

Gathabawn Windfarm Project

Environmental Impact Assessment Report

Chapter 9: Air Quality



September 2026

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CHAPTER 9 AIR QUALITY

EIAR 9.1 INTRODUCTION

In this EIAR Chapter 9 Air Quality relates to air quality, and in particular relates to levels of dust and other air pollutants such as nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}).

EIAR 9.1.1 Competent Expert

The Air Quality evaluation was carried out by Ciara Nolan, MSc in Applied Environmental Science and BSc (Hons) in Energy Systems Engineering, of AWN Consulting, a Trinity Consultants company. AWN Consulting is a multidisciplinary environmental consultancy. Ciara is a Member of the Institute of Air Quality Management (MIAQM) and Institute of Environmental Sciences (MIEnvSc). She has 10 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical, windfarm and data centres.

EIAR 9.1.2 Sources of Information

In order to gather information on the baseline environment, the following sources were considered:

Table 9-1: Sources of Baseline Information for Air

Consultation Sources
No feedback relevant to Air was received from Prescribed Bodies consulted in August 2025
Desktop Sources
• Annual air quality monitoring reports from the EPA, 2020-2024 • Review of aerial photography, and OSI and other online mapping to identify sensitive receptors, including, local residential properties, local community facilities, schools, hospitals, amenity areas, workplaces, in close proximity to the proposed development; • Review of Chapter 5: Description of the Development
Fieldwork Sources
The desktop sources listed above were considered sufficient to identify the baseline air quality environment and sensitive receptors in the area.

EIAR 9.1.3 Methodology Used

The evaluation for air quality and dust impacts herein 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)*.

These methodologies and standards have been used to screen the requirement for a local air quality assessment, and to determine the importance and sensitivity of receptors, and the magnitude and significance of potential impacts. The methodologies and standards can be found in full in [Appendix 9.1: Methodology for the evaluation of Air Quality](#). The author's extensive experience with EIA preparation and

air quality management also informs this report. A list of guidelines and legislation which were taken into account during the evaluation of this chapter is also included in [Appendix. 9.1.](#)

ElAR 9.1.4 Statement on Certainty and Sufficiency of Information Provided

A clear documentary trail is provided throughout this chapter and chapter appendix to the competency of data and methods used and the rationale for selection of same.

The information used to compile this chapter is collated from data and documents generated by public bodies and statutory agencies and from previous evaluations carried out for the Gathabawn Windfarm project.

In addition, the information used to compile the baseline and impact evaluation sections of this chapter is collated from reports and documents generated by local authorities and statutory agencies, including the Environmental Protection Agency, Transport Infrastructure Ireland and the UK Institute of Air Quality Management. The most recent publications have been relied upon, with references detailed as footnotes throughout the chapter. The UK guidance has been used in the absence of equivalent Irish guidance as is considered best practice. The most recent monitoring data provided by the EPA was used to inform the baseline conditions.

No material limitations or difficulties were encountered during the course of the studies carried out to inform the assessment of impacts of the proposed Gathabawn Windfarm project on Air Quality.

ElAR 9.1.5 Development being Considered

The subject development – the **Proposed Gathabawn Windfarm**, comprises 12 wind turbines and all associated foundations and hard-standing areas