandstone till, bedrock at surface, limestone till, limestone sands and gravel, and river alluvium. The Parksgrove Substation and the existing Ballyragget Substation are also underlain by limestone sands and gravel.

No peat deposits were encountered in the site during the site visits or in the course of the ground investigations.

The wind farm site is underlain by a mixture of limestone, siltstone and sandstone bedrock. Limestone predominates in the Ballylehaun area, while sandstone and siltstone predominate in the Ballyring area.

B. Soils, Subsoils and Bedrock in Designated Sites

The Proposed Gathabawn Windfarm site is located adjacent to the Cullahill Mountain SAC and Cullahill Mountain pNHA. The Spahill and Clomantagh Hill SAC and Spahill and Clomantagh Hill pNHA are located c.860m from the site boundary at the Ballylehaun Section. These are of interest for their semi-natural dry grasslands and scrubland facies on calcareous substrates.

C. Soils, Subsoils and Bedrock in Geological Heritage Sites

A review of the GSI digital map indicates that only one County Geological Heritage Site lies within the study area at the very eastern edge, this is Lisdowney Quarry. This is of interesting for its high diversity of Lower Carboniferous crinoid fauna, particularly, a number of blastoid species. This is a very small quarry that only partly lies within the study area.

NTS of EIAR Section 7.4 Impact of the Proposed Development

The following effects are evaluated in detail to determine whether or not they are likely to be Significant.

A. Local Soils, Subsoils & Bedrock Impacts

Excavation & Relocation of Soils, Subsoils & Bedrock during construction – Slight Impact: Due to the volumes of soil removed and the localised nature of effects, with no part of the windfarm within designated sites, ecological features or geological heritage sites. Mitigation measures will be implemented.

Contamination by Oils, Fuels & Cementitious Materials during construction – Imperceptible Impact: Only relatively small volumes of fuels / oils will be on-site at any one time and therefore no significant spills/leakages are expected. Therefore, any incidents that do occur will largely be limited to small, isolated, low volume spills / leaks that may occur along the development site construction works areas. Several procedures relating to refuelling, accident/spill response and the storage of contaminative liquids will be implemented as part of the mitigation and monitoring measures. Considerable volumes of cement-based compounds will be used at turbine locations, however potential impacts are localised at 15 no. discrete and spread-out locations (i.e. 12 turbine foundations, 2 windfarm control buildings and met mast). In addition, these locations are spread over a large geographical area. Any increase in soil pH will be temporary and reversible. Mitigation measures will be implemented.

Impact on Karst Features in the bedrock limestone from construction works – Imperceptible Impact: The Ballylehaun area is mainly underlain by limestone, including five of the seven turbine locations. Ground investigations confirmed strong limestone at or close to, the surface. Evidence of a possible karst feature was found in only one borehole, at approximately 17 m below ground, and this was infilled with clay. The nearest known karst features are approximately 2.3 km away. Before construction, further investigations will be undertaken and a Karst Risk Management Plan implemented to identify and manage any karst features or significant bedrock fracturing encountered. Mitigation measures will be implemented.

B. Mitigation Measures

Mitigation Measures will be implemented to protect soil. Measures to minimise the impact on local soils, subsoils and bedrock include excavating materials in accordance with best practices for the management and treatment of such materials; reusing excavated materials at the site in an environmentally appropriate and safe manner; restricting the movement of machinery and vehicles to the hardcore surfaces; and implementing fuel/oil and concrete control measures. The full text of the measures can be found in the Soils topic Chapter 7 of the EIA Report.

C. Impacts that will not be significant

All of the remaining potential effects of the proposed Gathabawn Windfarm project on Soils were evaluated and were assessed as having no likelihood of causing significant adverse effects – these include

- Soil degradation due to erosion or weathering;
- Ground instability in soils and subsoils;
- Soil degradation due to compaction;
- Contamination of soil due to backfilling material;
- Reduction in soil quantity and soil degradation due to sealing;
- Soil degradation due to excavation, relocation, erosion or compaction of soils and subsoils, or due to contamination by hydrocarbons;
- Impacts on soils, subsoils and bedrock in Designated Sites and Geological Heritage Sites.

NTS of EIAR Section 7.5 Cumulative Impact with Other Projects

Cumulative developments within the distance of 5km from the Ballylehaun Area and 2km from the Ballyring Area and Candidate Gathabawn Grid Connection have been considered.

Sites relevant to Gathabawn Windfarm are Lisdowney Windfarm(operational); Killeshulán Windfarm and Grid Connection (potential); Littleton Windfarm Grid Connection (in planning).

Sites relevant to the likely grid connection to Ballyragget Substation are Ballynalacken Windfarm Grid Connection (consented); Briskalagh Windfarm Grid Connection (consented); Seskin Windfarm

[Laois/Kilkenny] Grid Connection (under appeal, ACP); Battery Energy Storage System (BESS) 1 at Moatpark (consented); BESS 2 at Moatpark (consented); Littleton WF Grid Connection (in planning); Killoshulan WF Grid Connection (potential).

The Proposed Gathabawn Windfarm and Candidate Gathabawn Grid Connection **will not result in significant cumulative impacts on Soils** with any of the Other Projects within the Cumulative Study Area – the cumulative effects with the Other Project will be no greater than Neutral.

NTS of EIAR Section 7.6 Summary Conclusion

Overall, it is evaluated that the impact of the whole Gathabawn Windfarm project on Soils, both alone and in-combination with with Other Projects, will be Imperceptible and therefore Not Significant.

NTS of EIAR Chapter 8 Water

The study in Chapter 8: Water relates to hydrology and hydrogeology in the area of the proposed Gathabawn Windfarm site. Hydrology is the term used for surface water drainage within regional and local catchments. Hydrogeology is the distribution and flow of groundwater in local groundwater bodies.

The study on Water was prepared by the hydrology and hydrogeology team members of the **SLR Environmental Consulting**. The team members were Silas Rowe, Graduate Hydrogeologist; Michelle Sherry, Hydrogeologist; Katherine Van Story, Water Scientist & EIA Practitioner; Kelly Wyness, Technical Director and Peter Glanville, Technical and Project Director.

Consultation was carried out with Uisce Eireann, Inland Fisheries Ireland, Geological Survey of Ireland and the Office of Public Works. A desk study was completed, which involved collecting all relevant geological, hydrological and hydrogeological information for the proposed development and the surrounding area. Fieldwork included

- Site walkover undertaken by SLR to identify any constraints related to the water environment (August 2025)
- Biological and physiochemical surface water quality monitoring in downstream watercourses
- Borehole survey at the Ballylehaun Section in 2021
- Trial pit investigations in August 2021, March 2023, August 2026 across the Site - 30 trial pits.

The evaluation for Water has been carried out in accordance with industry and best practice guidance, including *Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements* (IGI 2013); *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009), *The Planning System and Flood Risk Management Guidelines for Planning Authorities* (DHLG and OPW 2009) along with the EPA 2022 document *Guidelines on the information to be contained in Environmental Impact Reports*.

See also Appendix

- Appendix 8.2 Surface Water Quality Monitoring Results
- Appendix 8.3 Water Framework Directive Assessment
- Appendix 8.4 Flood Risk Assessment

Figures and Appendices are also available on the dedicated planning website
www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 8.2 Sensitive Aspects of Water

The effects on the following sensitive aspects of Water were studied:

- River Waterbodies
- Groundwater Bodies
- Designated Sites
- Water Supply – groundwater and surface water abstractions

The study area for all the Sensitive Aspects is within 5km of the Ballylehaun Area Red Line Boundary, within 2km of the Ballyring Area and all other aspects of the proposed windfarm and within the construction works boundary of the candidate grid connection.

NTS of EIAR Section 8.3 Baseline Environment

River Waterbodies: Gathabawn Windfarm is located within the Nore catchment. The windfarm is located within two sub catchments - the Ballylehaun Area lies within the Goul sub catchment and the Ballyring Area and the temporary turbine delivery works, lie within the Nore sub catchment. There are several streams within the turbine areas – the Coolnacrutta; Gorteenahilla and its tributary Gorteennamuck; Ballyring Upper and Foyle South streams. There are no proposed water crossings within the Ballylehaun and Ballyring turbine areas. The likely grid connection route and the proposed Substation in Parksgrove are within the Nore catchment also.

The existing water quality of the River Nore Sub-Catchment is rated Moderate.

Groundwater Bodies: The Durrow Groundwater Body (GWB) and the Lisdowney GWB underlies turbines in the Ballylehaun Area. The Lisdowney GWB also underlies all turbines within the Ballyring Area.

Designated Sites: within the study area are

- Cullahill Mountain SAC/pNHA, located along northern border of Ballylehaun Area construction works
- Spahill and Clomantagh Hill SAC/pNHA, c. 1.3 km southwest of T6
- Galmoy Fen SAC/pNHA, c. 4.6 km west of T2.

Other designated sites;

- River Barrow and River Nore SAC
- River Nore SPA
- Inchbeg pNHA, and
- Gales Hill Nature Reserve.

Water Supply: The windfarm site is not located within the groundwater catchment of any mapped Public Water Supply or National Federation of Group Water Schemes registered groundwater source. There are no Uisce Eireann or Group Water Scheme groundwater abstraction points within the study area. There are three Uisce Eireann abstraction points in the vicinity of Freshford town, however they are more than 5 km from the Gathabawn Windfarm Site.

The Geological Survey of Ireland (GSI) has a database of recorded groundwater wells for County Kilkenny. However, the Well Database is not a comprehensive record of all private wells in the County as it is not updated and is a number of years out of date now. For example, the GSI Well Database does not include newer developments with groundwater wells and supplies. Therefore, a conservative approach was adopted here for the baseline and it is assumed that all private dwelling in the vicinity of the proposed development site has a well water supply associated with it, regardless of the presence of public water pipes along the adjacent public roads, or not.

Flooding: A Site-Specific Flood Risk Assessment has been prepared for the Proposed Development. The assessment concludes that the windfarm site and the grid connection sites are not at risk of fluvial, pluvial or groundwater flooding.

NTS of EIAR Section 8.4 Impact of the Proposed Development

The following effects are evaluated in detail to determine whether or not they are likely to be Significant.

A. River Waterbodies

Reduction in surface water quality from sediment release: Construction Phase: Earthworks and soil excavation could result in sediment entering nearby surface waters. There is no direct hydrological connection to the Coolnacrutta or River Goul. At the turbine delivery facilitating works, Foyle South stream is approximately 90m from FW8, Gorteenahilla approximately 23m from FW8, and Ballyring Upper approximately 5m from FW9. As these works will be small-scale and temporary, the unmitigated effect is considered Not Significant.

Operational Phase: Maintenance of site roads and drainage could occasionally result in sediment entering surface waters. Without mitigation, the effect is considered Slight to Not Significant.

Mitigation measures will be implemented as best practice environmental management. The impact after mitigation is not significant.

Reduction in Surface Water Quality from accidental spillage of fuels and cement products

Construction Phase: Accidental spills or leaks of fuel, oil, chemicals or cement during construction could affect nearby surface water and groundwater. Most works are separated from local streams and rivers and no works will take place within watercourses. Turbine delivery facilitating works FW9 will be approximately 5m from the Ballyring Upper stream. Due to the short duration of these works, the worst-case unmitigated effect on water quality is considered temporary to short-term, negative and moderate. The potential worst-case impact of the Candidate Gathabawn Grid Connection will be negative, temporary to short term, slight significance to not significant.

Operational Phase: The risk of fuel or oil spills will be limited mainly to turbine and Control Building maintenance. Only small quantities will be present on-site, and oil-containing equipment will be appropriately contained. The potential effect on water quality is therefore considered imperceptible. The impact of the grid connection will also be imperceptible.

Even though significant impacts are not predicted, the mitigation and monitoring measures will be implemented as best practice environmental measures. The impact after mitigation is imperceptible.

B. Groundwater Bodies

Reduction in Groundwater Quality due to sedimentation, contamination by hydrocarbons and /or cement-based compounds: Construction Phase - Construction could allow pollutants such as sediment, fuel or cement to enter groundwater where bedrock is exposed. The risk is greater at Ballylehaun, where limestone bedrock is shallow and karstic, than at Ballyring, where siltstone bedrock generally has greater soil cover. Overall, the potential effect on groundwater quality is considered temporary, unlikely and Slight.

Operational Phase: No new excavation into bedrock is expected during operation, with groundworks mainly limited to maintenance of site roads and drainage. The potential effect on groundwater quality is therefore not significant.

The grid connection impacts are considered not significant.

Even though significant impacts are not predicted, the mitigation and monitoring measures will be implemented as best practice environmental measures. The impact after mitigation is not significant.

C. Designated Sites

Reduction in Water Quality or Quantity in Designated Sites: Construction Phase The Cullahill Mountain SAC and pNHA and Gales Hill Nature Reserve are generally upslope of the Ballylehaun works, with surface and groundwater flowing away from these areas. Site drainage will also prevent dirty construction runoff reaching them. The potential effect is therefore not significant. The wind farm has an indirect water connection to the River Barrow and River Nore SAC, River Nore SPA and Inchbeg pNHA, with the closest connection approximately 7.4–7.5km away. Given these distances and the opportunity for sediment or pollutants to reduce before reaching the designated sites, effects are considered slight to not significant.

Operational Phase: With groundworks limited mainly to road and drainage maintenance, effects on designated sites during operation are considered Imperceptible.

The grid connection impacts are considered not significant.

Even though significant impacts are not predicted, the mitigation and monitoring measures will be implemented as best practice environmental measures. The impact after mitigation is imperceptible.

D. Mitigation Measures

Mitigation measures which form part of standard windfarm construction/operation will be implemented during the construction/operation/decommissioning of the development to protect the Water environment and avoid/reduce these not significant effects. Measures to minimise any potential adverse impact on the water environment include:

- fuel, oil and concrete control procedures
- surface water quality monitoring
- the installation of the Site drainage network with regular inspections to ensure effectiveness
- the provision of secure bunding for fuels and oils at the temporary construction compound; and
- the appointment of a site Environmental Manager with a 'stop-works' authority should a significant unforeseen environmental effect take place.

E. Impacts that will not be significant

All of the remaining potential effects of the proposed Gathabawn Windfarm project on Water were evaluated and were assessed as having no likelihood of causing significant adverse effects – these include

- Increase in risk of flooding due to increase in surface water run-off and sediment release
- Changes to surface water quantities due to increased runoff rates and/or changes to drainage patterns
- Hydro-morphological effects due to watercourse crossing works
- Reduction in Surface Water Quality during the Operational Phase
- Reduction in groundwater levels from dewatering of turbine base excavations
- Reduction in groundwater quality due to contamination by hydrocarbons
- Alteration of groundwater levels and/or flow paths
- Reduction in groundwater quality at Water Supply Schemes from sediment release / accidental spillage
- Reduction in water quality at the Uisce Éireann abstraction point at Freshford
- Reduction in groundwater quality at local domestic water supplies from sediment release /accidental spillage
- Reductions in surface water quality at local groundwater wells
- Potential flow regime effects to Designated Sites
- Changes to drainage regimes and water quantities in all downstream Designated Sites

Based on the assessment of potential impacts undertaken, it is considered that with mitigation measures, there are no significant adverse impacts on the surface water and groundwater receiving environment arising out of the proposed Gathabawn Windfarm and the likely Grid Connection.

NTS of EIAR Section 8.5 Cumulative Effect with Other Projects

For the assessment of cumulative effects, any other permitted or proposed and unbuilt projects in proximity to the Site (energy or other) have been considered where they have the potential to generate an in-combination or cumulative impact with the Whole Gathabawn Windfarm Project. The cumulative projects considered were

- Lisdowney Windfarm (operational); Ballynalacken Windfarm (consented); Seskin Windfarm and Grid Connection [Laois/Kilkenny] (under appeal, ACP); Killoshulan Windfarm and Grid Connection (potential).
- Projects in the Parksgrove/Moatpark Area: BESS1 & 2, Moatpark (consented); EirGrid Substation Compound Extension; Ballynalacken WF Grid Connection (consented); Briskalagh WF Grid Connection (consented); Littleton WF Grid Connection (in planning); Killoshulan WF Grid Connection (potential); Tirlán Dairy Processing Facility and Water Treatment Plant (operational)
- Developments in the Wider Regional Area: Coolglass WindFarm (consented); Garrylaun Mining Project (consented); Kilderry Solar Farm (consented); Clara Energy Storage Project (consented); Large Housing Developments in the environs of Kilkenny City.

Considering the nature of the surface water and groundwater receiving environment and geographical factors, with mitigation measures for the proposed development and other identified developments, it is considered that there will be no cumulative effects associated with the construction, operation or decommissioning phases of the Proposed Gathabawn Windfarm Project when considered cumulatively and in combination with the other identified developments assessed here.

NTS of EIAR Section 8.6 Water Summary Conclusion

Surface Water: The Gathabawn Windfarm lies within the **River Nore catchment**, with several local streams and agricultural drains present. No new watercourse crossings are required within the Ballylehaun or Ballyring infrastructure areas, although existing crossings occur along the grid connection underground cable routes. Construction could affect water quality through sediment, fuel or cement entering runoff. A Drainage Management Plan and pollution prevention measures will control runoff, with no direct discharge to local watercourses or existing drains. With these measures in place, effects on surface water are expected to be **Not Significant**.

Groundwater: The Ballylehaun Area lies within the **Durrow Groundwater Body**, a regionally important karst limestone aquifer, while the Ballyring Area and Turbines T6 and T7 lie within the less productive **Lisdowney Groundwater Body**. Part of the grid connection also crosses the **Kilkenny–Ballynakill Gravels Groundwater Body**. No karst features have been identified within the wind farm site. Potential risks to groundwater, mainly from fuel or oil spills and limited localised dewatering during construction, will be controlled through mitigation measures. Overall, effects on groundwater quality and quantity are expected to be **Not Significant**.

Water Supplies: The wind farm site is not located within a mapped Public Water Supply or registered Group Water Scheme groundwater source. However, private wells are expected to serve nearby homes and farms and have been conservatively assumed for the assessment. Construction could potentially affect local water supplies, but pollution prevention measures will be implemented. With mitigation in place, effects on water supplies are expected to be **Not Significant**.

Designated and Protected Sites: Protected sites near the wind farm include Cullahill Mountain SAC/pNHA, Spahill and Clomantagh Hill SAC/pNHA, Galmoy Fen SAC/pNHA, River Barrow and River Nore SAC, River Nore SPA, Inchbeg pNHA, and Gales Hill Nature Reserve. Site drainage and groundwater conditions mean impacts

on these areas are unlikely. With mitigation measures in place, effects on designated and protected sites are expected to be Not Significant.

NTS of EIAR Chapter 9 Air Quality

Chapter 9: Air Quality in particular relates to levels of dust and pollutants in the air.

Ciara Nolan of **AWN Consulting**, a multidisciplinary environmental consultancy, evaluated Air Quality.

Consultation, desktop studies and fieldwork were carried out to gather information. A desk study was completed which included a review of aerial photography, and online mapping to identify local residential properties and any local community facilities, schools, hospitals, amenity areas or workplaces, in close proximity to the proposed development.

The evaluation for air quality and dust impacts have been carried out in accordance with EU Directive 2024/2881, the Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (2024), and the Transport Infrastructure Ireland guidance document *Air Quality Assessment of Specified Infrastructure Projects - Overarching Technical Document PE-ENV-01106* (2025).

Figures of interest in the EIAR Report

- Figure 9.1 Construction Dust Human Receptors

Figures are also available on the dedicated planning website www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 9.2 Sensitive Aspects of Air Quality

A. Impact Sources from the proposed development

Construction activities, including earthworks and vehicle movements, may generate dust and emissions of pollutants with the potential to affect nearby residential and ecological receptors. Dust levels will vary depending on the construction activity and weather conditions. The proposed Gathabawn Windfarm will not generate odour.

The effects of the proposed development on **Human Receptors and Ecological Receptors/Designated Habitats for dust and vehicle emissions** were studied.

B. Study Areas

The **Study areas** for Human and Ecological Receptors are

- within 250m from the boundary of the site, and within 50m of routes used by construction vehicles for the first 250m from the site exit.
- Selected representative sensitive receptors, located within 200m of the affected road network are also studied for Human Receptors
- All sensitive, designated habitats, located within 200m of the affected road network are also studied for Ecological Receptors

NTS of EIAR Section 9.3 Baseline Environment

Human Receptors: The Proposed Gathabawn Windfarm and Candidate Gathabawn Grid Connection are located in a predominantly rural open countryside area away from major urban areas and centres of population. The air quality in this upland area is considered good as it is located away from busy, congested

roads and industrial sources of air pollutants. There are low numbers of sensitive receptors surrounding the Gathabawn Windfarm site, with just 25 no. high sensitivity residence within 250m of a construction works area associated with the Gathabawn Windfarm. There are 52 no. receptors within 250m of the Candidate Gathabawn Grid Connection construction works.

Walkers along the Gathabawn Loop Walk or along the local road network at Gathabawn are considered to have low sensitivity to dust or air quality impacts due to the transient nature of this receptor.

Ecological Receptors: There are a number of sensitive ecological receptors within 50m of the construction works area for the proposed development. These include Cullahill Mountain SAC; River Barrow and River Nore SAC; Cullahill Mountain pNHA; River Nore/Abbeyleix Woods Complex pNHA; Veteran trees at Ballylehaun; Gales Hill nature reserve; and Hazel wood refuge for fauna and flora at Ballylehaun.

Evolution of the Baseline Environment (the 'Do-Nothing' scenario)

Particulate matter (PM₁₀ and PM_{2.5}) levels are expected to remain broadly similar to existing conditions. Given the rural nature of the area and low traffic levels, no significant changes are anticipated prior to construction of the proposed wind farm.

NTS of EIAR Section 9.4 Impact of the Proposed Development

The following effects are evaluated in detail to determine whether or not they are likely to be Significant.

A. Human Receptors

Increase in airborne dust from the delivery of construction materials to works areas, excavation and relocation of soils, earthmoving: The surrounding area is considered to have medium sensitivity to dust soiling and low sensitivity to dust-related human health effects. A total of 25 residential properties are located within 250 m of proposed construction works, with no sensitive human receptors within 250 m of turbine foundations, hardstandings or borrow pits. Prior to mitigation, there is a medium risk of dust soiling and a low risk of dust-related human health effects. Mitigation measures will be implemented. The impact after mitigation for the windfarm and the grid connection Imperceptible.

B. Ecological Receptors

Dust soiling from delivery of construction materials to works areas, excavation and relocation of soils, earthmoving: Cullahill Mountain SAC and pNHA, Veteran trees at Ballylehaun, Gales Hill nature reserve and the Hazel wood at Ballylehaun are at risk of dust-related ecological impacts related to the proposed construction works for the windfarm. Cullahill Mountain SAC and pNHA, the River Barrow and River Nore SAC and the River Nore SPA and River Nore/Abbeyleix Woods Complex pNHA are at risk of dust-related ecological impacts related to the proposed construction works for the grid connection. Mitigation measures will be implemented. The impact after mitigation for the windfarm and the grid connection Imperceptible.

C. Human and Ecological Receptors

Indirect improvement in air quality and savings in NO_x emissions because of the production of renewable energy: The windfarm will generate renewable electricity, reducing the need for electricity generated from fossil fuels and associated pollution to air. This will result in a positive effect on air quality over the lifetime of the development.

D. Mitigation Measures

Mitigation Measures will be implemented to protect Air Quality. Key measures to minimise the impact include - During construction, excavation will be minimised and excavated materials will be appropriately managed, stored and reused where possible, including the use of material from on-site borrow pits.

Measures to minimise dust will include monitoring during construction, regular inspection and cleaning of public roads, wheel washing, covering potentially dusty loads and controlling vehicle speeds. Stockpiled materials will also be appropriately managed and reinstated. These measures will minimise dust generation and prevent mud and debris from being carried onto the public road network.

Specific measures will be implemented to minimise dust and protect Cullahill Mountain SAC during construction. These will include establishing a protective barrier to prevent works encroaching towards the SAC, paving sections of the site road, wheel washing and controlling vehicle speeds.

E. Impacts that will not be significant

All of the remaining potential effects of the proposed Gathabawn Windfarm project on Air Quality were evaluated and were assessed as having no likelihood of causing significant adverse effects – these include

- Dust-related health effects to Walkers on local Gathabawn Loop Walk during construction
- Increase in airborne dust during operation/decommissioning
- Dust Soiling at designated sites during operation/decommissioning

NTS of EIAR Section 9.5 Cumulative Impact with Other Projects

There is potential for construction of the proposed development to overlap with other nearby windfarm, grid and energy developments. This could result in cumulative dust and vehicle emissions during construction. However, with the proposed dust mitigation measures in place, cumulative effects are predicted to be short-term, localised and not significant.

NTS of EIAR Section 9.6 Summary Conclusion

To conclude, it is evaluated that adverse impacts to Air of the Gathabawn Windfarm, both alone and cumulatively with Other Projects will be no greater than Imperceptible therefore Not Significant.

There will also be an indirect positive impact to air quality as a result of the generation of renewable electricity which can replace fossil fuel generated electricity (and the associated air emissions).

NTS of EIAR Chapter 10 Noise & Vibration

Chapter 10: Noise and Vibration is an assessment of the potential noise and vibration impact on local residential amenity, from the proposed Gathabawn Windfarm development.

The Noise and vibration evaluation has been prepared by Mike Simms (Principal Acoustic Consultant) and Miguel Cartuyvels (Acoustic Consultant) of **AWN Consulting Ltd.**

Desktop studies included reviewing aerial images of the study area; Review of Kilkenny County Council Planning Files for new houses permitted in the Study Area; Peer-reviewed studies on noise and vibration and review of Lisdowney Windfarm planning conditions. Fieldwork comprised background noise measurements and site visits.

Figures of interest in the EIAR Report

- Figure 10.2 Noise Sensitive Locations
- Figure 10.4 Noise Prediction Model Results (Noise Contour Map)

See also Appendix

- Appendix 10.4 background Noise Survey

Figures and Appendices are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

The noise and vibration assessment was undertaken in accordance with relevant EPA guidance and recognised Irish, UK and international standards for construction, road traffic and wind turbine noise. These include the Wind Energy Development Guidelines, ETSU-R-97 and update Assessment and Rating of Wind Turbine Noise (2026) ARWTN, the Institute of Acoustics (IOA) Good Practice Guide, TII guidance and ISO 9613 standards.

NTS of EIAR Section 10.2 Sensitive Aspects Noise & Vibration

The effects on the following sensitive aspects of Noise & Vibration were studied: **Residents or People at Noise Sensitive Locations.**

The **study areas** for Residents or People at Noise Sensitive Locations are

- 2km around the main construction works which will occur at the windfarm site – Construction Noise
- Along the local roads subject to concentrated material haulage – Construction Noise
- 2km from the proposed Gathabawn turbines – Operational Noise
- Existing Lisdowney Windfarm – closest turbine 1.25km to the north (Cumulative Operational Noise)

NTS of EIAR Section 10.3 Baseline Environment

In general terms the proposed development is located in a predominantly rural area and away from major urban areas or centres of population. The surrounding landscape comprises agricultural grassland and to a

lesser extent, commercial forestry plantations. The existing noise sources comprise natural and man-made noise sources. Natural noise sources include mainly wind-borne noise and birdsong. Man-made noise sources include farm machinery and milking parlours when in operation, and traffic on the local road network. The existing Lisdowney Windfarm also contributes to the existing ambient noise environment. There are few sources of vibration in the local environment.

There are 263 No. **noise-sensitive locations (NSLs)** within the noise study area of the proposed turbines. Distance ranges are summarised below:

- 65 No. NSLs are within 1km of a proposed turbine
- 104 No. NSLs between 1km and 1.5km of a proposed turbine
- 105 No. NSLs between 1.5km and 2km of a proposed turbine

There are no community facilities within the study area, i.e. within 2km of the Gathabawn turbines.

Areas of High Amenity include the following: Gathabawn Loop Walk; Millenium Park; and Spa Hill viewing.

Baseline noise levels have been measured at eight representative NSLs surrounding the proposed development site.

NTS of EIAR Section 10.4 Impact of the Proposed Development

The following noise impacts are evaluated in detail

- Operational noise from the Proposed Gathabawn Turbines
- Consideration of Low Frequency Sound, Tonality & Amplitude Modulation Vibration from construction works

A. Operational noise from the Proposed Gathabawn Turbines

Assessment of Operating Wind Turbine Noise – Gathabawn Standalone Results

Noise from the Proposed Gathabawn Windfarm was predicted at all 274 nearby noise-sensitive locations, using conservative assumptions representing worst-case conditions. Predicted noise levels comply with the applicable criteria at all locations except two locations (H055 and H056) during daytime periods. No exceedances are predicted during the night.

A noise curtailment strategy will therefore be implemented. Noise surveys will be undertaken before construction and following commissioning. Where an exceedance is confirmed, specified turbines will operate in reduced-noise modes under the relevant wind conditions.

Further monitoring will confirm that the measures are effective and that the required operational noise limits are achieved.

B. Consideration of Low Frequency Sound, Tonality & Amplitude Modulation Vibration from construction works

Special Characteristics - Low frequency noise and infrasound do not require specific assessment as they are generally below the threshold of perception at typical receptor distances and are not expected to result in any significant effect at the NSLs. Consequently, no assessment criteria for low-frequency noise or infrasound have been adopted as part of this EIAR.

A notable update within the new industry standard Assessment and Rating of Wind Turbine Noise (2026) ARWTN, is the confirmation that certain acoustical issues do not require specific assessment during the

planning process: namely infrasound, ground-borne vibration and low-frequency noise. The guidance confirms that infrasound generated by modern wind turbines is below the threshold of perception at typical receptor distances, that ground-borne vibration levels are significantly below those detectable by humans, and that low-frequency noise is adequately controlled through the standard A-weighted noise assessment criteria and tonal assessment procedures. Consequently, assessment of these characteristics is scoped out of the operational noise assessment for the Proposed Project.

Special Characteristics – Tonality: Modern wind turbines are designed to minimise tonal noise, such as noticeable humming or whining, and its occurrence is considered unlikely. If a complaint indicates clearly audible tonal noise, an independent acoustic consultant will investigate. Where persistent tonality is confirmed, appropriate engineering or turbine operational measures will be implemented to minimise the effect.

Special Characteristics – Amplitude Modulation (AM) describes the regular rise and fall in the level of wind turbine noise as the blades rotate. Two types are recognised: Normal AM and Other AM (OAM).

Normal AM is the familiar “swishing” sound produced as the turbine blades rotate. It is a normal characteristic of wind turbine noise and generally becomes less noticeable as distance from the turbine increases.

Other AM (OAM) is different and may be heard as a more noticeable “whoomphing” sound. It can occur when wind and weather conditions change the way air flows around the turbine blades and, where it occurs, can sometimes be heard at greater distances. Its occurrence can depend on factors such as wind speed and direction and may persist for a period under particular conditions.

Research indicates that OAM is uncommon and generally intermittent. A UK study of 133 operational wind farms identified OAM as an issue at four sites and a possible issue at a further eight. Even at sites where OAM has occurred, it has generally only been present for limited periods.

There is currently no reliable method of predicting at the planning stage whether OAM will occur at a particular windfarm. It can occur during operation, but available research indicates that it is the exception rather than a normal feature of wind turbine noise.

Amplitude Modulation Guidance: Normal AM is an inherent feature of wind turbine noise and is accounted for in standard noise limits.

Other AM (OAM) can be more noticeable but cannot reliably be predicted at the planning stage.

The IOA 2016 Reference Method, Assessment and Rating of Wind Turbine Noise (2026) and IEC 61400-11-2:2024 provide recognised methods for measuring and rating AM during operation. As Other AM is unpredictable, assessment is generally complaint-led. If a complaint indicates potential excessive Other AM at the Proposed Gathabawn Windfarm, operational monitoring will be undertaken using recognised methods and appropriate turbine controls implemented where required.

EIA Report Mitigation Measure OMM06 (Amplitude Modulation Mitigation): Amplitude Modulation – Complaint-Led Monitoring. If a complaint indicates potential excessive Other AM, an independent acoustic consultant will investigate the conditions under which it occurs. Where mitigation is required, the relevant wind and turbine operating conditions can be programmed into the windfarm’s SCADA control system. When SCADA detects those defined conditions, it can automatically change the operating mode or curtail the relevant turbine(s) to minimise AM.

C. Operational Noise Mitigation

Noise modelling predicts that the Proposed Gathabawn Windfarm will comply with operational noise criteria at all noise-sensitive locations. Operational controls are required at two houses.

Pre-construction and post-commissioning noise surveys will verify compliance at all houses. If an exceedance is identified, the SCADA system will activate reduced-noise operating modes for specified turbines under the relevant wind conditions.

Further monitoring will confirm the effectiveness of the mitigation.

D. Impacts that are not likely to be significant

All of the remaining Noise or Vibration effects of the Gathabawn Windfarm Project have no likelihood of causing significant adverse effects to local residents or local community receptors. These are listed below

- **Construction Stage Noise & Vibration Impacts:** Construction noise will be temporary and variable. Worst-case effects at the nearest noise-sensitive locations are assessed as Negative, Not Significant and Short-Term.
- **Construction Traffic Noise:** Construction traffic will temporarily increase noise on some local roads. The assessment used conservative assumptions, including treating all construction vehicles as HGVs. Although noticeable increases may occur on the L-1806, L-1807 and L-5818, predicted noise levels remain below the 65 dB construction noise threshold. Construction traffic noise effects are therefore assessed as Not Significant.
- **Construction Vibration** has been assessed against recognised criteria for human comfort and the protection of buildings from cosmetic or structural damage. Vibration levels are expected to remain within the relevant limits, resulting in an Imperceptible effect. Blasting and piling are not expected to be required; however, if limited works are necessary, separation from sensitive locations means significant effects are not anticipated.
- **Vibration from Borrow Pits:** The nearest noise-sensitive location is approximately 438 m from the borrow pits. Given this separation and the temporary nature of the works, significant vibration effects are not expected. Effects are assessed as Neutral, Imperceptible and Short-Term.
- **Operational Control Building Noise:** The Ballylehaun and Ballyring Control Buildings will not contain significant sources of noise or vibration. Effects at the nearest noise-sensitive locations are therefore assessed as Neutral, Imperceptible and Long-Term, and Not Significant.
- **Operational Vibration:** Vibration from operational wind turbines will be very low and, as all noise-sensitive locations are more than 300 m from the turbines, is expected to be below perceptible levels and well below levels that could cause building damage or affect human health. Operational vibration effects are therefore assessed as Neutral, Imperceptible and Not Significant.

E. Best Practice Measures for non-significant effects

Best practice measures will be incorporated into the Environmental Management Plan. Construction will generally be limited to 07:00–19:00 Monday to Friday and 08:00–13:00 on Saturdays, particularly for activities generating high noise or vibration. Work outside these hours may occasionally be required for activities such as concrete pours, weather-dependent works or delivery of large turbine components. Other measures include maintaining plant, noise monitoring and providing a Community Liaison Officer to respond to local concerns.

NTS of EIAR Section 10.5 Cumulative Effects with Other Projects

Due to its proximity (1.25km), the Lisdowney Windfarm is the principal project to be considered for cumulative noise emissions.

Cumulative noise levels are predicted to comply with the relevant criteria at all noise-sensitive locations except H055, H056, H063 and H064, where exceedances are identified and further assessment has been undertaken.

Noise modelling assumes all turbines operate normally without restrictions and predicts compliance at 272 of the 274 noise-sensitive locations. A 0.2 dB exceedance at H063 does not require mitigation because the existing Lisdowney WindFarm is the main contributor and curtailing the Proposed Gathabawn Windfarm would produce an imperceptible change in overall noise levels. Slight exceedances at the remaining locations can be addressed, if confirmed by post-commissioning monitoring, through SCADA-controlled reduced-noise operating modes or curtailment under the relevant wind conditions.

NTS of EIAR Section 10.6 Summary Conclusion

Noise and Vibration Effects on Local Residents

Construction: Noise and vibration will be temporary and controlled through best-practice measures and are not expected to exceed recommended limits. Construction effects are therefore Not Significant.

Operation: Turbine noise was modelled at 274 Noise Sensitive Locations (NSLs) across a range of wind speeds. Following mitigation, where required, operational noise will comply with relevant noise limits at all houses within 2km of a proposed turbine. Operational vibration will also be Not Significant.

Overall, noise and vibration effects from the Proposed Gathabawn Windfarm, including cumulative effects, are assessed as Not Significant.

NTS of EIAR Chapter 11 Shadow Flicker

The study in Chapter 11 Shadow Flicker assesses potential shadow flicker effects on residences in the area.

The Shadow Flicker analysis has been carried out by Ms. Kathlyn Feeney, an Environmental Scientist, and reviewed by Ms. Sarah Moore, Environmental Scientist, of **Jennings O'Donovan Consulting Engineers**.

Desktop studies were carried out, which included a review of local residence locations. The evaluation for Shadow Flicker has been carried out in accordance with industry and best practice guidance, including the *Wind Energy Development Guidelines* (Department of the Environment, Heritage and Local Government, 2006), the *Best Practice Guidelines for the Irish Wind Energy Industry* (Irish Wind Energy Association, 2012) and the *Draft Revised Wind Energy Development Guidelines* (Department of Housing, Local Government and Heritage, 2019).

The modelling results are presented as follows:

Worst Case' Daily Shadow Flicker: The expected daily shadow flicker cannot be predicted as this depends on multiple variable factors such as wind direction, wind speed, cloud cover and sunshine, and there is potential for any individual day to be sunny for whole day. Therefore the modelling result present the **worst case for daily shadow flicker occurrence**.

Predicted Annual Shadow Flicker occurrence: As this is the result for the total hours of shadow flicker in a year, the average annual sunshine for the site and average annual wind direction can be input, resulting in a more realistic modelling of shadow flicker occurrence – i.e. the expected shadow flicker values per year which are likely to be experienced by each receptor within the shadow flicker study area.

Figures of interest in the EIAR Report

- Figure 11.1 Sensitive Receptors within 10 rotor diameters of Gathabawn Windfarm

See also Appendix

- Appendix A11-2 Modelling Results Gathabawn WF
- Appendix A11-3 Modelling Results Cumulative

Figures and Appendices are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 11.2 Sensitive Aspects of Shadow Flicker

Wind turbines, like other tall structures, can cast long shadows when the sun is low in the sky. The effect known as 'shadow flicker' occurs where the rotating blades of a wind turbine casts a moving shadow which, if it passes over a window in a nearby house or other property, results in a rapid change or flicker in the incoming sunlight. Shadow flicker lasts only for a short period and happens only in certain specific combined circumstances

- The sun is shining,
- The turbine is directly between the sun and the affected property,

- There is enough wind energy to ensure that the turbine blades are moving, and
- The turbine blades are positioned so as to cast a shadow on the receptor.

If any one of these conditions are absent, shadow flicker cannot occur. The 2019 Draft Revised Wind Energy Development Guidelines also added that:

- “There is sufficient direct sunlight to cause shadows (cloud, mist, fog or air pollution could limit solar energy levels)” and noted that
- “Generally only properties within 130 degrees either side of north, relative to the turbines, can be affected at these latitudes in the UK and Ireland – turbines do not cast long shadows on their southern side”.

Shadow flicker can occur when rotating turbine blades pass between the sun and a nearby property, causing a moving shadow. As the sun moves across the sky during the day, and its path changes with the seasons, the direction and length of turbine shadows also change. Shadows are generally longer when the sun is low in the sky, particularly during winter, with shadow flicker most likely to occur at properties located east or west of the turbines.

The effects on the following sensitive aspects of Shadow Flicker were studied: **Residential Receptors.**

The **study area** includes residential receptors within a distance equivalent in length to 10 of the proposed wind turbine rotor diameters (i.e. 1360m from the nearest proposed turbines) in accordance with best practice.

NTS of EIAR Section 11.3 Baseline Environment

Residential Receptors: There are 134 properties within the shadow flicker Study Area radius, with the closest residence at a distance of 509m from the nearest proposed turbine.

Lisdowney Wind Farm, located 1.2km north of the closest Gathabawn Windfarm turbine location (T9), is considered to be an existing source of shadow flicker in the environment.

Trends in the environment

There has been a trend of renewable energy development in the area, with Lisdowney Windfarm becoming operational in 2016. The addition of further wind energy development will mean additional shadow flicker sources in the area and an increase in shadow flicker levels, albeit within the bounds of the limits as imposed by conditions of planning.

NTS of EIAR Section 11.4 Impact of the Proposed Development

A. Predicted Shadow Flicker Impact at houses within 1360m

The Shadow Flicker evaluation examined the potential for shadow flicker from the proposed Gathabawn Windfarm turbines at all houses within 1360m of the nearest turbine.

The calculated **worst-case shadow flicker occurrences** assumes the sun is always shining, that there is no cloud cover, the blades are rotating and facing the house, that there is a window facing the turbines and not obscured by vegetation/buildings and that the dwelling is occupied. The calculation is based on topography alone and excludes vegetation, buildings and other man-made structures.

The calculated **realistic shadow flicker occurrences** consider average sunshine levels and average wind direction in the modelling. However, no allowance is included for the periods when the blades are not turning

(such as during low wind speeds or during maintenance), nor for any screening provided by trees or buildings which may occur between a house and the turbine(s). Therefore, even the realistic results are an overestimate.

As modelled in the EIA Report it is predicted that 102 out of 134 receptors within 1360m of a turbine will experience some degree of shadow flicker.

With regard to daily shadow flicker occurrence, the 2006 Wind Energy Guidelines (WEG Guidelines) recommend a threshold limit of 30 minutes in a given day. There are 80 sensitive receptors which exceed the WEG Guidelines of a maximum of 30 minutes of shadow flicker, in a given day **in the worst-case scenario** (only worst case scenario can be modelled for occurrences on given days). The closest receptor H38, is 509m from the closest turbine (T7). This receptor exceeds the day limit by 32mins, under the worse-case occurrence scenario modelling. H38 is predicted to experience 19 hours and 57 minutes in the year, in the realistic occurrence scenario, which is under the WEG Guideline limits.

No shadow flicker is predicted to be experienced at the 32 remaining receptors.

With regard to yearly shadow flicker occurrence, the WEG Guidelines recommend a threshold limit of 30 hours per year. None of the receptors are expected to experience the WEG Guidelines limit of 30 hours or more of shadow flicker per year, in a realistic occurrence scenario. The most affected receptor is H9 which is predicted to experience a total annual shadow flicker of 29 hours and 45 minutes, in the realistic scenario.

As the WEG Guideline limits are being exceeded at some houses on a given day, this would be considered significant and require mitigation measures. The mitigation measures to avoid these exceedances is set out below.

However notwithstanding theoretical or realistic modelling scenarios should the development be granted planning permission, there will be planning conditions controlling shadow flicker. These will likely be based on either the current Wind Energy Guidelines (2006) or Draft Revised Wind Energy Guidelines, December 2019, if these guidelines are adopted at the time of the planning decision.

B. Mitigation Measure

Although significant shadow flicker effects are not expected in a realistic scenario, all turbines at Gathabawn Windfarm will be fitted with a shadow flicker control system. The system uses light sensors and information on turbine operation to identify when shadow flicker could occur at nearby homes.

Where necessary, the system will automatically pause the relevant turbine to ensure that shadow flicker remains within permitted limits or eliminated if required. The system will also keep a record of potential shadow flicker events.

If a resident makes a complaint about shadow flicker, it will be investigated. Where required, the control system can be adjusted so that the relevant turbine automatically stops when conditions could cause shadow flicker at that property.

NTS of EIAR Section 11.5 Cumulative Impact with Other Projects

The results of shadow flicker cumulative modelling presents the assessment of worst-case and realistic case scenarios for the cumulative shadow flicker, from Gathabawn Windfarm turbines and Lisdowney Windfarm turbines.

The assessment showed 5 no. receptors (H63, H156, H159, H160 and H161) are predicted to be affected by the operational Lisdowney Windfarm and not the proposed Gathabawn Windfarm.

Out of the 134 sensitive receptors examined for Gathabawn Windfarm alone, two receptors have been identified to have additional periods of Shadow Flicker when modelled cumulatively (Gathabawn and Lisdowney windfarms together). The results are for a given day in minutes

- H150 will increase from 20 mins to 36 mins
- H151 will increase from 17 mins to 38 mins.

These two houses exceed the WEG Guidelines of 30 minutes of shadow flicker on a given day in the cumulative scenario only. No sensitive receptors exceed the 30 hours or more of shadow flicker per year in the **realistic cumulative scenario**.

The mitigation measure of Shadow Flicker Control will avoid these predicted exceedances.

NTS of EIAR Section 11.6 Summary Conclusion

With the implementation of the shadow flicker modules in the turbines, **no exceedances of the threshold levels outlined in the WED Guidelines will occur. In addition**, if a resident makes a complaint about shadow flicker, it will be investigated. Where required, the control system can be adjusted so that the relevant turbine automatically stops when conditions could cause shadow flicker at that property.

The residual effects will be Not Significant/Neutral.

NTS of EIAR Chapter 12 Climate

Chapter 12 of the EIA Report assesses Climate. Climate is defined as the average weather over time. Climate change is a significant change in average weather, which has accelerated because of human activities through the release of greenhouse gases which alter the Earth's atmosphere, resulting in a 'Greenhouse Effect'. This is causing an increase in the atmosphere's heat trapping abilities, resulting in increased average global temperatures (global warming).

The Climate chapter was prepared by Ciara Nolan of **AWN Consulting**, a multidisciplinary environmental consultancy.

Consultation and desktop studies were carried out to gather information. A desk study was completed which involved reviewing appropriate guidance. The evaluation for Climate has been carried out in accordance with industry and best practice guidance, including the Transport Infrastructure Ireland (TII) guidance document PE-ENV-01104 *Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document*, and the TII Carbon Tool. The TII methodology has been used to determine the significance of potential impacts.

The EIA Report chapter includes two appendices

- Appendix 12.1 Methodology for the evaluation of Climate
- Appendix 12.2 Consistency with Section 15 of the Climate Act

Appendices are also available on the dedicated planning website www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 12.2 Sensitive Aspects of Climate

Greenhouse gas emissions, particularly from burning fossil fuels, contribute to climate change by emitting greenhouse gasses which increase global temperatures. Climate change is already resulting in more frequent and severe weather events, including heatwaves, droughts, heavy rainfall and flooding, as well as rising sea levels and impacts on biodiversity. Reducing greenhouse gas emissions and increasing the use of renewable energy are important measures in addressing climate change.

Gathabawn Windfarm is a climate mitigation project. Electricity generated by a wind turbine without the emission of greenhouse gas, offsets the generation of electricity from fossil fuels which does emit greenhouse gases.

The effects on the following sensitive aspects of Climate were studied: **Climate Change (Global Atmosphere)**.

The **study area** is the Irish State and Ireland's commitments and targets under various National and EU Climate Agreements.

NTS of EIAR Section 12.3 Baseline Environment

A. Status of Ireland's Climate

The world's climate is changing rapidly with temperatures increasing faster in the last 50 years, than in any other 50-year period in the last 2000 years. Human influence has warmed the atmosphere, ocean and land, leading to widespread and rapid change, including changes to our weather system.

While the effects of climate change are global, according to The Status of Ireland's Climate 2020 (EPA, 2021), the following changes have been observed in Ireland:

- Greenhouse Gas emissions have continued to rise
- Annual average amounts of rainfall are increasing
- Aerosols - Atmospheric levels of sulphur over the 35-year period show an approximately 80% reduction, highlighting the success of regulation and technological advances.
- Annual average air and temperature is rising
- Sea levels continue to rise
- The ocean is becoming more acidic
- There is an increase in river flows across most of the country
- Land cover observations since 1990 show increases in the area covered by both artificial surfaces and forests and a decrease in wetland areas which include peatlands.
- Between 4,000 and 6,000 hectares are burned annually, with most fires occurring between March and June each year. Upland heaths and blanket bogs have the strongest association with fires.
- The total volume of trees and hence carbon sequestered in forest, increased by 38% between 2006 and 2017.

B. Climate Action

Renewable Electricity plays a crucial role in Ireland's efforts to combat climate change. Under the Climate Action Plans, Government plans to increase the proportion of Renewable Electricity to up to 80% by 2030 with targets of 9GW from onshore wind, 8GW from solar and at least 5GW of offshore energy by 2030.

According to the Climate Action Plan 2025, electricity emissions have decreased by 26.2% from 2018 to 2023 due to the increasing share of renewable generation and net electricity imports. Renewables accounted for 40.6% of electricity generation in 2025.

C. Evolution of the Baseline Environment (the 'Do-Nothing' scenario)

Under the Do-Nothing Scenario where the proposed Gathabawn Windfarm does not proceed, the renewable electricity from the windfarm will not be generated and the subsequent benefits of greenhouse gas offsets and the critical contribution to Ireland's Climate Action Plan and 2030 targets will not occur.

NTS of EIAR Section 12.4 Impact of the Proposed Development

A. Greenhouse Gas emissions from the full life-cycle of the development

Greenhouse Gas emissions will occur during the full life cycle (construction, operation, and decommissioning phases), of Gathabawn Windfarm. These emissions will be offset by the generation of renewable electricity from the operating windfarm.

Greenhouse Gas emissions from the development of Gathabawn Windfarm project will result in 835 tonnes CO₂e when averaged over the 35-year lifetime, associated predominately with the construction phase and very little during the operational maintenance activities. Construction phase sources of GHG emissions include landuse change; embodied carbon in the non-turbine materials – i.e. imported capping stone, concrete and other construction materials; and associated transport emissions; excavation, groundworks and landscaping works; construction activities; travel associated with site personnel; and wastes. Operational sources of GHG emissions include transport emissions for maintenance activities, maintenance wastes and associated transport.

B. Greenhouse Gas emissions from the manufacture of the turbines:

The wind turbines are expected to generate the same amount of energy used in their manufacture within approximately six months of operation. Modern wind turbines are also largely recyclable, with approximately 87% of their materials capable of being recycled following decommissioning, supporting the reuse of materials and reducing waste.

C. Mitigation Measures

Measures will be implemented throughout the development to reduce greenhouse gas emissions. These include using existing roads and tracks where possible, minimising vegetation removal and excavation, reusing materials available on-site and sourcing other materials locally to reduce transport.

Construction plant and vehicles will be operated efficiently and maintained to minimise emissions. Lower-carbon construction materials will be used where feasible, and opportunities to reuse and recycle materials will be identified. Waste will be managed appropriately during construction, operation and decommissioning.

D. Greenhouse Gas emission OFFSETS because of Gathabawn Windfarm

Greenhouse gas offsets have been calculated. The windfarm will generate c.150 million kilowatt hours of electricity per annum without emitting greenhouse gases. Based on the greenhouse gas emissions from the Irish Electricity Grid fuel mix of renewable and fossil fuel sources, this will result in greenhouse gas savings of 38,250 tonnes of greenhouse gases each year that would otherwise be emitted, if the equivalent amount of electricity was generated by the current fuel mix.

The estimated carbon savings from the windfarm would represent approximately 1% of the electricity sector's 2030 emissions limit, contributing positively towards Ireland's climate targets.

Overall the impact will be Positive for Climate.

NTS of EIAR Section 12.5 Cumulative Impact with Other Projects

Other projects within the cumulative study areas include a number of renewable energy projects – both windfarms and solar farms, all of which will contribute significantly and positively to Ireland's targets under the Climate Action Plan.

NTS of EIAR Section 12.6 Summary Conclusion

Although the construction phase has a negative, impact on the climate, the operational phase has a more substantial positive, impact. The carbon payback for wind turbines of the size proposed is 6.1 months, therefore across the 35-year lifespan of the turbines, the positive impact far outweighs the adverse.

In accordance with the EPA Guidelines (EPA, 2022), the effects of the whole Gathabawn Windfarm project GHG emissions on climate is direct due to its presence, long-term as a result of the estimated lifetime of the infrastructure, positive due to the displacement of fossil fuels through the production of renewable electricity and slight based on its overall contribution to global climate mitigation.

NTS of EIAR Chapter 13 Biodiversity

This study in Chapter 13 relates to Biodiversity which is Biodiversity is the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part.

Biodiversity was studied by **Inis Environmental Consultancy** team members who are scientific experts in various fields of ecology and biodiversity. The main ecologists involved in the biodiversity chapter were Dr Alex Copland Technical Director; Andrew Whitfield Associate Consultant; Howard Williams Principal Ecologist and CEO of INIS; Conor Daly Ecologist; Cillian Burke Ecologist; Katie Connolly Ecologist and Katie Sullivan Quality Control manager/field ecologist.

- **Consultation** was carried out with NPWS and Inland Fisheries Ireland.
- **Desktop studies** drew on a range of national, regional and European biodiversity sources, including NPWS, NBDC, EPA, Inland Fisheries Ireland, BirdWatch Ireland, Bat Conservation Ireland, The Heritage Council and relevant local authority plans. The review also considered applicable EU and Irish nature conservation legislation and policy, including the Birds and Habitats Directives, Wildlife Acts, Water Framework Directive, National Biodiversity Action Plan and All-Ireland Pollinator Plan. Satellite imagery and wetland mapping were also reviewed to identify potentially suitable habitats and areas of ecological interest.
- **Terrestrial Habitats:** Field surveys included habitat classification and invasive species surveys within and around construction areas, together with targeted surveys for terrestrial invertebrates, amphibians and reptiles. These included surveys for Marsh Fritillary and other butterflies, nocturnal amphibian surveys, and reptile surveys using basking mats and daytime observations.
- **Field surveys for terrestrial mammals** included general mammal walkovers, targeted badger and otter surveys, and the deployment of camera traps to record mammal activity.
- **Bat fieldwork** included activity transects, static detector monitoring, vantage-point surveys, roost assessments and emergence surveys, undertaken in accordance with relevant best-practice guidance.
- **Bird fieldwork** included breeding and wintering transect and vantage-point surveys, targeted raptor surveys, including Hen Harrier, Barn Owl, Peregrine and Kestrel, and surveys for breeding Woodcock and wintering waterbirds. Bird surveys were also undertaken at watercourse crossings, in accordance with relevant best-practice guidance.
- **Aquatic ecology fieldwork** included surveys of fish, aquatic habitats, White-clawed Crayfish, macro-invertebrates, aquatic plants and bryophytes. Aquatic habitat surveys assessed the physical characteristics and ecological suitability of watercourses and other freshwater habitats, supported by electrofishing, eDNA sampling and biological water-quality sampling.

The Biodiversity assessment was undertaken in accordance with relevant **EU and Irish EIA guidance and recognised ecological impact assessment guidance**, including guidance from the **EPA, CIEEM and NRA/TII**, together with established guidance for assessing effects of windfarms on biodiversity.

The Biodiversity evaluation of the EIA Report contains twelve **(12) Figures, mapping Terrestrial Habitats; Invertebrates, Amphibians and Reptiles, Terrestrial Mammals, Bats, Birds Raptor/Breeding Wader/iWEBS Survey/Birds Vantage Point surveys, Aquatic Habitat and Species, European Sites and Designated Sites.**

There are also eight (8) appendices to the Chapter including **Species Records held by NBDC; Invertebrates, Amphibians, Reptiles and Terrestrial Mammals Survey Data; Bat Survey Results; Bird Fieldwork & Survey Results; Collision Risk Modelling; and Aquatic Ecology Survey Results.**

Figures and Appendices accompany the EIA Report Chapter and are also available on the dedicated planning website www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 13.1 Sensitive Aspects of Biodiversity

The **Proposed Gathabawn Windfarm** is located within a predominantly agricultural landscape, dominated by improved grassland with hedgerows and scrub. **Cullahill Mountain SAC** adjoins the site at Ballylehaun, while the **River Barrow and River Nore SAC** and **River Nore SPA** are located downstream and are hydrologically connected to the site. These European sites and their protected habitats and species have been considered in the biodiversity assessment.

The effects on the following sensitive aspects of Biodiversity were studied: **Terrestrial Habitats, Invertebrates, Amphibians & Reptiles, Terrestrial Mammals, Bats, Birds, Aquatic Habitats & Species, Local Water Dependent Habitats, and Designated Sites.**

The **study areas** for the sensitive aspects of Biodiversity are as follows:

- **Terrestrial Habitats:** The construction works area plus 50m in all directions
- **Invertebrates** the construction works area plus 50m in all directions
- **Amphibians & Reptiles** the construction works area plus 50m in all directions
- **Terrestrial Mammals (Badger and Other Mammals)** the construction works area plus 100m in all directions
- **Terrestrial Mammals (Otter):** All watercourses within 300m of the works with suitable habitat.
- **Birds: Species/taxa dependent;** up to 5km from construction works areas
- **Bats:** Buildings within 500m of the construction works areas; Mature trees within 200m plus blade length of the proposed turbines; Linear vegetation features (e.g. hedgerows) of high suitability for foraging bats within the construction works areas; Structures within the construction works areas and along material haulage routes where works are proposed.
- **Aquatic Habitats & Species:** Sub-catchments associated with the works areas- i.e. Goul and Nore sub-catchments
- **Local Water Dependent Habitats:** Sub-catchments associated with the works areas- i.e. Goul and Nore sub-catchments
- **Designated Sites:** The assessment considered rivers, streams, wetlands and associated protected habitats and species downstream of the Proposed Gathabawn Windfarm where there is a potential pathway for effects through watercourses or other connections. This extends through the relevant River Nore catchments to the Nore Estuary and includes downstream European sites.
For Otter, the assessment also considered suitable resting and breeding habitat within 300 m of connected watercourses, together with foraging and commuting habitat close to the works. For Kingfisher, suitable downstream river habitat that could be used by birds associated with designated European sites was also considered.

NTS of EIAR Section 13.3 Baseline Environment

Terrestrial Habitats: The 50 m study area around the Proposed Gathabawn Windfarm covers approximately 190 ha.

Area Habitats: The site is dominated by improved agricultural grassland (74%), with improved grassland/dense bracken (4.7%). Smaller areas of more ecologically important habitats include dry calcareous and neutral grassland, rivers, Oak-Ash-Hazel woodland and scrub.

Linear habitats: These are features measured by length rather than area. Hedgerows account for approximately 64% and treelines approximately 17% of the linear habitats recorded.

Flora (Protection) Order FPO: No FPO 2022 species are present within, or in proximity to, construction works areas. Due to the suitable habitat within the Gathabawn Windfarm site boundary for this species, FPO Species are assessed in the impact evaluation section.

Devil's-bit Scabious, the larval food plant of the protected Marsh Fritillary butterfly, was recorded within the study area. Surveys in 2026 identified only approximately five individual plants, with no extensive stands present.

Invasive Species: Two stands of Japanese Knotweed, a High Impact Invasive Species, were recorded near the access track to Turbine 12. No other High Impact Invasive Species were recorded within the study area.

Invertebrates: Surveys undertaken between 2021 and 2026 found no Marsh Fritillary within the Proposed Gathabawn Windfarm study area. Its larval food plant, Devil's-bit Scabious, was only rarely recorded, and the predominantly improved agricultural grassland and Grid Connection route provide little suitable breeding habitat. However, given historical records in the wider area and the presence of the food plant, Marsh Fritillary is retained as a key ecological receptor on a precautionary basis.

Amphibians & Reptiles: Amphibian surveys were undertaken in April and May 2025, while reptile surveys were undertaken from June to September 2025, including reptile mat surveys in May. Suitable but generally limited habitat was identified for Smooth Newt, Common Frog and Common Lizard. Twelve adult Smooth Newts were recorded in a quarry approximately 60 m from the Proposed Gathabawn Windfarm, while no Common Frogs or Common Lizards were recorded. All three species are retained as key ecological receptors.

Terrestrial Mammals: Otter - dedicated Otter surveys were undertaken in 2025 and 2026. No suitable Otter habitat was identified within the Proposed Gathabawn Windfarm site, although suitable habitat and evidence of Otter were recorded on connected watercourses in the wider area, including the River Nore. Otter is a key ecological receptor. Badger - Surveys and camera trapping in 2025 recorded Badger activity, including paths, feeding signs and nine camera-trap records. A possible sett was also identified near the works. Badger is a key ecological receptor. Irish Hare - Camera trapping in 2025 recorded nine Irish Hare sightings, all within the Biodiversity Enhancement Area at Ballylehaun. Suitable grassland habitat is widespread and Irish Hare is a key ecological receptor. Pine Marten - No Pine Marten were recorded during the 2025 surveys, although suitable habitat and records occur in the wider area. Pine Marten is retained as a key ecological receptor on a precautionary basis. Red Squirrel - No Red Squirrel were recorded during surveys, but suitable woodland habitat occurs within and adjacent to the study area. Red Squirrel is retained as a key ecological receptor on a precautionary basis. Other Mammals - Irish Stoat, Hedgehog, Red Fox, Pygmy Shrew, Field Mouse and Red Deer were not identified as key ecological receptors. Brown Rat was the only invasive mammal recorded during field surveys.

Bats: Bat surveys in 2025 and 2026 recorded several species, with Common Pipistrelle the most frequently detected, followed by Soprano Pipistrelle and Leisler's Bat. Activity was generally Negligible to Low, although periods of Moderate to High activity were recorded for some species and locations. Most activity involved foraging and commuting along hedgerows and treelines. No bat swarming areas or migration routes were identified within or surrounding the Proposed Gathabawn Windfarm.

The Proposed Gathabawn Windfarm is within a Moderate suitability landscape for bats, with the bat assemblage assessed as being of Local Importance (Higher Value). Two Soprano Pipistrelle roosts at Ballyring are also Key Ecological Features. Based on recorded presence, activity and habitat suitability, Soprano, Common and Nathusius' Pipistrelles, Brown Long-eared Bat, Leisler's Bat, Daubenton's Bat, Whiskered Bat and Natterer's Bat are considered key ecological receptors.

Birds: The receiving environment in the proposed Gathabawn Windfarm supports a wide variety of general bird species of open countryside and farmland, in addition to some birds of prey and wader species. Some species are migratory species are only present during the summer or winter months within which they disperse widely over suitable habitat, whilst others are sedentary species and present throughout the year.

Survey effort: In order to determine the composition of the baseline bird population, bird surveys were carried out during winter 2022/2023, breeding 2025, winter 2025/2026, and breeding 2026.

Based on the activity recorded within the viewshed study area and the potential for impacts as a result of the Gathabawn Windfarm Project the following are considered Key Ecological receptors. Birds of Prey - Kestrel, Buzzard, Sparrowhawk, Peregrine, Barn Owl and Long-eared Owl. Kingfisher (grid connection). Passerines - Meadow Pipit, Redwing and Yellowhammer, Willow Warbler, Starling, Linnet, Swallow, Goldcrest, Greenfinch, House Martin, House Sparrow, Skylark, Tree Sparrow and Wheatear. Waders - Golden Plover, Snipe, Lapwing and Woodcock. Waterbirds - Black-headed Gull, Cormorant, Herring Gull, Lesser Black-backed Gull, Mallard, Mute Swan, and Whooper Swan.

Aquatic Habitats & Species: The River Nore is a Key Ecological Receptor due to its Natura 2000 designation within the River Barrow and River Nore SAC and the presence of protected aquatic species. Atlantic Salmon, White-clawed Crayfish, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel and Otter are of International Importance where populations occur within the SAC (in-situ). Atlantic Salmon, White-clawed Crayfish, River Lamprey, Brook Lamprey and Otter are also of International Importance where populations occur outside the SAC but are ecologically connected to it (ex-situ). Other fish species, including Stone Loach, Minnow and Three-spined Stickleback, are of Local Importance (Higher Value).

Local Water Dependent Habitats: Sixteen wetland areas occur within the same sub-basins as the Proposed Gathabawn Windfarm. However, there is no surface-water connectivity between the Windfarm and these wetlands, and no groundwater interactions are expected. Therefore, local water-dependent habitats are not considered Key Ecological Receptors.

Designated Sites: Designated Sites include European Sites, such as Natura 2000, Ramsar Site and Sites of National Importance. The Gathabawn Windfarm project does not overlap the boundary of any Designated Site, Ramsar Site or Important Bird Area. There are eight European Sites within the study area – one SPA and five SACs. Three European Sites – Cullahill Mountain SAC, River Nore SPA and the River Barrow and River Nore SAC have potential connectivity and were subject to further evaluation in the AA Report.

The nearest Ramsar site is the Slieve Bloom Mountains (Site number: 335), which is c.27km northwest of the Whole Gathabawn Windfarm Project. The Gathabawn Windfarm does not overlap the boundary of any pNHA site.

NTS of EIAR Section 13.4 Impact of the Proposed Development

13.4.1 Terrestrial Habitats

A. Examination of effects to Terrestrial Habitats with potential to be significant

Impacts to TERRESTRIAL HABITATS with potential to be significant were brought forward for detailed evaluation which are summarised in the sections below. **Construction, Operation, Decommissioning are signified by C, O and D**

Introduction or spread of terrestrial invasive species (C,O,D) - by Excavation and relocation of soils, movement of machinery.

Construction activities could introduce or spread invasive species through the movement of soil, machinery and equipment. Mitigation will include treatment of existing Japanese Knotweed, pre-construction surveys, machinery inspection and cleaning, specialist supervision near infestations, and continued monitoring.

These measures will prevent the project from introducing or spreading invasive species and ensure that any new infestations are identified and appropriately managed. As a result, no adverse change to biodiversity is expected following mitigation and the residual effect is assessed as Neutral.

Habitat enhancement and protection (C,O) - Preservation of parkland habitat and hazel woodland, creativity of connectivity corridor, planting/establishment of new hedgerows, and enhancement of existing hedgerows, creation of biodiversity pockets, restoration of dry-stone walls.

The Proposed Gathabawn Windfarm will protect and manage approximately 7 ha of Biodiversity Areas for its operational lifetime. This comprises 5.3 hectares of hazel woodland and 1.7 hectares of agricultural land, including 1 hectare at Ballyring for native habitat planting and a 0.7 hectare Biodiversity Connectivity Corridor at Ballylehaun linking areas of hazel woodland.

In addition to these 7 hectare of Biodiversity Areas, approximately 3.7 km of new native hedgerow, including 100 native trees, will be planted and 1.3 km of existing hedgerow enhanced. Stone walls will also be restored.

Together, these measures will protect and create habitats, improve ecological connectivity and provide additional foraging and refuge for mammals, birds and invertebrates. The overall long-term biodiversity effect is assessed as Slight Positive.

B. Effects on Terrestrial Habitat that will not be Significant

The following topics will not be affected significantly - Direct loss of Flora Protection Order Species; Direct disturbance/reduction in Terrestrial Habitats (excluding hedgerows and treelines); Hedgerow loss, severance and loss of trees; Landscape level habitat fragmentation; Surface or groundwater dependent habitat degradation; or Change in composition of Terrestrial Habitats due to Bat Buffer Zones.

C. Impacts to Terrestrial Habitats – CANDIDATE GATHABAWN GRID CONNECTION

No direct loss of protected Flora Protection Order species is expected. Permanent habitat loss will mainly affect improved agricultural grassland of low biodiversity value, with losses of other locally important habitats limited to less than 1%; overall habitat loss is therefore Not Significant.

There will be no permanent loss of hedgerows or trees. Temporary hedgerow and treeline removal associated with the Candidate Gathabawn Grid Connection will be replanted during construction. Given the limited and temporary nature of these works, landscape-level habitat fragmentation is also Not Significant.

13.4.2 Impacts to Invertebrates – Marsh Fritillary

A. Marsh Fritillary – Habitat loss/degradation (C,O,D)

No Marsh Fritillary colonies, larval webs or suitable stands of its food plant, Devil's-bit Scabious, were recorded within the proposed works areas. Therefore, no likely significant effects from habitat loss, mortality, disturbance or operational turbines are predicted during construction, operation or decommissioning.

As a precaution, the CEMP will include specific Marsh Fritillary mitigation. In the last available August/September before construction, the works areas and surrounding 100 m will be surveyed for Devil's-bit Scabious. Any plants within the works footprint will be cut to ground level in April/early May before construction to prevent establishment of new Marsh Fritillary colonies.

In the highly event that larval webs are identified, the NPWS will be consulted and appropriate protection measures implemented. These may include ecologist-supervised translocation of turves containing Devil's-bit Scabious to suitable nearby habitat, with the receiving ground prepared and the works timed to suitable weather conditions to maximise successful establishment.

13.4.3 Impacts to Amphibians & Reptiles – which will not be Significant

The following topics will not be affected significantly - **Loss, reduction or degradation of foraging and breeding habitat (C): Physical injury/direct mortality (C): Disturbance/displacement (C): Physical injury/direct mortality, disturbance or displacement (O, D):**

13.4.4 Impacts to Terrestrial Invertebrates or Amphibians – GRID CONNECTION

The Candidate Gathabawn Grid Connection does not overlap habitat suitable for Marsh Fritillary and No Likely Impact is predicted. Habitats along the Grid Connection are generally of low suitability for amphibians and reptiles, although suitable habitat occurs around watercourse crossings and the River Nore. Construction could cause temporary habitat loss or degradation, with a Moderate effect in the worst case, while direct mortality, disturbance and displacement are Not Significant. Operational and decommissioning activities will be limited and temporary, and significant effects on amphibians and reptiles are not expected.

13.4.5 Impacts to Otter

All of the effects of the Proposed Gathabawn Windfarm on Otter will be Not Significant. No suitable Otter habitat or watercourses occur within the Proposed Gathabawn Windfarm site, and no Otter were recorded during surveys within the site. Therefore, direct loss or degradation of Otter habitat and mortality, disturbance or displacement are unlikely.

Construction will involve no instream works in natural watercourses, and potential effects from sediment, hydrocarbons or concrete will be localised and controlled. During operation and decommissioning, groundworks, traffic and potential sources of contaminated runoff will be substantially reduced, resulting in Negligible to Neutral effects on water quality, Otter habitat and prey availability.

Overall, despite the high ecological sensitivity of Otter, effects from the Proposed Gathabawn Windfarm during construction, operation and decommissioning are assessed as Not Significant.

A. Impacts on Other Terrestrial Mammals

The proposed Gathabawn Windfarm has no likelihood of causing significant adverse effects to Other Terrestrial Mammal receptors. Construction will result in some loss of grassland, scrub and hedgerow habitat

used by Badger, Irish Hare, Pine Marten, Irish Stoat and Red Squirrel. However, habitat loss will be small relative to the extensive suitable habitat available in the surrounding area, and construction effects are assessed as Not Significant.

The biodiversity enhancement areas at Ballyring and Ballylehaun will provide additional foraging and resting habitat for several mammal species, resulting in a positive but Not Significant effect. No Badger setts, Red Squirrel drays, Pine Marten dens or Irish Stoat dens were recorded during the 2025 surveys.

During operation and decommissioning, activity will be limited, mainly during daylight hours and concentrated around existing infrastructure. Habitat effects and the potential for mortality, disturbance or displacement will therefore be Negligible to Neutral.

Overall, effects of the Proposed Gathabawn Windfarm on terrestrial mammals are assessed as Not Significant.

13.4.6 Evaluation of effects to Bats

A. Mortality of bats due to collision or barotrauma – Operation, Direct contact

Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat are considered at high risk of turbine collision, with the peak collision risk assessed as High before mitigation.

Mitigation includes maintaining a 50 m separation between turbine blade tips and trees and hedgerows, maintaining low vegetation within these buffer zones, and feathering idling turbine blades to limit rotation to 2 rpm. Operational bat activity and weather monitoring will also inform targeted turbine curtailment where high Leisler's Bat activity is identified.

Post-construction bat activity, roost and collision monitoring, including carcass searches, will be undertaken in Years 1, 2, 3, 5 and 10. Results will be used to assess the effectiveness of mitigation and identify whether further measures are required.

These measures reduce bat activity close to operating turbine blades and reduce the likelihood of collision. Following mitigation, residual effects are assessed as Imperceptible for low-risk species and up to Slight for high-risk species.

B. Impacts to Bats which will not be significant

All the remaining possible effects on Bats from Gathabawn Windfarm have been evaluated as not significant - Loss, reduction of feeding areas and/or severance of commuting routes (C, O, D): Destruction of bat roosts (C): Disturbance or displacement of roosting bats due to construction works (C): Disturbance or displacement of roosting or foraging bats as a result of operational turbines (O): Disturbance of roosting bats during operational phase maintenance and decommissioning works (O, D): Disturbance of foraging bats during operational phase maintenance and decommissioning works (O, D): Avoidance of roosting/foraging areas due to increased EMF (O)

13.4.7 Evaluation of the effects on Birds

A. Birds of Prey, Waders and Waterbirds: Collision risk

Collision risk was assessed for key bird species recorded at the Proposed Gathabawn Windfarm, including birds of prey, waders, gulls and swans. Predicted collision effects are generally low relative to national populations and are assessed as Not Significant before mitigation, although collision risk for key receptors ranges from Slight to Moderate.

Mitigation will include maintaining a 50 m separation between turbine blade tips and trees and hedgerows, maintaining low vegetation around turbines, and post-construction bird activity and fatality monitoring during Years 1, 2, 3, 5 and every five years thereafter. Monitoring will identify whether mortality exceeds predicted collision rates and whether further mitigation is required.

Following mitigation, residual effects are expected to be Not Significant for Kestrel and Neutral for Buzzard, Peregrine and Sparrowhawk.

B. Impacts on Birds which will not be significant

All the remaining possible effects on Birds from Gathabawn Windfarm have been evaluated as not significant - Birds of Prey: Destruction of nests, mortality of chicks (O, D): Birds of Prey: Disturbance and/or displacement (C): Birds of Prey: Disturbance/displacement from Operating turbines (visual presence and movement, noise) (O): Birds of Prey: Disturbance and/or displacement from maintenance activities and decommissioning works (O, D): Birds - General: Exposure to EMF (O): Passerines: Permanent or temporary reduction or loss or fragmentation of suitable habitat (foraging, nesting, roosting) (C,O,D): Passerines: Habitat Enhancement (C,O,D): Passerines: Physical injury/destruction of nests or chicks (C,O,D): Passerines: Disturbance/displacement from construction works areas (C): Passerines: Collision risk (O): Passerines: Disturbance/displacement from operational turbines, and from maintenance works/activities (O): Passerines: Disturbance/displacement from decommissioning works (D): Waders: Permanent or temporary reduction or loss or fragmentation of suitable habitat (foraging, roosting) (C): Waders: Physical injury/destruction of nests or chicks (C,O,D): Waders: Disturbance/displacement from construction works areas (C): Waders: Disturbance/displacement from operational turbines (O): Waders: Collision risk (O): Waders: Disturbance/displacement from operational maintenance works/activities and decommissioning works (O, D): Waterbirds: Permanent or temporary reduction or loss or fragmentation of suitable habitat (foraging, roosting) (C,O,D): Waterbirds: Physical injury, destruction of nests (C,O,D): Waterbirds: Disturbance/displacement from construction works areas (C): Waterbirds: Collision risk (O):): Waterbirds: Disturbance/displacement from operational turbine locations (O): Waterbirds: Disturbance/displacement from operational maintenance works/activities and decommissioning works (O, D)

13.4.8 Evaluation of effects to Aquatic Habitats & Species

A. Introduction or spread of invasive species (terrestrial, riparian, aquatic) – (C, O,D) Excavation and relocation of soils, movement of machinery

Proposed Gathabawn Windfarm - Two stands of Japanese Knotweed have been recorded within the Proposed Gathabawn Windfarm site. Construction activities could introduce or spread invasive species through the movement of soil, machinery and equipment. The risk is greatest during construction and lower during operation and decommissioning because of the reduced extent of groundworks and vehicle movements.

Mitigation will include continued specialist treatment of Japanese Knotweed, pre-construction surveys, inspection and cleaning of machinery and equipment, and specialist supervision of works within 7 m of an infestation. Annual invasive species surveys will be undertaken during operation, with further surveys before major maintenance and decommissioning.

Candidate Gathabawn Grid Connection - The Candidate Gathabawn Grid Connection will cross six watercourses, including the River Nore, which are connected downstream to the River Barrow and River Nore SAC. These watercourses provide a potential pathway for invasive species to spread into unaffected catchments, meaning that effects could potentially be significant without mitigation. Pre-construction

surveys, machinery inspection and cleaning, and specialist management of any invasive species identified will prevent their introduction or accidental spread during the works.

Following implementation of the mitigation measures, the residual effect from invasive species is assessed as Neutral.

B. Impacts to Aquatic Habitats and Species which will not be Significant

All the remaining possible effects on Aquatic Habitats and Species from Gathabawn Windfarm have been evaluated as not significant - Hydromorphological impacts due to instream works or works adjacent to wet drainage channels and watercourses (C): Hydromorphological impacts to downstream waterbodies due to changes to drainage regimes and surface water runoff (C, O, D): Habitat degradation on aquatic habitats and species due to reductions in water quality during construction (C): Habitat degradation on aquatic habitats and species due to reductions in water quality during operation and decommissioning (O, D): Disturbance/displacement/mortality of species of conservation importance (C):

13.4.9 Evaluation of effects to Designated Sites

A. Evaluation of Effects to Cullahill Mountain SAC - Indirect impacts to Annex I habitats and typical species due to Dust Soiling

The qualifying habitat of Cullahill Mountain SAC comprises semi-natural, herb-rich grassland and scrub on limestone, which is sensitive to nutrient enrichment and dust. Construction of the Proposed Gathabawn Windfarm near the SAC could generate dust, particularly from access roads, cabling and control building works at Ballylehaun. Without mitigation, worst-case dust effects could be Negative, Temporary to Short-Term and Moderate.

Mitigation will include dust monitoring and suppression, ecological monitoring of works close to the SAC, construction exclusion areas, vehicle speed limits, paving of the access road between T2 and T3, wheel washing and restrictions during unsuitable weather conditions. These measures will minimise dust reaching sensitive habitats within the SAC.

Following mitigation, only minimal dust contamination of sensitive habitats within Cullahill Mountain SAC is expected and effects are considered Neutral.

All of the remaining effects of the Proposed Gathabawn Windfarm on the Cullahill Mountain SAC will be Not Significant.

B. Evaluation of Effects to River Nore SPA, River Barrow & River Nore SAC Indirect impacts to habitats and to ex-situ mobile species as a result of reductions in water quality

Protected aquatic species, including lamprey, Atlantic Salmon and evidence of Otter, were recorded in downstream watercourses, while White-clawed Crayfish populations occur further downstream. The main windfarm works are separated from watercourses and no instream works are proposed, although facilitating works will occur close to the Ballyring Upper Stream. In a worst-case pollution or sediment-release event, the pre-mitigation effect is assessed as Negative, Temporary to Short-Term and Moderate.

The Candidate Gathabawn Grid Connection crosses watercourses with downstream connectivity to the River Barrow and River Nore SAC. Without mitigation, construction could release sediment or contaminants to these watercourses, potentially affecting protected aquatic species, Otter, Kingfisher and downstream water quality. Pre-mitigation effects could therefore be Potentially Significant.

Mitigation: Water-quality protection measures will include controlled storage and refuelling, spill-response procedures, concrete controls, treatment of pumped water, installation of drainage and sediment-control measures, weather-related restrictions and watercourse buffer zones.

With these measures implemented, the residual effect on aquatic ecology and water quality is assessed as Neutral.

C. Introduction or spread of invasive species (terrestrial, riparian, aquatic) (C, O, D) Excavation and relocation of soils, movement of machinery, drilling entry/exit pits, underground drilling

Two areas of Japanese Knotweed have been recorded at Ballyring and had not increased in extent as of September 2026. No other invasive species were recorded within 50 m of the windfarm works. However, machinery, vehicles and soil movements could introduce or spread invasive species, with the greatest risk occurring during construction. Without mitigation, effects could potentially be significant.

No invasive species were recorded along the Candidate Gathabawn Grid Connection during the 2026 surveys. However, trenching, watercourse crossings and the movement of machinery and excavated material could introduce or spread invasive species, potentially affecting terrestrial habitats and downstream protected habitats and species associated with the River Barrow and River Nore SAC and River Nore SPA. Without mitigation, effects could potentially be significant.

Mitigation will include pre-construction surveys of works areas and a 7 m buffer, inspection and cleaning of machinery and equipment, environmental monitoring, and specialist supervision of excavation or other works within 7 m of an invasive species infestation. These measures will prevent the introduction and accidental spread of invasive species.

Following mitigation, the residual effect from invasive species is assessed as Neutral.

D. Designated Sites: Mortality, Disturbance/Displacement impacts to SCIs and QIs in-situ and ex-situ as a result of watercourse crossings (C, O, D) - Movement of machinery, artificial lighting, human presence, drilling works.

Potential effects are limited to facilitating works approximately 5 m from the Ballyring Upper Stream and 50 m from the Foyle South Stream. Otter and Kingfisher occur along the River Nore. No Otter holts or resting sites were recorded within 500 m of the HDD crossing and no Kingfisher nests were recorded within 300 m. However, because works will occur within the River Barrow and River Nore SAC and close to the River Nore SPA, disturbance, collision and lighting effects cannot be excluded without mitigation. Instream works associated with other cable crossings could also temporarily affect Otter and potentially Kingfisher. Pre-mitigation effects are assessed as Potentially Significant.

Mitigation will include pre-construction surveys for Otter holts and Kingfisher nests, exclusion zones and timing restrictions where breeding or resting sites are identified, vehicle speed restrictions, and controls on construction noise and lighting. Lighting at the Parksgrove compounds and substation will be cowled and controlled by motion and time sensors to minimise light spill and operating periods.

These measures will avoid works within relevant disturbance zones where Otter or Kingfisher are present and minimise disturbance and collision risk. Following mitigation, the residual effect is assessed as Neutral.

All of the remaining effects of the Proposed Gathabawn Windfarm on Designated Sites along the River Nore will be Not Significant.

NTS of EIAR Section 13.5 Cumulative Impact with Other Projects

A. Cumulative Collision Risk or Displacement effects to Bats

Lisdowney Windfarm is the only operational windfarm within 2 km of the Proposed Gathabawn Windfarm, while the (pre-planning) Killoshulan Wind Farm is approximately 2.4 km away and other windfarms are more than 4 km away. Taking account of these separation distances, the existing Lisdowney Windfarm, bat buffers, habitat management and the availability of alternative suitable habitat, cumulative collision effects on bats are expected to be Low and Not Significant.

Disturbance and Displacement - Potential cumulative disturbance and displacement could arise from nearby developments, including Parksgrove Solar Farm and Parksgrove Substation. Woodland creation at Parksgrove Substation is intended to direct bat activity away from operational lighting and noise sources (Gathabawn grid connection effects). Together with habitat creation at Ballylehaun and the extensive suitable habitat remaining in the surrounding area, cumulative disturbance and displacement effects on bats are expected to be Low and Not Significant.

B. Cumulative Collision Risk or Displacement effects to Birds

Eleven bird species were assessed for collision risk at the Proposed Gathabawn Windfarm. Golden Plover was the only species for which a potential Slight significant effect was identified, arising from a single migratory flock. Other windfarms within 20 km were considered in assessing potential cumulative collision effects.

Disturbance and Displacement - Lisdowney Windfarm is the only operational windfarm within 2 km. Although it could contribute to a wider barrier effect for Golden Plover, Peregrine and Kestrel, survey results indicate that these species do not regularly use the Proposed Gathabawn Windfarm site for foraging or commuting. Significant cumulative disturbance or displacement effects with Lisdowney Windfarm are therefore not anticipated.

13.5.1 Cumulative Evaluation Summary

Interactions with other projects could occur during construction and operation. Where necessary, works will be coordinated and timed to avoid overlapping activities that could affect habitats, water quality or sensitive species. With these mitigation measures in place, the overall cumulative effect of the Whole Gathabawn Windfarm Project and other projects on biodiversity is assessed as Not Significant.

NTS of EIAR Section 13.6 Summary Conclusion

In the EIA report, the evaluation concluded that the impact to Biodiversity of the Gathabawn Windfarm, both alone and cumulatively with the Candidate Gathabawn Grid Connection and cumulatively with Other Projects will be **Not Significant**.

NTS of EIAR Chapter 14 Landscape & Visual Assessment

Chapter 14, The Landscape (Landscape and Visual Assessment) describes the landscape context of the proposed Gathabawn Windfarm and assesses the likely landscape and visual impacts of the scheme.

This Landscape and Visual Assessment report was prepared by Cian Doughan and Richard Barker Landscape Architects of **Macro Works Ltd**, a specialist Landscape and Visual Impact Assessment company.

Consultation with the Office of Public Works, desktop studies and fieldwork were carried out to gather information. A desk study involved reviewing the Kilkenny and Laois County Development Plans and research of tourism, heritage, and community features in those counties, establishing an appropriate study area and selecting potential viewshed reference points. Fieldwork included capturing reference photos for each viewshed reference location.

The evaluation for Landscape and Visual Impact Assessment has been carried out in accordance with industry and best practice guidance including the Institute of Environmental Management and Assessment *Guidelines for Landscape and Visual Impact Assessment* (2013); NatureScot Guidance - *Assessing the cumulative landscape and visual impact of onshore wind energy developments* (2021) and Wind Energy Development Guidelines (2006).

The Landscape Chapter 14 of the EIA Report includes a Photomontage Illustration Pack which include photomontages from 37 Viewpoints and Zone of Theoretical Visibility Maps. These can also be viewed on the dedicated planning website for the project www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 14.2 Sensitive Aspects

A study area of 20km radius from the Gathabawn Windfarm turbines was used for the effects on Landscape and Visual Amenity.

Although closely linked, landscape and visual impacts are assessed separately in the EIA report. **Landscape Impact Assessment** relates to changes in the physical landscape brought about by the proposed development, which may alter its character, and how this is experienced. **Visual Impact Assessment** relates to assessing effects on specific views and on the general visual amenity experienced by people.

NTS of EIAR Section 14.3 Baseline Description

A. The landscape baseline

The central study area consists mainly of gently rolling hills, with greater variation in elevation than the surrounding landscape. This gives the area a degree of visual interest, although steep or dramatic landforms are limited. The landscape is crossed by numerous small streams and rivers, including the Nuenna River, while the River Nore lies approximately 5 km east of the site.



Undulating terrain that is representative of the central study area

The wider study area generally comprises rolling countryside to the south, becoming flatter and more low-lying to the north and northwest. The Slieveardagh Hills form a more elevated area to the south, while the River Nore is a prominent landscape feature passing approximately 5 km east of the site.



Flat or marginally undulating land that is representative of the wider study area in the north and west

B. The Visual Baseline

The visual baseline is a consideration of locations that potentially afford views of the proposed development. Visual receptors include centres of population and houses; transport routes; tourism, recreation and heritage features; and scenic designations. A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate from where the Proposed Gathabawn Windfarm is potentially visible. The ZTV map is in the Photomontage Illustrations Pack as part of the EIA Report.

The ZTV indicates that there is potential for views of the proposed turbines across much of the study area, although the pattern of theoretical visibility varies in response to the surrounding terrain. Coverage is generally more consistent to the west of the site and more intermittent to the east, where the landscape is more undulating.

Beyond approximately 10 km to the west, the landscape becomes more low-lying. While some theoretical visibility occurs in these areas, views are not available from all low-lying ground and, in some locations, may be limited to turbine blades appearing above the horizon. Castlecomer and the north-western suburbs of Kilkenny City are outside the areas of theoretical visibility.

Most major transport routes within the study area, including the motorways, N77 and several regional roads, have the potential for views of the proposed turbines. Where theoretical visibility occurs, more than seven

turbines are generally indicated. Closer to the site, particularly to the north, east and southwest, the surrounding elevated and undulating terrain limits theoretical visibility in some areas to six turbines or fewer.

The ZTV represents a theoretical worst-case assessment and does not take account of screening from vegetation, buildings or other features. Actual visibility is therefore expected to be more limited than shown on the ZTV map, particularly where existing vegetation provides substantial screening.

Thirty-seven (37) locations (VRPs) were selected to study the landscape and visual impact of the proposed windfarm in detail. Photography was captured at these Viewshed Reference Points (VRPs), and computer generated images of the Gathabawn turbines were added to the photomontages to facilitate the assessment of visual and landscape impact of the turbines. The 37 photomontages are in the Photomontage Illustrations Pack as part of the EIA Report.

NTS of EIAR Section 14.4 Impact of the Proposal

A. Landscape Character Impacts

The Proposed Gathabawn Windfarm will increase the influence of wind energy within the local landscape, particularly close to the site where the turbines will become prominent features. However, wind energy is already present in the area and the development will be located within a working rural landscape characterised by agriculture, forestry, roads and dispersed settlement.

The broad, elevated landscape and the distribution of the 12 turbines across two clusters will help accommodate the development within the existing landscape. While the wind farm will result in a noticeable change in landscape character close to the site, the existing pattern of farmland, forestry, hedgerows and settlement will remain evident.

The influence of the wind farm will reduce with distance, with the turbines increasingly experienced as one element within the wider rural landscape.

B. Visual Amenity Impact

Impacts on Designated Views: The potential effects of the Proposed Gathabawn Windfarm on designated scenic views and routes in Counties Kilkenny and Laois were assessed using representative viewpoints.

The greatest visual effects are expected from the nearby County Kilkenny scenic route, approximately 1 km from the site, where the turbines will be noticeable in some views. Existing landform and roadside vegetation will provide screening in places. From other designated views in County Kilkenny, over 9 km away, the turbines will appear as distant features and effects are assessed as Slight.

From designated scenic views in County Laois, the turbines will increase the presence of wind energy in the landscape but will not significantly obstruct the main features of the protected views.

Impacts on Local Community Views: People living, working and travelling within approximately 5 km of the Proposed Gathabawn Windfarm are most likely to experience changes to views. Wind turbines are already an established feature of the local landscape; however, the proposed turbines will be prominent from some nearby locations and will result in noticeable changes to some views.

The extent of visibility will vary considerably due to the rolling landscape, roadside vegetation and forestry. In some locations the turbines will be screened from view, while elsewhere only some of the turbines will be visible. The assessed viewpoints include locations selected to represent some of the clearest and highest-impact views and are therefore not representative of views throughout the entire area.

While substantial-moderate visual effects are predicted at some of the closest viewpoints, the turbines are not considered to result in an overbearing effect on local communities. Overall, visual effects on the local community are assessed as Not Significant.

Impacts on Centres of Population: The main settlements close to the Proposed Gathabawn Windfarm include Freshford, Cullahill, Gathabawn, Lisdowney and Galmoy. Visibility of the turbines will vary between these settlements due to differences in distance, landform, buildings and vegetation.

The greatest effects are expected at Freshford and Galmoy, where visual effects are assessed as Moderate-slight. Effects at Lisdowney are assessed as Slight, largely due to screening by mature vegetation and surrounding terrain.

From settlements further away, views will generally be limited, distant or screened by vegetation, buildings and landform. Some settlements, including Castlecomer and parts of Kilkenny City, will have no theoretical visibility of the turbines. Overall, visual effects on settlements within the study area are assessed as Not Significant.

Impacts on Major Routes: The Proposed Gathabawn Windfarm will be visible from sections of the main road network, including the M8 and some national and regional roads. However, views will vary depending on distance, surrounding landform, roadside vegetation and the direction of travel. Roadside vegetation, cuttings and embankments will also screen or limit views from many locations.

The most noticeable effects are expected from sections of the road network closer to the site, while effects from more distant routes, including the M7, will be limited. Overall, visual effects on users of the major transport routes are assessed as **Not Significant**.

Impacts on Tourism, Recreational and Heritage Features: The Proposed Gathabawn Windfarm will be visible from some tourism, recreational and heritage locations, including local walking and cycling routes, GAA grounds and heritage sites. The most noticeable effects are expected along the Cullahill/Binnianea and Gathabawn Loop Walks and the North Kilkenny Cycle Route, where visual effects are assessed as **Moderate** in some locations.

Effects will generally reduce with distance and where vegetation, buildings or landform provide screening. More distant recreational and heritage locations will experience slight to imperceptible effects. Overall, visual effects on tourism, recreational and heritage receptors are assessed as **Not Significant**.

In summary, the Proposed Gathabawn Windfarm will result in noticeable visual changes, particularly at locations close to the site where the turbines are most visible. However, these higher levels of visual effect will be limited to relatively localised areas.

Visibility will vary considerably due to the rolling landscape, vegetation, forestry, buildings and viewing direction, with many locations experiencing limited or no views of the turbines. Where visible, the turbines will generally be seen within a working rural landscape where wind energy development is already present.

Overall, the visual effects of the Proposed Gathabawn Windfarm are assessed as **Not Significant**.

NTS of EIAR Section 14.5 Cumulative Impacts

There are ten existing/operational wind farms, one consented and four in-planning wind farms contained within the 20km study area. There is also one wind farm at the pre-planning stage located in the wider southern extent of the study area.

The Proposed Gathabawn Windfarm will increase the presence of wind energy within the local landscape, particularly when viewed together with the nearby Lisdowney Wind Farm. The greatest cumulative effects will occur at locations close to the site where existing and proposed turbines can be seen together.

Further from the site, the separation between Gathabawn Windfarm and other wind farms will substantially reduce the potential for cumulative effects. Overall, while there will be noticeable cumulative changes in some localised areas, the combined developments will not dominate the wider landscape. Cumulative landscape and visual effects are therefore assessed as **Not Significant**.

The potential future cumulative scenario considers existing, consented, in-planning and pre-planning wind farms within the study area. If all proposed developments proceed, there would be a notable increase in the number and presence of wind turbines, particularly within and around the Central Study Area.

The greatest cumulative effects would arise from the proposed Gathabawn, Killosullan and Seskin wind farms, together with the existing Lisdowney Wind Farm. While these developments would increase the prominence of wind energy within the landscape, the rolling terrain, vegetation and separation between developments will limit opportunities to view all of the wind farms together.

Overall, the potential future scenario would result in a **high-medium magnitude of cumulative effect**, with the greatest effects occurring from more elevated locations. However, the landscape is considered to have some capacity to accommodate this additional development. Potential future cumulative landscape and visual effects are therefore assessed as **Not Significant**.

NTS of EIAR Section 14.6 Conclusion

The Proposed Gathabawn Windfarm, comprising two turbine arrays at Ballylehaun and Ballyring, will result in noticeable landscape and visual changes, particularly close to the site. However, these higher effects will be localised and will reduce with distance due to the rolling landscape, vegetation and other screening.

Overall, the Proposed Gathabawn Windfarm will not result in any Significant landscape, visual or cumulative landscape and visual effects.

NTS of EIAR Chapter 15 Cultural Heritage

Chapter 15 of the EIAR presents the results of a cultural heritage impact assessment encompassing both buried archaeological remains and above ground-built heritage.

This chapter has been prepared by **SLR Environmental Consultants**. The SLR team members include Gwyneth McCullough Senior consultant; Katja Watson Senior Heritage Consultant; and Harleigh Broughton Project Heritage Consultant. Technical quality assurance was undertaken by John Trehy Technical Discipline Manager – Heritage.

Detailed consultation was carried out with the Department of Housing, Local Government and Heritage in January 2024 and with the National Monument Service, Kilkenny County's Kilkenny Heritage and County Laois' archaeologist in November 2025. The Office of Public Works were consulted in September 2026. Desktop studies of mapping and guidance relevant to Heritage were carried out. Fieldwork included a

- Site walkover survey in August 2025 and August 2026 to survey the proposed turbine locations, areas of proposed infrastructure, the grid connection option route, known archaeology and recorded geophysical features within the site.
- Geophysical survey by Archaeological Management Solutions between April and July 2023.
- LiDAR survey in December 2025

The evaluation for Cultural Heritage has been carried out in accordance with relevant national and regional planning and heritage guidance, professional archaeological standards, Transport Infrastructure Ireland guidance, and the EPA Guidelines for Environmental Impact Assessment Reports.

The Appendices to EIA Report Chapter 15 include

Appendix 15.2	Gazetteer of Assets
Appendix 15.3	Magnetometry Report
Appendix 15.4	Gathabawn LiDAR Survey Assessment
Appendix 15.5	Summary of Archaeological Excavations in the Study Area
Appendix 14.4	Visualisations for the designated assets for setting assessment

All Figures and Appendices are also available on the dedicated planning website
www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 15.2 Sensitive Aspects of Cultural Heritage

Sensitive Aspects of Cultural Heritage examined for effects from the proposed Gathabawn Windfarm are

Setting of Designation cultural heritage assets: Study Area - A 5km radius as measured from the proposed turbines; A 0.5km radius as measured from the Parksgrove Substation.

- **Direct impacts upon Designated cultural assets**
- **Non-designated cultural heritage assets (SMR assets, newly identified assets from desk-based or in-field baseline study) and**
- **Unrecorded Subsurface Sites;** Study Areas - A 1km radius as measured from the Construction Area, including Ballylehaun – Ballyring cabling. Study Area - A 0.5km study area from the Grid Connection

(Ballyring-Parksgrove Underground Cabling, Parksgrove Substation and the Parksgrove-Moatpark Underground Cabling).

NTS of EIAR Section 15.3 Baseline Environment

A. Known Heritage Assets within the Study Area

Historic mapping was reviewed to understand how the landscape around the Proposed Gathabawn Windfarm and Candidate Gathabawn Grid Connection has developed over time. This included the 17th-century Down Survey maps, the 1839 First Edition Ordnance Survey mapping, and later 19th and early 20th-century historic maps.

The mapping shows that the area has remained predominantly rural and agricultural, with changes mainly relating to field boundaries, forestry, farm tracks and agricultural buildings. While the overall landscape has changed relatively little, long-term farming activities such as ploughing and grazing may have affected the survival and condition of archaeological remains.

Evidence indicates considerable prehistoric activity in the wider area of the windfarm, including enclosures, fulacht fiadh (burnt mounds) and a ring barrow.

Two recorded enclosures are located very close to the windfarm works, including one approximately **10 m from the Site boundary** and another adjacent to the Ballyring section of the Site. Numerous additional prehistoric sites occur within the surrounding 1 km study area.

No recorded prehistoric heritage assets are located within the grid connection or cable link. Although prehistoric activity is recorded in the surrounding area, the archaeological potential within the grid connection development area is considered Low, particularly where works follow existing roads.

There are no recorded medieval heritage assets within the Windfarm Site boundary, although thirty are recorded within the surrounding study area. These are mainly ringforts, reflecting settlement and farming during the early medieval period. Several ringforts occur close to the Site, including one approximately 50 m from the Site boundary. Geophysical survey has also identified possible archaeological features associated with this ringfort. Other nearby medieval remains include a motte and bailey castle, moated site, tower house, church, graveyard and deserted settlement.

For the grid connection, the protected areas associated with two recorded ringforts are directly adjacent to the underground cable route and Parksgrove Substation. As associated archaeological remains could extend into previously undeveloped land, the potential for medieval remains in this part of the grid connection is considered high.

There are no recorded post-medieval heritage assets within the Windfarm Site boundary, although the walkover survey identified the remains of a lime kiln approximately 200 m from T6, which is also shown on the 1839 Ordnance Survey map. Other post-medieval features in the surrounding study area include a former mill, church and graveyard.

Historic mapping and LiDAR indicate that the Site has remained predominantly agricultural since the post-medieval period, with evidence of historic field boundaries, cultivation and possible farming structures.

No post-medieval heritage assets are recorded within the grid connection.

There are **no recorded modern heritage assets within the Windfarm Site boundary**. Two modern heritage assets occur within the surrounding study area: Creenkill National School, approximately 290 m southeast of

the Site boundary in Gathabawn, and Foyle Bridge, approximately 125 m south of the turbine transport facilitating works.

The Site has remained predominantly agricultural throughout the modern period, with little change in land use or the historic pattern of field boundaries.

There are no recorded modern heritage assets within the grid connection or its study area.

There are **no previously recorded undated heritage assets within the Windfarm Site boundary**. However, archaeological surveys have identified numerous features of possible archaeological interest within the Site. The 2023 geophysical survey identified 251 possible archaeological or natural features, while the 2025 LiDAR survey identified 239 potential archaeological features, with some overlap between the two surveys.

Many of these features appear to represent former field boundaries and enclosures associated with an earlier agricultural landscape, potentially dating from the medieval to post-medieval periods. Other features include possible settlement-related remains and evidence of burning. A further 15 recorded undated heritage assets occur within the surrounding 1 km study area.

There are no recorded undated heritage assets within the grid connection or its study area.

B. Built Heritage

Architectural heritage within the study area of the Windfarm Site mainly comprises traditional rural buildings, churches, farmsteads, small country houses and bridges. These include Saint Muntachan's Catholic Church and Creenkill National School in Gathabawn, as well as Foyle Bridge, approximately 125 m from the facilitating works.

The Windfarm Site does not form an important part of the setting of any designated architectural heritage asset, such as historic farmsteads, country houses, castles or other significant buildings. Built heritage within the grid connection study area includes Ballyconra House and a school, former mill and bridge at Ballyragget. Due to the nature and scale of the Grid Connection works, no direct or indirect effects on these built heritage assets are anticipated.

C. Intangible Cultural Heritage

Intangible cultural heritage includes local traditions, skills and cultural practices associated with communities and their landscapes. Practices identified in the wider area include hurling, making St. Brigid's Crosses, horse keeping, sheepdog training, set dancing, traditional music and beekeeping. The Windfarm and Candidate grid connection will not interfere with the locations, access, materials or agricultural activities associated with these traditions. Existing agricultural activities can continue around the development. Overall, no effects on identified intangible cultural heritage practices, traditions or crafts are anticipated.

NTS of EIAR Section 15.4 Impact of the Proposed Development

A. Evaluation of Impacts with Potential to be Significant

The following Legally Protected Sites were evaluated for impacts

- **Enclosure KK009-007** – (Direct impact Construction). There are no works associated with the proposed windfarm within the Zone of Notification for this asset. The Zone of Notification is located within the Ballylehaun-Ballyring cabling within the public road. However due to the previous truncation of the asset by the existing road, the cable corridor construction within the extent of the road would follow this section of previous impact upon the asset.

- **Ringfort – rath KK008-060001** (indirect impact Setting) The development would result in a noticeable change to the setting of the heritage asset, reducing how it is experienced and appreciated within the surrounding landscape. However, the asset itself and its archaeological remains would not be directly affected and would remain understandable within the wider landscape of ringforts. The magnitude of impact is assessed as Medium, resulting in a Moderate significance of effect.
- **Megalithic tomb KK008-124001** (indirect impact Setting) Up to nine turbines may be visible from the heritage asset at Mount Garret. However, they will not affect the key views to the south and west or the approach to the asset, which are important to its setting. The turbines will also not reduce the asset's sense of elevation or prominence within the landscape. The magnitude of impact on the asset's setting is therefore assessed as None, resulting in No Significant Effect.

Hillfort KK008-124002 (indirect impact Setting) Up to nine turbines may be visible from the hillfort in Mount Garret, approximately 5 km to the north and 6.5 km to the east. However, the key views to the east, south and west, which contribute to understanding its strategic and defensive position, will remain unaffected. Views to the north and northeast are more limited and extend mainly along the Mount Garret ridge. The turbines will not diminish the prominence or defensive character of the hillfort within the landscape. The magnitude of impact is therefore assessed as None, resulting in No Significant Effect.

B. Impact on potential archaeological remains identified through geophysical survey

Construction of the Gathabawn Windfarm could disturb or remove some of the potential archaeological features identified by surveys. As these features may range from natural features with no archaeological value to remains of Medium archaeological significance, the magnitude of impact is assessed as Medium to High Adverse. Before further investigation, the resulting effects could range from No Effect to Moderate/Significant. Where the cable passes through the Ballyring area, it will be installed within the proposed wind farm roads and will therefore cause no additional impact on potential archaeological remains in this area.

C. Impact on potential archaeological remains identified through LiDAR survey

Construction of the Gathabawn Windfarm could disturb or remove potential archaeological features identified by the LiDAR survey. In a worst-case scenario, complete removal could result in a High Adverse impact. However, most features are expected to be only partly affected, resulting in a Medium magnitude of impact at most. As the features may range from natural features with no archaeological value to remains of Medium archaeological significance, effects could range from No Effect to Moderate/Significant. Further investigation is required to confirm their archaeological significance. Where the Ballyring–Parksgrove underground cable passes through the Ballyring area, it will be installed within the proposed windfarm roads and will therefore result in no additional impact on potential archaeological remains.

D. Impact on Unknown prehistoric remains

The potential for previously unidentified prehistoric remains within the Gathabawn Windfarm Site is considered High. Recorded prehistoric enclosures and features identified by geophysical and LiDAR surveys indicate that parts of the Site may have been used for prehistoric settlement. Any surviving remains are likely to comprise settlement features such as enclosures and would generally be of Low to Medium archaeological significance. Construction could partially disturb or, in a worst-case scenario, remove archaeological remains. Effects could therefore range from Slight to, at most, Significant, although further archaeological investigation is required to establish the nature and significance of these features. The Ballylehaun–Ballyring underground cable will mainly follow existing roads and hardstanding. Although it passes through the notification zone of a recorded prehistoric enclosure, effects on this asset are not considered significant. The

potential for other prehistoric remains along the grid connection is lower, and any effects from the relatively narrow cable trench are expected to be Slight.

E. Impact on unknown medieval remains

There is a high potential for previously unidentified medieval archaeological remains within the Gathabawn Windfarm Site. This reflects the concentration of ringforts in the surrounding area and features identified by geophysical and LiDAR surveys that may represent settlements, enclosures, trackways and historic field systems. Any surviving medieval settlement or agricultural remains are considered to be of Low archaeological significance. In a worst-case scenario, their complete removal during construction could result in a High Adverse impact and a Moderate effect. For the grid connection, Parksgrove Substation is adjacent to the notification zone of a recorded ringfort, while another ring-ditch is approximately 35 m from the underground cable works. Construction could disturb previously unidentified remains associated with these monuments. The potential impact is assessed as Medium to High Adverse, resulting in a Slight to Moderate effect.

F. Mitigation Measures

Mitigation by Design: The layout of the Gathabawn Windfarm has been designed and refined to avoid or minimise effects on known and potential archaeological remains. This included changes to turbine locations and orientations, access tracks, underground cabling, borrow pits and the windfarm cable link, taking account of recorded monuments, their Zones of Notification, historic field boundaries and features identified through geophysical and LiDAR surveys.

Site boundaries were also revised to avoid the protected areas around several recorded enclosures and ringforts. Turbines T6 and T7 were micro sited to reduce their visual effects on the settings and important views associated with nearby ringforts.

These design measures prioritise the preservation of archaeological remains in situ.

Mitigation Measures during construction: The mitigation measures that will be implemented to protect archaeology and cultural heritage features during construction will ensure that effects will not be significant. Pre-construction archaeological investigations will be undertaken where required and agreed with the National Monuments Service (NMS). Works within Zones of Notification will require NMS approval

Areas of archaeological potential will be investigated, recorded or monitored during construction. A licensed Project Archaeologist will monitor initial groundworks, with test trenching or archaeological recording undertaken where potential remains may be affected. Protective fencing and construction staff briefings will also be used to protect nearby heritage features. Monitoring will also be undertaken at Parksgrove and Moatpark, with the scope of works agreed with the NMS.

An interactive public database will also be established and maintained to record and share local folklore and intangible cultural heritage associated with the Gathabawn area.

G. Impacts that do not have potential to be Significant

- Impact on Grangefertagh Round Tower & Church (NM 74), Ballylarkin Church (NM 282) and Rathealy, Ringfort (SM 376) (Setting – also shown in Viewpoints in Photomontage Illustrations)
- Impact on Enclosure KK009-023, Enclosure KK009-023, Ringfort KK009-014 during construction
- Impact on townland boundaries from windfarm and grid connection construction works

These sites are evaluated and the proposed development will not have a significant effect.

NTS of EIAR Section 15.5 Cumulative Impact with Other Projects

The cumulative impact of the existing Lisdowney Windfarm on the landscape setting of legally protected sites is considered in the evaluations as detailed above.

A 10 km study area was used to assess whether the Proposed Development, together with other consented or proposed developments, could result in cumulative effects on the setting of cultural heritage assets. No cumulative cultural heritage effects have been identified.

NTS of EIAR Section 15.6 Summary Conclusion

The cultural heritage assessment considered archaeological and built heritage information, supported by desk-based research, walkover, geophysical and LiDAR surveys. No recorded archaeological assets are located within the Proposed Gathabawn Windfarm Site boundary, although surveys identified a number of potential archaeological features and areas where previously unknown prehistoric or medieval remains may survive.

Potential direct effects on archaeological remains range from Slight to Moderate/Significant, depending on their nature and extent. Archaeological investigation and recording will be undertaken to preserve information where remains are affected. A Slight effect is predicted for the enclosure close to the grid connection.

Potential effects on the landscape setting of nearby heritage assets were also assessed. A Moderate effect is predicted for Gorteennamuck ringfort and a Slight effect for Rathlogan ringfort. Overall, the identified effects are not considered significant in EIA terms.

NTS of EIAR Chapter 16 Material Assets

Chapter 16: Material Assets evaluates potential effects of the Gathabawn Windfarm Project on roads, traffic, built services, telecommunication, television and aviation.

The evaluation of Public Roads and Road Users, Electricity system, landline telephone network, water supply pipes and wastewater pipes was carried out by Angeliki Kalatha Senior Transportation Engineer of **ORS Building Consultancy**. ORS also prepared the Traffic and Transportation Report which comprises Appendix 16.2

The evaluation of Telecommunication Network Links And Aviation was carried out by Kevin Hayes Senior Radio Planner / Engineer of **Ai Bridges**.

Consultation with Uisce Eireann, ESB Networks, EIR, Transport Infrastructure Ireland (TII), Three Ireland, Vodafone, 2RN, An Garda Siochana, IAA, Coimisiún na Meán, BT Ireland, CIE, Enet, Imagine Broadband, Kilkenny County Council, Tetra Ireland, Viatel and Virgin Media informed the various studies.

A desk study was completed, which included reviewing mapping and databases of local service providers, modelling microwave radio link paths and conducting Radio Path Profile and Radio Link Budget analysis. Fieldwork included a survey for any existing underground services and overhead lines within 20 metres of the works areas, passing traffic volume data collection and assessment, surveys of buried structures and of masts.

The evaluation for Material Assets has been carried out in accordance with Environmental Protection Agency guidance document *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA,2022) along with the ARVI approach for impact significance assessment.

Figures of interest in the EIAR Report

- Figure 16.1 Local Roads and Site Entrances along the Windfarm Construction Access Route
- Figure 16.2 Turbine Delivery Route

See also Appendix

- Appendix 16.2 Traffic & Transport Assessment
- Appendix 16.3 Telecommunication Impact assessment comprises
- Appendix 16.4 Aviation Review Statement comprises

Figures and Appendices are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

NTS of EIAR Section 16.2 Sensitive Aspects of Material Assets

Roads and Built Services Environment: The Proposed Gathabawn Windfarm site is served mainly by lightly trafficked local roads, with the N77 and regional roads providing the main strategic access. The villages of Gathabawn and Lisdowney are located along the proposed construction access routes.

Local services mainly comprise overhead electricity lines. There are no major water, wastewater or gas services close to the Windfarm Site, although electricity, water and gas infrastructure is present along parts of the Grid Connection, particularly around Parksgrove and Moatpark.

Telecommunications and Aviation Environment: Telecommunications infrastructure in the area includes several masts providing mobile and broadband services, including two small broadband masts within the

Windfarm Site. There are no airports, airfields or helipads within 10 km of the proposed turbines. The nearest airfields and heliports are between 10 km and 20 km away, while the nearest major airport, Waterford Airport, is approximately 68 km from the Site.

The effects on the following sensitive aspects of Material Assets were studied: **Public Roads and Road Users, Local Built Services, Electricity Transmission & Distribution System, Telecommunications Signals and Networks, and Aviation.**

The **study areas** for the sensitive aspects of Material Assets are as follows:

- **Public Roads; Road Users:** Regional Roads and Local Roads used during the material and turbine component transportation
- **Local Built Services:** Underground and overhead services within 10 metres of the boundary of construction works.
- **Electricity Transmission & Distribution System:** National electricity network within 10 metres of construction works, and proposed connection point of the grid connection associated with the windfarm
- **Telecommunications Signals and Networks:** telecoms signals and services emanating from mast-site infrastructure identified during the telecom operator consultations.
- **Aviation:** This airspace in the vicinity of Gathabawn, constitutes the assessment area. As part of the study, the aeronautical network infrastructure (aerodromes, radar sites, NAVAIDs, etc.) that are used to manage aviation activities in the vicinity of the proposed development have also been considered.

NTS of EIAR Section 16.3 Baseline Environment

Public Roads: Construction haulage to the Proposed Gathabawn Windfarm will use routes from the N77 national road: via the R639 at Durrow to the Ballylehaun Area (using the L58141), and via the L1807 at Parksgrove, through Lisdowney, to the Ballyring Area (using the L1806 and L18062). Site entrances have been designed to achieve appropriate sightlines, with two temporary entrances also proposed on the L1804 and L1806. Road widening is proposed on the L58141 and L18062 to facilitate delivery of turbine components and construction materials, and a new temporary access road is proposed between the L1804 and L1806 (facilitating works for turbine transportation FW8) to bypass the L1804/L1806 junction at Foyle Bridge during turbine blade deliveries.

Road Users: Traffic surveys were undertaken in 2026 to establish existing traffic volumes, vehicle types, speeds and movements at key junctions around the Proposed Development. Census information and local planning records were also reviewed. The local road network is generally lightly trafficked and has sufficient capacity to accommodate construction traffic.

Local Built Services: There are no Uisce Éireann built services or Group Water Schemes in the vicinity of the Gathabawn Windfarm site. Similarly, there are no national gas supplies in the area. Overhead telephone and fibre internet lines occur along roadside boundaries and connect to local residences in the area. Consultation with Eir shows infrastructure along the roadside boundary at the locations of turbine transportation facilitating works FW8, FW9 and FW10.

Electricity Transmission & Distribution System: Local electricity services (connected to local residences) are made up of lower voltage overhead electricity lines which are generally located in fields close to the local roads. There are 3 no. overhead electricity lines within 10m of the construction works boundary associated with facilitating works FW1 and FW2 at the Ballylehaun Area, with one of these overhead lines crossing over an area of public road widening along the L58141. There is also 1 no. overhead electricity line crossing over the construction works area for facilitating works FW7 at Site Entrance No.3, at the Ballylehaun Area. At the

Ballyring Area, there is 1 no. overhead electricity line which crosses through the construction works boundary southwest of the T8 hardstand.

Telecommunications Signals and Networks: Telecommunications masts at Ballyspellan and Tinnaslatty connect with masts at Oldglass and Springfield to the north and Freshford to the southeast. Point-to-Point (PTP) microwave radio links associated with Ballyspellan and Tinnaslatty pass over the Windfarm Site. A separate 2RN radio link between Kilduff and Mount Leinster passes to the south of the Site.

Aviation: The nearest significant airports to the proposed Gathabawn Windfarm are Waterford Airport (68km to the southeast) and Shannon Airport (96km to the west of the windfarm site).

The nearest of the Air Corps restricted area to the proposed Gathabawn Windfarm is the low-level flight route around the M8 motorway.

The Garda Support Unit operate a fixed wing aircraft and two helicopters out of Casement Aerodrome at Baldonnel, c.90km from the windfarm site.

The Emergency Aeromedical Service operates from Custume Barracks in Athlone and Rathcoole Aerodrome in Mallow, c.75km and c.125km from the windfarm site respectively.

There are no existing private airfields within 10km of the proposed Gathabawn Windfarm. Within the wider area, there are three airfields and one helipad within 20km - Abbeyleix Airfield (13km to the northeast), Kilkenny Airport (15km to the southeast), Moyne Aerodrome (17km to the southwest) and Midlands Heliport (17km to the northeast).

NTS of EIAR Section 16.4 Impact of the Proposed Development

A. Impacts that will not be significant

the following effects of the Gathabawn Windfarm Project have no likelihood of causing significant adverse effects. The evaluations show effects ranging from No likely to Slight at the most.

Public Roads Impacts

- Damage to National Road and Regional Road pavements/decrease in structural integrity
- Damage to Local Road pavements or decrease in structural integrity due to trenching works, road widening works and due to site entrances and construction traffic
- Damage to road boundaries
- Damage to bridges and culverts
- Interrupted or disrupted access to property
- Damage to existing TII infrastructure

Road Users Impacts

- Increased journey times for National, Regional Road or Public Road users
- Increased journey times and disruption for road users due to transport of turbine components
- Increased risk of road accidents due to increased traffic, road works, or deterioration of road pavements
- Improvement in public road networks due to increased County Budget of road accidents due to increased traffic, road works, or deterioration of road pavements

Local Built Services Impacts

- Damage to overhead electricity lines
- Impact of new infrastructure connected to the electricity transmission system
- Damage to local built services

B. Environmental Protection Measures for Public Roads/Road Users/Built Services

Road Condition: Road condition surveys will be undertaken before and after construction, with any construction-related damage repaired to at least its previous condition.

Road Works: Road widening will be undertaken in consultation with Kilkenny County Council and in accordance with relevant road-opening and reinstatement guidance.

Road Protection and Cleanliness: Excavated material will not be stored on public roads, and road sweepers will be used to keep affected roads clean.

Roadside Boundaries: Existing roadside boundaries will be maintained where possible, with temporary fencing installed where boundaries are removed for road widening or visibility.

Site Access: Roadside vegetation will be maintained to provide safe visibility at site entrances.

Traffic Management: A Traffic Management Plan will be implemented in consultation with Kilkenny County Council to safely manage construction traffic and temporary road restrictions.

Traffic Control: Flag personnel and appropriate signage will be used where required to maintain safe traffic movements.

Local Communication: A Community Liaison Officer will keep affected residents informed of road works and construction schedules.

Construction Traffic: Deliveries will be coordinated to avoid additional deliveries during turbine foundation concrete pours, and road widening and site entrance works will be completed before the main construction works.

Road Safety: A road safety and courtesy protocol will be implemented, requiring construction vehicles to give particular consideration to pedestrians and cyclists.

Existing Services: Service providers will be consulted and surveys undertaken before works near overhead or underground services. Overhead lines will be clearly marked where required.

Construction Management: Construction Method Statements will incorporate the mitigation and monitoring measures set out in the Environmental Management Plan.

Dust Control: Dust will be monitored throughout construction, with roads inspected, swept and watered as required and dusty loads covered during transport.

Traffic Safety: Reduced speed limits will be implemented on local roads and within the Windfarm Site.

Community Liaison: A Community Liaison Officer will provide a point of contact for local residents during operation and decommissioning.

C. Impacts to Telecommunication Networks with potential to be significant

Interference with Three Ireland and Vodafone Link Paths during the Operation Phase: Desktop modelling of local radio links found that two radio links are likely to be affected by the proposed Gathabawn Windfarm turbines – Three link between Tinnaslatty and Freshford, and a Vodafone link between Ballyspellan and Oldglass. As these signal paths could be obstructed by the turbines, the impact on these links is considered to be significant without any remedial measures being implemented. However, mitigation measures are readily available within the Operators networks.

Telecom operators will be contacted prior to the erection of the permitted wind turbines to confirm

(1) requirement for mitigation measure, and

(2) form of mitigation measure to be implemented – i.e. change of signal pathways to relay the existing signal pathways around the turbines using other existing masts in the surrounding area, or installation of telecom apparatus onto the windfarm met mast.

The mitigation measures will effectively resolve any radio link path obstruction by relaying the signals to other masts in the surrounding area to avoid the signals being relayed through the windfarm site. Therefore, with the implementation of this effective mitigation, there will be no residual impact of the Proposed Gathabawn Windfarm Turbines on Three Ireland or Vodafone radio links in the area.

D. Impacts to Aviation - Not Significant

Impact on aviation from operational Gathabawn Windfarm turbines during the operating phase:

- **Airport Operations:** The proposed turbines are sufficiently distant from Shannon and Waterford Airports and will not affect their protected airspace, flight procedures, radar, communications or navigational systems.
- **Military Aviation:** Part of the Windfarm Site lies within an Irish Air Corps Restricted Area. The developer will consult with the Irish Air Corps regarding aviation lighting requirements.
- **Aviation Safety:** The developer will consult with the Irish Aviation Authority (IAA) to agree an appropriate Aeronautical Obstacle Warning Light Scheme.
- **Emergency Aviation:** No effects on Garda Air Support Unit or Emergency Aeromedical Service operations are anticipated.

E. Mitigation Measures for Airbourne Signals

Telecommunications: Operators will be consulted before turbine erection to confirm whether mitigation is required. Measures may include changes to telecommunications equipment, rerouting signals or installing equipment on the wind farm meteorological mast.

Aviation Safety: The Irish Aviation Authority (IAA) will be notified before crane operations. Final turbine coordinates and elevations will be provided, and an appropriate aviation warning lighting scheme will be agreed with the IAA.

Television Signals: The developer will follow the 2RN Protocol Agreement to address any turbine-related television interference. Where required, measures may include adjusting or relocating TV antennas, retuning to an alternative transmitter, or providing SaorSat satellite television, with associated installation costs covered by the developer.

NTS of EIAR Section 16.5 Cumulative Impact with Other Projects

Taken together, it is evaluated that adverse cumulative impact to Local Roads and Road Users, and Local Built Services of the Proposed Gathabawn Windfarm cumulatively as a whole and with Other Projects will be Not Significant

NTS of EIAR Section 16.6 Summary Conclusion

Traffic and Transport: Local roads are generally lightly trafficked and key junctions will remain within capacity. Effects from delays to road users are Imperceptible to Slight, while residual effects on public roads are Slight and Not Significant. No significant increase in road accident risk is anticipated.

Built Services: Effects on existing electricity, water and gas services are expected to be Neutral, with no significant effects anticipated.

Telecommunications and TV: Following mitigation, no residual effects on telecommunications links or television reception are expected.

Aviation: No significant effects on aviation are anticipated, with turbine lighting to be agreed with the IAA and Irish Air Corps.

Overall, residual effects on **Material Assets are Not Significant**, including cumulative effects.

NTS of EIAR Chapter 17 Population

Chapter 17 of the EIA Report evaluates the socio-economic implications of the Whole Gathabawn Windfarm Project and was carried out by Ciara Morley, (Ph.D. and M.A. in Economics and Finance) Director at **Morley Economic Consulting Ltd**, with more than 15 years' experience in socio-economic analysis, regional development, and Economic Impact Assessments, across a broad range of sectors.

A range of national, regional and local information sources was reviewed to establish the existing environmental and socio-economic context of County Kilkenny. These included CSO population and economic data, Kilkenny County Council plans and reports, tourism strategies prepared by Fáilte Ireland, regional skills information from SOLAS, and other relevant tourism research. The information was used to describe existing population, economic activity, tourism and employment within the study area. Site visits were undertaken to establish the extent of settlement patterns, amenities and local businesses.

Figures of interest in the EIAR Report

- Figure 17.2.2 Local Population
- Figure 17.2.3 Tourism Products and Attractions

Also available on the dedicated planning website www.gathabawnwindfarmplanning.ie

The evaluation for Population & Human Health has been carried out in accordance with industry and best practice guidance, including the Environmental Protection Agency, guidance document *Guidance on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022), and the *Social Impact Assessment in Environmental Impact Assessment in the UK* (ISEP, 2025).

NTS of EIAR Section 17.2 Sensitive Aspects of Population

Population in the local environment relates to the people and local communities living and working in the area. This includes people's way of life and the local economy.

- The effects of the proposal on **Local Populations & Local Economy** were studied

The **study areas** for the sensitive aspects of Local Population & Local Economy are as follows:

- Electoral Divisions (EDs): Cullahill, Glashare, Balleen, Lisdowney, Ballyconra, Ballyragget Electoral Districts – Eds within 2km from the wind turbines
- 3km from the turbines - the core Areas of Benefit for the Community Benefit Scheme
- The regional Durrow to Johnstown Road and local roads in the vicinity of the windfarm and likely grid connection route, which will be subject to increased construction site traffic.
- Villages, towns, industry and tourism products within 5km of the project
- 20km from the turbines - tourism products in the wider area

NTS of EIAR Section 17.3 Baseline Environment

The Local Community

The proposed windfarm development is within three Electoral Divisions (EDs), namely Cullahill ED, Glashare ED, Balleen ED and Lisdowney ED. The nearest County Kilkenny towns and villages to the Gathabawn turbines are:

- Gathabawn village, 1km southeast of the nearest Ballylehaun turbine, 3km from Ballyring turbines
- Lisdowney village, 3km northeast of the Ballyring turbines, and 6km from the Ballylehaun turbines
- Freshford town, 4km from the Ballyring turbines, and 7km from the Ballylehaun turbines
- Ballyragget town, 6km from Ballyring, and 10km east of Ballylehaun
- Johnstown town, 6km from Ballylehaun, and 9km from Ballyring
- Urlingford town, 9km from the Ballylehaun turbines, 12km from Ballyring

In neighbouring County Laois

- Cullahill village, 3km northeast of the nearest Ballylehaun turbine, 6km from the Ballyring turbines
- Galmoy village, 5km to the west of the Ballylehaun turbines, 9km from the Ballyring turbine
- Durrow town (Co. Laois) 8km to the northeast of the Ballyring turbines, 9km from Ballylehaun turbines

Road Infrastructure: The road network around the windfarm comprises mainly local roads, with the regional road R639 Durrow to Johnstown Road to the west of the Ballylehaun turbines, and the M8 Motorway further to the west. The N77 national secondary road which links Kilkenny City to Portlaoise via Ballyragget and Durrow towns is located to the east and north of the Project. The likely grid connection cabling crosses under the N77 (drill under road) at Parksgrove.

Other Infrastructure: There is an existing 4-turbine wind farm – Lisdowney Windfarm, on lands to the north of the Ballyring turbines, and to the east of the Ballylehaun turbines. This wind farm has been in operation since 2016.

Industry: A notable socio-economic feature of the wider local area is the large Tirlán dairy processing plant, located off the N77 road in Ballyconra townland, 2km from Ballyragget town. This plant is an important employer in the area, and many of the farms locally supply milk to this plant.

Traditionally, mining has been another important employer to the west of the Gathabawn Windfarm Project, associated with mines in the Galmoy and Lisheen areas.

Settlement Patterns

The Study Area had a population of 3,303 in 2022, representing an increase of approximately 20% since 2002. The strongest growth occurred in Lisdowney ED, where the population increased by 53.5% over the 20-year period. Growth in Lisdowney has been particularly strong in recent years, increasing by 18.3% between 2011 and 2016 and by a further 13.9% between 2016 and 2022.

The Study Area is typical of a rural upland area in Ireland and agriculture and commercial forestry are the predominant land uses in the vicinity of the site. The area around the proposed wind farm is sparsely populated with a dispersed and low population – with 65 houses within 1km of the proposed Gathabawn wind turbines, and a further 209 houses between 1km and 2km from the turbines. Once-off residential properties and farmsteads are dotted along the third-class routes that service the locality. Residential dwellings are also clustered in the villages of Gathabawn, Lisdowney, Cullahill and further away – in the towns of Freshford, Johnstown and Ballyragget.

Tourism Products

There are three walks identified within the study area:

- The local Gathabawn Rural Development Group host an annual charity walking event along the Gathabawn Loop, on St. Stephens Day every year.
- The Mac Giolla Phadraig Way Walk is an annual walk which takes place on the October Bank Holiday weekend, and some organised walks also held at Easter.
- Laois Walks Festival often includes guided historical and scenic treks around Cullahill Mountain.
- Cullahill Mountain Climbs provides guided seasonal walks which includes the Healthy Way and Binneanea loops.

Also, cycling trails in the area include the North Kilkenny Cycle Route and the Laois Cycle Route which follow local roads in the area, including through Gathabawn and Lisdowney villages.

In relation to scenic route/viewing location within 5km that look in the direction that the proposed Gathabawn Windfarm, the most relevant are

- Kilkenny Scenic view V14: Views north and east on the Johnstown/Gathabawn Road No. LP1805 between junctions with Road nos. LT18054 and LT18056.
- Laois Scenic view V004: Road No. L5753 in the townlands Cullahill. Views towards Knockmannon Hill

There is limited tourist accommodation within 5km of the Proposed Gathabawn Wind Farm. There are c. 24 tourism accommodation properties (including B&B residences, Airbnb, hotels) in the area, many of which are located in Freshford.

Community Benefit Fund

Within the area, the local community will benefit directly from the Gathabawn Windfarm Community Benefit Fund (CBF) which will be circa €300,000 per annum depending on electricity production. The Fund will be operated in accordance with the Government's Renewable Energy Support Scheme (RESS) Community Benefit Fund rules. The Fund of circa €300,000 will be paid every year irrespective of whether Gathabawn Windfarm is a participant in RESS or other Government price support scheme, or not.

The Community Benefit Fund will be managed locally and distributed annually in accordance with Renewable Energy Support Scheme (RESS) Rulebook. The Community that lives close to the development is the beneficiary of the CBF. A locally recruited CBF committee will be responsible for setting the direction of the Fund, the geographical area and making funding decisions. The CBF may define the Area of Benefit of the Fund, taking into consideration the Fund's resources and the number of households located in the vicinity of the windfarm. The Fund will operate a near neighbour scheme of direct payments to local residents in the vicinity of the windfarm annually and will also provide sustainable funding for local community organisations such as community clubs and projects, local schools, local tourism projects, local sport clubs and home energy efficiency programs.

Commercial Rates

Commercial rates payments to Kilkenny County Council of c.€800,000 per annum, for the lifetime of the windfarm will also deliver a positive benefit to the people of County Kilkenny.

Community Report

A Community Report has been prepared. The Report details the community engagement plan for the development. It also provides an overview of the Gathabawn Windfarm proposal and the context of the windfarm as a new renewable electricity development in the area and the benefits that will accrue to the local community and to wider society, should planning be granted for the development.

The Community Report is a standalone document as part of the Planning Application and can be found on

- Dedicated planning website at www.gathabawnwindfarmplanning.ie or
- Community Website at www.ecopowergathabawn.ie

NTS of EIAR Section 17.4 Impact of the Proposed Development

A. Evaluation of Impacts with Potential to be Significant

The following Local Population/Local Economy sensitive aspects were evaluated in detail

Decrease in Property Prices during the Operational Phase: Potential effects on residential property values were considered for properties located within 1 km and 2 km of the Proposed Gathabawn Windfarm.

No reliable evidence has been established in Ireland of a direct relationship between proximity to wind farms and reductions in residential property values where operational effects, such as noise and shadow flicker, remain within permitted limits.

International studies have reached similar conclusions. Research in England and Wales examined over 82,000 property transactions within 5 km of seven wind farms (1995–2013) and found no evidence of an adverse effect on property prices. Studies in Scotland (1990–2014) and Ontario, Canada, involving over 7,000 property transactions, similarly found no consistent or statistically significant negative effect.

Property values are influenced by a wide range of factors, including housing supply and demand, local economic conditions and wider market trends. The Proposed Gathabawn Windfarm will also provide a Community Benefit Fund of approximately €300,000 per annum during its operational phase, including payments to near neighbours within 1km and a smaller payment within 2km of a turbine.

Given the relatively low number of residential properties within the 1 km and 2 km assessment areas, and having regard to the available research evidence, significant adverse effects on residential property values are not considered likely. Most properties within the assessment area are expected to experience effects of low magnitude, although properties closest to the proposed Windfarm, particularly those within 1 km, may experience effects of medium magnitude.

Overall, while it is considered that houses prices in the long term will be more adversely affected by supply and demand dynamics and the response of global markets to the effects of climate change. A suite of mitigation measures are included in the EIA Report to protect the amenity of properties in the vicinity of the Proposed Gathabawn Windfarm project. These will be implemented during the construction, operation and decommissioning phases through the Environmental Management Plan. Furthermore, the windfarm will be required to comply with any planning conditions relating to the windfarm, in particular in relation to noise and shadow flicker.

Distribution of the Community Benefit Fund: The Gathabawn Windfarm will provide a Community Benefit Fund of approximately €300,000 per annum for the lifetime of the Windfarm. According to the Community Fund Rules, the 65 households within 1 km of a turbine will each receive €1,000 per annum, representing approximately €65,000 annually. Households located between 1 km and 2 km are proposed to receive between €500 and €1,000 per annum, depending on their distance from a turbine and the arrangements approved by the Community Benefit Fund Committee.

Direct payments to households will be limited to a maximum of 50% of the annual Community Benefit Fund (approximately €150,000). The remaining Fund will be available for eligible local community initiatives, including clubs, schools, tourism and community projects, sport and home energy-efficiency programmes. The precise annual amount available for these initiatives will depend on the final allocation of the Fund, including payments to qualifying households.

In the context of the overall size of the local economy (particularly the EDs of Glashare, Balleen, and Lisdowney) the magnitude of this additional contribution is considered to be Medium. However, given the localised nature of the fund, the effect is considered to be slight and positive.

B. Mitigation Measures

A Community Liaison Officer (CLO) will be appointed for the duration of the operational phase of the Windfarm and will act as the principal point of contact between the Project and the local community.

The Community Benefit Fund will be administered in accordance with the Government's RESS Community Benefit Fund requirements.

Following construction and commissioning, the Environmental Management Plan (EMP) will be updated for the operational phase. A suitably qualified Environmental Manager will oversee its implementation and undertake regular compliance audits. The Asset Management contractor will be contractually required to comply with the EMP and the requirements of the Environmental Manager.

C. Impacts that will not be Significant

All of the remaining effects of the Gathabawn Windfarm project on Population have no likelihood of causing significant adverse effects to Local Populations or Local Economy receptors. These are listed below

Construction Phase:

Business Disruption and Loss of Revenue – Neutral Impact: No significant disruption to local businesses is expected during construction. Mitigation measures will include using the national and regional road network where practicable, maintaining access to businesses and properties, scheduling turbine deliveries during off-peak periods, limiting works on local roads to short durations, and implementing traffic management, including flagmen, where required. With these measures in place, the overall effect on local businesses is assessed as Neutral.

Tourism Revenue – Neutral Impact: The Study Area has limited tourist accommodation and mainly local recreational amenities, including the Gathabawn Loop Walk. Construction may cause temporary and localised inconvenience to visitors; however, access to recreational amenities will be maintained and managed throughout the works, with disruption kept to the minimum necessary. No material reduction in tourism activity or expenditure is anticipated, and the overall effect on tourism revenue is assessed as Neutral.

Local Economy – Positive, Imperceptible Impact: Construction will generate a short-term positive economic effect through employment and expenditure on local and regional goods and services. The approximately 12-month construction phase will employ up to 160 people, while approximately €10 million will be spent in Ireland on civil and electrical works for the Windfarm and a further €25 million on the grid connection. Local and regional sourcing of aggregates, fuel, concrete, construction materials, plant and other services will be prioritised where practicable, supporting local businesses. Overall, the positive effect on the local economy is assessed as Imperceptible.

Operational Phase

Tourism Revenue – Neutral Impact During operation, landscape and visual effects within 5 km of the Windfarm are predicted to range from Slight to Moderate, depending on proximity, viewing context and screening. However, residual visual effects at tourism, recreational and heritage receptors are assessed as Not Significant. Given the relatively limited tourism offering within the Study Area, no material reduction in visitor numbers or tourism revenue is anticipated. No specific additional mitigation is required beyond the landscape and visual mitigation incorporated into the Project design. The overall operational effect on tourism revenue is assessed as Neutral.

Commercial Rates: Slight to Imperceptible Positive Impact: During the 35-year operational phase, the Proposed Gathabawn Windfarm is estimated to generate approximately €800,000 per annum in commercial rates. This will provide a long-term positive contribution to the County budget.

Strengthening the Local Economy: Imperceptible Positive Impact: During the 35-year operational phase, the Gathabawn Windfarm will provide ongoing economic benefits through landowner payments and the Community Benefit Fund. Approximately 10 people will be employed in operation and maintenance, with annual operational expenditure of approximately €4.2 million, including approximately €12,000 on local goods and services and €50,000 on local road and electrical maintenance. Approximately €670,000 per annum will also be paid to participating landowners.

Contribution to Climate Mitigation: Imperceptible Positive Impact: The Proposed Gathabawn Windfarm will generate renewable electricity and contribute towards Ireland's national 2030 emissions-reduction and renewable energy targets. Current projections indicate a potential 25% reduction in greenhouse gas emissions by 2030, compared with the national target of 51%. Failure to achieve climate neutrality could result in national economic costs/fines of approximately €350 million per annum up to 2030, rising to approximately €700 million. Extreme weather events could cost approximately €500 million. The Windfarm will make an incremental contribution to reducing fossil-fuel dependency, improving energy security and mitigating climate-related economic costs. The overall effect is assessed as Imperceptible Positive.

D. Mitigation Measures for Population

Construction Phase – Environmental Management and Mitigation

Construction will be undertaken in accordance with an Environmental Management Plan (EMP) incorporating all construction-phase mitigation and monitoring requirements. An independent Environmental Clerk of Works (ECOW), supported by the Project Ecologist and other environmental specialists as required, will monitor compliance. Weekly EMP audits will be undertaken, corrective actions implemented where necessary, and the ECOW will have stop-works authority in the event of a significant unforeseen environmental effect.

A Traffic Management Plan, agreed in coordination with Kilkenny County Council, will manage construction traffic. Measures will include traffic control and flagmen during temporary lane closures, coordination of deliveries to avoid peak construction activities, appropriate signage, maintenance of property access along cable routes, and a road safety and courtesy protocol for construction traffic. Any construction-related damage to public roads will be repaired to at least its pre-construction condition.

A Community Liaison Officer (CLO) will keep residents informed of relevant construction schedules and provide a point of contact for issues including noise and vibration. A Landowner Liaison Officer (LLO) will coordinate with affected landowners regarding access, fencing, livestock water supplies and construction schedules.

Dust-control measures will include inspection, sweeping and watering of site and public roads where required, covering vehicles carrying potentially dusty materials, and regular cleaning of affected public roads.

Prior to turbine erection, relevant telecommunications operators will be consulted to confirm whether mitigation is required. Where necessary, appropriate measures will be implemented to maintain telecommunications services.

All works on public roads will be undertaken under the required Kilkenny County Council licences, and construction activities will be monitored throughout to ensure compliance with the EMP and specified mitigation measures.

NTS of EIAR Section 17.5 Cumulative Impact with Other Projects

Other existing and permitted projects, and projects advanced in the planning system were examined for their potential to cumulatively affect Population with the Whole Gathabawn Windfarm Project.

Cumulative Landscape and Visual Effects – 5 km: The cumulative landscape effect associated with Gathabawn, Lisdowney and the proposed Killoshulan and Seskin wind farms is assessed as Medium. However, rolling terrain, intervening vegetation and separation between developments limit combined visibility, and cumulative visual effects are assessed as Not Significant.

Cumulative Tourism Effects – 5 km: The secondary effect on tourism and recreation, including walking and cycling, is assessed as Low, as users will generally experience intermittent views while moving through the landscape. The cumulative effect on recreation within the 5 km Study Area is therefore Not Significant.

Cumulative Landscape and Visual Effects – 20 km: Beyond the central Study Area, other wind energy developments are generally more than 8 km away. This separation substantially reduces cumulative visibility, and cumulative visual effects within the wider 20 km Study Area are assessed as Not Significant.

Cumulative Tourism Effects – 20 km: Given the limited cumulative visual effects at tourism and recreational receptors in the wider area, the resulting cumulative effect on tourism within the 20 km Study Area is assessed as Not Significant.

Cumulative Community Benefit – Positive Effect: The other permitted and in-planning windfarms and solar projects within 15 km are expected to provide approximately €1.3 million per annum through Community Benefit Funds. Together with approximately €300,000 per annum from the Proposed Gathabawn Windfarm, this represents a cumulative contribution of approximately €1.6 million annually to local communities. These funds, together with commercial rates paid to the Local Authority, will support local projects, amenities and facilities, resulting in a long-term indirect positive cumulative effect on community resources and sense of place.

Operational Phase – Cumulative Climate Mitigation: Positive Effect

During the operational phase, the Proposed Gathabawn Windfarm, together with other wind and solar projects within the 5 km and wider 20 km Study Areas, will cumulatively increase renewable electricity generation, reduce carbon emissions and support energy security. These projects will contribute towards Ireland's 9 GW renewable energy target and net-zero objectives, resulting in a long-term positive cumulative effect on climate mitigation, with associated benefits for human health, wellbeing and economic systems.

NTS of EIAR Section 17.6 Summary Conclusion

Local Population: Construction of the proposed windfarm will result in temporary effects associated mainly with construction traffic and activity; with mitigation, these effects will be Not Significant. During operation, no significant adverse effects on local population or residential property values are predicted. Construction of the grid connection will result mainly in temporary traffic and roadworks effects.

Local Economy: Construction and operation of the proposed windfarm will provide positive economic effects through employment, expenditure and local purchasing. Operational benefits will include a c.€300,000 annual Community Benefit Fund, approximately €800,000 per annum in commercial rates, €670,000 in landowner payments and local expenditure.

Tourism: Construction of the proposed windfarm may cause temporary localised inconvenience to recreational users.

Overall, neither the proposed windfarm nor the grid connection is predicted to result in significant adverse effects on local population, the economy or tourism. The principal long-term positive community, economic and climate benefits will arise from operation of the proposed windfarm project.

NTS of EIAR Chapter 18 Human Health

Chapter 18 of the EIA Report Human Health has been carried out by Tara Barratt of Savills who has an MSc (DIC) in Environmental Technology and a BSc (Hons) in Geography. Tara has ten years' experience undertaking health impact assessments, including assessing population and human health within EIA, is an Associate of the Institute of Environmental Management and Assessment (IEMA), and contributing author to IEMAs guidance on "Determining Significance for Human Health in EIA" and "Effective Scoping of Human Health in EIA". The evaluations have been checked by Dr Andrew Buroni Savills, who has in excess of 26 years of health assessment.

Desktop sources for the evaluation concentrated on the CSO Statbank.

Figures of interest in the EIAR Report

- Figure 18.2 Local Residences and Community Facilities within the Air Quality, Noise and Vibration, Shadow Flicker and EMF Study Areas.
- Figure 18.3 Local Water Supplies
- Figure 18.4 Viewpoints and Local Amenities

See also Appendix

- Appendix 18.3 Explanation and Modelling of EMF

Figures and Appendices are also available on the dedicated planning website

www.gathabawnwindfarmplanning.ie

The evaluations for Human Health herein have been carried out in accordance with the *Manual on Health Impact Assessment Guidance* and the *IEMA Guide to Determining Significance for Human Health in EIA*.

NTS of EIAR Section 18.2 Sensitive Aspects of Population

The study on human health in the local environment relates to the people living in the area and their health and wellbeing. People visiting the area are also considered.

- The effects of the proposal on **Local Communities** were studied

The **study areas** for the sensitive aspects of local communities are as follows:

- EMF (Electro-magnetic Fields): Dwellings and community facilities within 100m of turbines, windfarm substation and underground cabling. At distances greater than 100m, the contribution of the project to ambient EMF levels will be extremely low or none, with effects being considered neutral or none
- Construction Dust: Dwellings, community facilities and local walking routes within:
 - 250m from construction works areas
 - 50m from public roads used by construction vehicles or delivery vehicles, for the first 250m of the public roads from the Project site exit points
- Noise emissions: Noise Sensitive Locations (houses) within 2km of a proposed turbine
- Shadow Flicker: Residences and community facilities within 1360m of a proposed turbine
- Local groundwater supplies within 300m of construction works, and surface water supplies within downstream hydrologically connected watercourses
- Climate change - Irish State

NTS of EIAR Section 18.3 Baseline Environment

Population Health and Sensitivity: The local population has a broadly similar demographic and health profile to the national population, although there are higher proportions of people aged 15 years and under and 45 years and over. Physical and mental health indicators are generally comparable to national averages, while some lifestyle indicators are more favourable. Overall, the local population is not considered more sensitive to environmental or socio-economic change than the general population of Ireland.

Existing Environmental Conditions: The Study Area is predominantly rural, with good existing air quality due to the absence of major industrial sources and busy roads. Existing noise and vibration sources include local traffic, agricultural machinery and the operational Lisdowney Windfarm Substation. The Lisdowney Windfarm also generates shadow flicker at some nearby residences. Existing sources of electromagnetic fields (EMF) include overhead electricity and telephone lines, electrical equipment and underground electricity cables associated with existing energy infrastructure.

Wellbeing – Community Resources: The local area contains a range of community, recreational and tourism amenities, including walking and cycling routes, parks, sports facilities, community halls and hospitality facilities. Most are located away from construction works.

Landscape and visual effects have been assessed within 20 km, with particular consideration of sensitive views and community amenities within 5 km of the nearest turbine. These include views from roads, settlements, scenic locations and recreational areas. The potential effects of the Proposed Windfarm on the use and enjoyment of these community resources have been considered as part of the assessment.

Wellbeing – Fears and Aspirations for the Future: Local communities are expected to value maintaining their quality of life for future generations, while climate change represents a growing concern. A 2024 EPA survey found that 81% of people in Ireland are worried about climate change, 75% consider extreme weather a moderate or high risk to their community over the next 10 years, and 79% believe climate change should be a high or very high Government priority. There is also strong support for renewable energy, with 70% recognising switching to renewable energy as an effective means of reducing carbon emissions and 74% considering climate action likely to improve quality of life in Ireland.

Climate Change and Human Health: Climate change is expected to increase health risks, including those associated with higher temperatures and extreme weather. The Proposed Gathabawn Windfarm will contribute to climate mitigation by generating approximately 150 million kWh of renewable electricity annually, sufficient for approximately 33,237 homes, and potentially offsetting approximately 38,250 tonnes of CO₂e per year.

NTS of EIAR Section 18.4 Impact of the Proposed Development

It is evaluated that there is no likelihood of the Whole Gathabawn Windfarm Project causing significant adverse effects to the Health and Wellbeing of members of the Local Community receptors or to Visitors to the Area. Summary evaluations of these evaluations are provided below.

A. Construction Impacts which will not be Significant

All effects of the Whole Gathabawn Windfarm Project on Human Health during the construction phase will be Neutral or Not Significant.

Construction Phase – Air Quality and Human Health: Construction traffic is expected to have a Negligible effect on air quality and human health. Temporary dust may arise near some residences and along walking routes, particularly during construction of the Grid Connection. Dust will be controlled through road

sweeping, covering of loads and dust monitoring. With these measures in place, the overall effect on human health and wellbeing is assessed as Negligible and Not Significant.

Construction Phase – Noise and Human Health: Construction noise and vibration from the Proposed Gathabawn Windfarm and Grid Connection will be temporary and controlled through noise limits, restricted working hours and appropriate noise-control measures. Predicted noise levels at the nearest sensitive locations will remain below the daytime construction limits. The resulting effect on human health is assessed as Negligible and Not Significant.

Construction Phase – Water Supply and Human Health: Potential effects on public water supplies and private wells during construction are assessed as Not Significant. The nearest downstream public water abstraction is approximately 3.4 km south from the Ballyring Area, and sediment and pollution-control measures will protect water quality. Potential effects on groundwater and private wells from accidental spills will also be controlled through construction mitigation measures. The resulting effect on human health and wellbeing is assessed as Neutral.

Construction Phase – Road Safety: Construction will temporarily increase traffic on local roads associated with the Gathabawn Windfarm and Grid Connection. A Road Safety Protocol and Traffic Management Plan will be implemented, together with monitoring and repair of road conditions where required. With these measures in place, effects on pedestrian and cyclist safety are assessed as Negligible, and no increased risk of road accidents is likely.

Construction Phase – Access to Walking Amenities: Gathabawn Windfarm will not overlap the Gathabawn Loop Walk. Construction of the Grid Connection may temporarily restrict access to sections of the walk for approximately 9 weeks due to road closures during cabling works. As alternative walking amenities are available and full access will be restored following construction, the effect is assessed as Negligible and Not Significant.

Major Accidents and Natural Disasters: The Whole Gathabawn Windfarm Project is not considered vulnerable to major accidents, with no nearby Seveso sites and only small quantities of potentially hazardous substances required. Vulnerability to flooding, landslides, wildfire, extreme storms and climate-related events is assessed as Extremely Unlikely due to the site conditions, drainage measures and turbine design standards. Monitoring, emergency communication and remote operational controls will also ensure that the development does not worsen the consequences of an unrelated local emergency.

B. Operational Impacts which will not be Significant

Secondary Impact of Operational Noise impacts on Health & Wellbeing: Operation of the Proposed Gathabawn Windfarm will change the local sound environment. There are 65 Noise Sensitive Locations (NSLs) within 1 km, 104 between 1 km and 1.5 km, and 105 between 1.5 km and 2 km of a proposed turbine.

Operational noise limits are designed to protect human health, including noise-sensitive receptors. Minor predicted exceedances at a small number of NSLs are immaterial and can be managed through operational controls and are not expected to result in material health effects.

Available evidence does not establish a clear or consistent association between wind turbine noise, including amplitude modulation, infrasound and low-frequency noise, and adverse human health effects. For specific concerns including tinnitus, cancer, dementia, autism and ADHD, evidence relating specifically to wind turbine noise is limited or inconclusive. Overall, based on the available evidence and predicted noise levels, the effect on human health is assessed as Not Significant.

Operational Phase – Shadow Flicker and Human Health: Before mitigation, no receptor is predicted to experience 30 hours or more of shadow flicker per year under the realistic-case scenario.

The developer commits to installing Shadow Flicker Control Modules on all turbines, irrespective of any planning condition. If a shadow flicker complaint is received from a residence within the 1360 m Shadow Flicker Study Area, the complaint will be investigated and the control module setting will be activated for the turbine(s) relevant to that residence. Activation of the setting does not itself shut down the turbine. Once activated, the module will monitor the defined parameters and automatically shut down the relevant turbine(s) when a shadow flicker event is predicted at that residence, thereby eliminating the predicted shadow flicker effect. Annual reporting on operation of the control system and compliance with any applicable planning condition will also be provided to the Local Authority following the first year of operation.

With this mitigation, the effect of shadow flicker on human health is assessed as Negligible and Not Significant.

Operational Phase – Electromagnetic Fields (EMF) and Human Health: The turbines, Windfarm Control Buildings and Parksgrove Substation will be more than 100 m from residences, community facilities and local amenities. However, sections of the underground electricity cabling between Ballylehaun and Ballyring, and Ballyring and Moatpark, will pass within 100 m of these sensitive receptors.

EMF modelling predicts a worst-case magnetic field of 12.175 μT , directly above the 110 kV underground cable, substantially below the ICNIRP public exposure guideline of 100 μT . No measurable electric field is predicted above ground because the metallic cable sheath screens the electric field, with the cables also buried beneath surrounding fill material. As EMF levels will remain substantially within public exposure guidelines established to protect human health, the effect on local population health is assessed as Negligible, resulting in an Imperceptible effect.

Operational Phase – Ice Throw: Ice forming on turbine blades could present a potential risk to landowners, walkers, windfarm personnel and the general public. Ice detection systems will be installed at the Proposed Gathabawn Windfarm to detect icing conditions, shut down affected turbines where required and prevent automatic restart during de-icing. With these ice detection and shutdown controls in place, hazardous ice throw is not likely to occur and No Likely Impact is predicted.

Operational Phase – Turbine Failure: Modern turbines incorporate independent fail-safe braking systems, blade-pitch and yaw controls, and are subject to rigorous design, testing, construction and commissioning requirements. Regular safety audits will verify that these controls remain effective during operation. With these design, fail-safe and operational safety controls in place, catastrophic turbine failure is unlikely and No Likely Impact on landowners, walkers or the general public is predicted.

Operational Phase – Landscape, Visual Effects and Community Wellbeing: Landscape effects within 5 km of the Proposed Gathabawn Windfarm are assessed as ranging from Slight to Substantial Moderate, depending on proximity, viewing angle and topography. Effects on community wellbeing are subjective, with the turbines potentially perceived negatively as large infrastructure or positively in the context of climate action.

The turbines may alter views experienced from some local community, recreational and amenity resources; however, this visual change will not prevent access to, use of, or availability of these resources. While some individuals may experience dissatisfaction with the changed landscape, the secondary effect on local population health and wellbeing is assessed as Negligible.

Operational Phase – Community Resources, Facilities and Amenities: The Proposed Gathabawn Windfarm Community Benefit Fund will be calculated on the basis of €2 per MWh of renewable electricity generated. Based on estimated annual generation of approximately 150,000 MWh, this equates to an estimated €300,000 per year. The Fund will support eligible local initiatives and direct payments to nearby households, contributing to improvements in community resources, facilities and amenities and providing long-term benefits for community wellbeing and sense of place. The project will also fund an interactive heritage

database for the local community to record and share its cultural and natural heritage. Together, these measures are assessed as having a Slight Positive effect.

Operational Phase – Renewable Energy, Air Quality and Human Health: **Operational Phase – Air Quality and Human Health:** The Proposed Gathabawn Windfarm will reduce NO_x emissions, which contribute to air pollution and can adversely affect respiratory health. As these benefits will be widely dispersed rather than concentrated locally, the effect on local population health is Not Significant Positive.

Operational Phase – Climate and Human Health: The Proposed Gathabawn Windfarm will reduce greenhouse gas emissions and make a Positive contribution to climate action. However, climate-related health benefits are distributed nationally and globally and depend on wider collective climate action, rather than directly improving local health. The secondary effect on local population health is therefore Low and Not Significant Positive, with potential additional wellbeing benefits from positive perceptions of climate action.

Decommissioning Phase – Community Health and Wellbeing: Decommissioning will last approximately six months, with lower traffic, dust and noise effects than construction, resulting in Not Significant effects on health, wellbeing and local amenities. The ending of the Community Benefit Fund may, however, reduce financial support available to local community facilities and services.

Visitor Health and Wellbeing: Visitors may experience temporary traffic, noise, dust and access disruption during construction. Part of the Gathabawn Loop Walk will close for approximately 9 weeks during Grid Connection works, with alternative walking routes available. Operational EMF exposure from underground cabling will remain substantially below public exposure guidelines. Overall, effects on visitor health and wellbeing during construction, operation and decommissioning are Not Significant.

C. Mitigation Measures – Construction Phase

Construction Environmental Management and Monitoring: Construction will be undertaken in accordance with an Environmental Management Plan (EMP) and Traffic Management Plan, with compliance monitored by an independent Environmental Management Team. Key measures include dust and noise control, defined working hours, road condition monitoring and repair, traffic and road-safety management, and regular environmental inspections. An Environmental Clerk of Works will undertake weekly audits and have authority to stop works if a significant unforeseen environmental effect occurs. A Community Liaison Officer will keep local residents informed and provide a point of contact throughout construction.

D. Mitigation Measures – Operational Phase

Operational Environmental Management and Monitoring: The Proposed Gathabawn Windfarm will operate under an updated Environmental Management Plan (EMP). The owner will retain overall responsibility for ensuring that required corrective actions are implemented, supported by a suitably qualified Environmental Manager who will oversee compliance and undertake regular audits. The Asset Management contractor will implement required operational controls and corrective measures in accordance with the EMP. Monitoring will address noise, amplitude modulation, shadow flicker and vegetation establishment, with a Community Liaison Officer acting as the local point of contact.

NTS of EIAR Section 18.5 Cumulative Effects with Other Projects

Other existing and permitted projects, and projects advanced in the planning system were examined for their potential to cumulatively affect Human Health with the Proposed Windfarm and Grid Connection. The Cumulative Study Areas which were used to identify Other Projects in the Air Quality, Noise and Vibration, Material Assets (Roads), EMF and for Local Water Supply are relevant to the Human Health cumulative evaluation. The Operational Phase cumulative impact evaluations are summarised below

A. Operational Phase Cumulative Impacts from increased noise and from shadow flicker

Cumulative Noise: Cumulative noise from the Proposed Gathabawn Windfarm and existing Lisdowney Windfarm has been assessed, with other wind farms sufficiently distant or subject to noise controls. The cumulative effect on human health is Minor Adverse and Not Significant.

Cumulative Shadow Flicker: Five sensitive receptors could exceed 30 minutes of shadow flicker in a given day, although none would exceed 30 hours per year. Shadow Flicker Control Modules will limit or eliminate shadow flicker where required. Cumulative effects on human health are Negligible and Not Significant.

B. Operational Phase Cumulative Impacts from changes to the visual environment

Cumulative Landscape and Human Health Effects: The cumulative landscape effect of the Proposed Gathabawn Windfarm and Lisdowney Windfarm is assessed as Medium, varying with proximity, viewing angle and topography.

Separately, the resulting secondary effect on local population health and wellbeing is assessed as Negligible and Not Significant. Effects on walkers and visitors are also Negligible and Not Significant.

C. Operational Phase Cumulative Impacts due to Community Benefit Funds (positive)

Cumulative Community Benefit: The Proposed Gathabawn Windfarm, together with Ballynalacken Windfarm and Parksgrove Solar Farm, will provide more than €500,000 annually in Community Benefit Funds. Together with commercial rates, these funds will support local projects, amenities and facilities, resulting in an indirect Minor Positive long-term cumulative effect on community resources and sense of place.

D. Operational Phase Cumulative Impacts due to Climate Mitigation (positive)

Cumulative Climate Mitigation and Human Health: The Proposed Gathabawn Windfarm, together with other renewable energy projects, will cumulatively increase renewable energy generation, reduce carbon emissions and support energy security. The cumulative climate effect is Significant Positive, while the associated long-term effect on human health and wellbeing is Minor Beneficial and Not Significant, reflecting the wider collective action required to achieve climate-related health benefits.

NTS of EIAR Section 18.6 Summary Conclusion

The Proposed Gathabawn Windfarm and Candidate Grid Connection will have both adverse and beneficial effects on local communities. Construction effects from traffic, noise, dust and temporary access disruption will be short-term and Not Significant with mitigation. During operation, controls for noise, shadow flicker, EMF and safety will avoid significant health effects, while landscape change may have subjective but Not Significant effects on wellbeing.

Long-term benefits will arise from the Community Benefit Fund, renewable energy generation and climate mitigation, with beneficial effects on community wellbeing. Overall, effects on **Human Health and Wellbeing**, including cumulative effects, are assessed as **Not Significant**.

NTS of EIAR Chapter 19 Vulnerability to Major Accidents, Natural Disasters and Climate Change

Vulnerability Major Accidents: Gathabawn Windfarm is not vulnerable to Major Accidents due to separation distance from the nearest Seveso site - Grassland Fertilizers on the outskirts of Kilkenny City, which is c.15km from the windfarm site.

The Windfarm project will not cause a Major Accident from the use of Dangerous Substances during construction, operation or decommissioning, because of the minimal volumes of such substances used on site.

Vulnerability to Natural Disasters: The vulnerability of Gathabawn Windfarm to extreme weather events is assessed in the EIA Report. Rising global temperatures, also observed here in Ireland, increase the risk of more extreme weather events, including extreme winds, temperatures and rainfall. Heavy rainfall increases the risk of flooding and landslide.

Climate Change Irish context in Ireland: Ireland's climate is getting warmer, which increases the risk of extreme weather. We are likely to experience more heavy rainfall, longer dry spells and stronger storms. This could lead to more flooding, water shortages, damage from high winds, and disruption to electricity, transport and other services. Warmer seas and more moisture in the air can also make storms stronger and more damaging. Overall, climate change means that extreme weather could happen more often and have greater impacts on people, homes, businesses and infrastructure (Met Éireann, 2026).

Extreme Weather – Storms It is assessed that the likelihood of the Gathabawn Windfarm Project being affected by storms is **Extremely Unlikely**. According to the Met Éireann Storm Centre, in January 2025 Storm Éowyn brought the strongest winds ever recorded in Ireland with gusts up to 184 km/h. The Beaufort Scale classes a Force 12 storm with speeds in excess 117km/h as Hurricane Force.

The wind turbines which will be installed at the Gathabawn Windfarm site will be designed to withstand at least 215km/h.

In relation to the likely grid connection, the underground cabling, electrical apparatus and equipment will not be affected by windstorms, while the type of electrical apparatus and equipment which will be installed at the substation will be designed to withstand exposure in the open countryside.

Extreme Weather – Temperature Variations: Very hot days, with temperatures above 30°C, are still uncommon in Ireland and generally occur only during the summer months. However, recent years have shown periods of unusually warm and dry weather. Spring and summer 2026 included prolonged hot weather and heatwaves, with record or near-record temperatures reported in several areas (Met Éireann, 2026).

Ireland can also experience periods of very cold weather. During the severe winters of 2009/2010 and 2010/2011, temperatures fell well below freezing, reaching as low as -16°C in County Kilkenny. Storm Emma in 2018 also brought heavy snowfall and very cold conditions.

These extreme temperatures can affect people, buildings and infrastructure. Hot weather can increase the risk of heat stress, drought and water shortages, while very cold weather and snow can cause icy conditions and interruptions to essential services.

It is assessed that the likelihood of the Gathabawn Windfarm Project being affected by temperature extremes is assessed as **Extremely Unlikely**. The Gathabawn turbines will be designed to operate within temperature ranges between -20°C and +50°C. The turbines can be fitted with a de-icing system which will thaw ice from

the blades, using fans installed inside each blade root. The type of electrical apparatus and equipment which will be installed at the substation is designed to withstand temperature variability.

Extreme Weather – Flooding and Rainfall: It is assessed that the likelihood of the Gathabawn Windfarm Project being affected by flooding or extreme rainfall events or causing flooding to occur is assessed as **Extremely Unlikely**. According to the Flood Risk Management Plan for the Nore Basin (OPW, 2018), historically the Kilkenny, Thomastown and Inistioge have experienced significant flooding issues, all of which are at substantial distances downstream of the Whole Project. Within the sub-catchments associated with the project, flooding has also occurred at Ballyragget and at Freshford.

The windfarm site is not vulnerable to flooding due to the elevated nature of the location and the minimal amount of water on the site. The windfarm drainage system will be installed at the beginning of the construction phase and remain in place and will be regularly maintained for the operational lifetime of the windfarm. The grid connection Parksgrove Substation is not located within any mapped flood area, and due to the use of aggregate within the compound and the underground nature of the cabling, it is considered that the Grid Connection works will not cause flooding to occur.

Natural Disaster – Landslide: Ireland's location, terrain and climate result in landslides occurring mainly in areas with steep slopes where rock meets the surface and peat covers the terrain. It is assessed that the likelihood of the Gathabawn Windfarm being affected by landslip is **Extremely Unlikely**.

Site visits and trial hole investigations at the windfarm site found no peat on-site. An examination of the GSI Landslide Susceptibility Mapping found that the majority of the turbines and windfarm site roads are located in locally flat areas, with Low GSI landslide susceptibility. No turbines are located within a High Risk Area.

GSI mapping identifies one area at Ballylehaun as having a high susceptibility to landslides. However, this mapping provides a general indication of where landslides could potentially occur and does not mean that a landslide is expected at this location. A more detailed, site-specific assessment of the ground conditions was carried out as part of the Geotechnical Stability Report. This assessment concluded that landslides are not expected to occur within the windfarm site, including the area identified by the mapping in Ballylehaun. In addition, no wind farm infrastructure is proposed within this area as it will form part of a Biodiversity Area, where the existing native woodland will be protected and maintained and additional trees and shrubs will be planted.

Most of the grid connection is within areas of low landslide risk. A short 30 m section of underground cable passes through an area of high risk. The cable trench will be backfilled with the excavated material and the ground reinstated to its original slopes and levels. With these measures in place, the geotechnical assessment concluded that the works are **Very Unlikely** to cause a landslide.

The expected consequences arising from extreme weather, flooding or landslip in relation to human health and the local environment, should the event occur have been assessed in the EIA Report. Due to the low number of personnel working on-site at any one location and the relatively low number of people living or working locally, the consequences of extreme weather, flooding or land slippage, if they did occur, is considered to be **Minor**. Due to the potential for simple contamination and localised effects of short duration in downstream watercourses during construction, the consequences to water quality due to land slippage or flooding, is considered to be **Limited**.

Mitigation Measures to avoid/reduce Vulnerability to Natural Disasters: The wind farm and grid connection have been designed to reduce risks from extreme weather, flooding and landslides.

Mitigation by Design: Windfarm: Compliance of the wind turbines with the latest IEC 61400 standard; Location of the wind turbines, windfarm site roads and control buildings away from flood extents; Undergrounding of windfarm electricity cables; Turbine foundations constructed on bedrock or other

competent material, overlain with and surrounded by a hardstanding area; Design of construction areas to ensure cut and fill slopes are appropriate; absence of watercourses in the windfarm area; absence of peat; windfarm drainage network; excavations not used in backfilling at the roads and foundation areas will be used to backfill the borrow pits.

Likely Grid Connection works: Timing of instream works and directional drilling works at the River Nore to occur during the months of July, August or September, and during a period of low flood risk; cables are underground; proposed Parksgrove Substation location outside of a floodplain.

Mitigation by Management: Construction Environmental Management Plan; Sediment & Erosion / Storm Water Control Plan; Environmental Manager; Project Ecologist; Ground Stability Measures; Management of excavated material; Runoff and Sediment Control, Windfarm Drainage System; Monitoring of Silt Fencing & Drainage Structures; Weather monitoring and Emergency Response Procedures.

Emergency Response Procedures are included in the Environmental Management Plan (EMP). Environmental Awareness Training will be provided to ensure that the appointed Contractors site personnel, are aware of the relevant Environmental Commitments and Environmental Protection Measures and that site personnel are aware of the steps to take in an environmental emergency.

If an unrelated disaster occurs in the locality, monitoring, drainage, weather forecasting, stakeholder communication and remote control systems will help ensure that the windfarm and grid connection do not make the effects of the event worse.

NTS of EIAR Chapter 20 Mitigation and Monitoring Measures

A summary of the mitigation measures which are envisaged to avoid, prevent, reduce or offset adverse effects of the Gathabawn Windfarm Project on the environment are set out in Chapter 20 of the EIA Report.

Mitigation

The primary mitigation for the Gathabawn Windfarm Project is mitigation by **avoidance** i.e. the design of the windfarm through the consideration of alternative locations, layouts, size and scale (as set out in EIAR Chapter 4: Alternatives Considered).

Then, for effects that cannot be avoided through consideration of alternatives, mitigation by **prevention, reduction or offsetting** is proposed. The mitigation measures where required for effects or as best practice, are detailed in the various topic chapters. The expected effectiveness of the mitigation measures is also provided within each topic chapter. The whole Gathabawn Windfarm Project Mitigation Measures are collated in EIA Report Chapter 20.

Monitoring

Monitoring is also proposed for all stages of the development – Construction, Operation and Decommissioning, to check that the proposed mitigation measures are operating as intended and that the project, in practice conforms to the predictions made during the EIA process.

The monitoring process will include recording of any unforeseen effects or non-compliance with mitigation measures/ planning consent conditions and appropriate remedial action will be taken.

Mitigation measures and monitoring arrangements are summarised in each of the topic chapters above.

NTS of EIAR Chapter 21 Interaction of the Foregoing

Each of the competent experts has considered the potential for effects passed on from other environmental topic to the environmental topic they studied. **For example:** the potential for effects to Soils (excavation of soils) to have a secondary effect to Climate (release of embodied emissions from bare and exposed soil). This is an example of an impact INTERACTION.

The **interactions** between the potential effects on a topic such as Water and another environmental topic, for example Land, is what is considered in Chapter 18 of the EIA Report.

The following show a **sample of the interactions** examined, and are presented in order of the **Primary Environmental Factor**, Sensitive Aspect, then the **> Receiving Environmental Factor**, Sensitive Aspect:

- **Land:** Agricultural Land -> **Biodiversity:** Terrestrial Habitats; Fauna.
- **Soils:** Local Soils & Subsoils - > **Land:** Agricultural Land
- **Soils:** Local Soils & Subsoils - > **Water:** River Waterbodies, Groundwater Bodies, Water Supply (Local Wells), Designated Sites
- **Soils:** Local Soils & Subsoils - > **Air Quality:** Local Residents, Communities, Amenities
- **Soils:** Local Soils & Subsoils - > **Climate:** Climate Change
- **Water:** River Waterbodies, Groundwater Bodies - > **Land:** Agricultural Land
- **Water:** Water Supply - > **Land:** Agricultural Land
- **Water:** River Waterbodies, Groundwater Bodies - > **Soils Local Soils & Bedrock**
- **Water:** River Waterbodies, Groundwater Bodies - > **Biodiversity:** Terrestrial Habitats; Amphibians & Reptiles; Mammals (Otter); Birds – Waders and Waterbirds; Aquatic Habitats & Species Designated Sites
- **Water:** Water Supply -> **Human Health:** Health & Wellbeing
- **Air Quality:** Dust -> **Land:** Agricultural Land
- **Air Quality:** Dust -> **Human Health:** Local Community Health & Wellbeing
- **Noise & Vibration** Construction & Operation - > **Biodiversity:** Fauna, Bats, Birds Disturbance/displacement
- **Noise & Vibration** Operation - > **Human Health:** Local Community Health & Wellbeing
- **Shadow Flicker** Operation - > **Human Health:** Local Community Health & Wellbeing
- **Climate:** Climate Change - > **Land, Soils, Water, Air Quality, Biodiversity, Material Assets, Population and Human Health (multiple interactions)**
- **Climate:** Climate Action - > **Human Health** Local Community Health & Wellbeing
- **Biodiversity** Terrestrial Habitats - > **Land:** Agricultural Land (invasive species)
- **The Landscape** Visual Impact Tourism etc. - > **Population:** Local Populations & Local Economy
- **The Landscape** Visual Impact - > **Human Health:** Local Community Health & Wellbeing
- **Cultural Heritage** Visual Impact - > **Population:** Local Populations & Local Economy

Overall, some of the environmental effects of the windfarm are connected. For example, a change in one part of the environment may also affect another. These interactions have been carefully considered, and no additional significant effects are expected during construction, operation or decommissioning.

The wind farm will also have positive effects by generating renewable electricity and helping Ireland meet its renewable energy and climate goals.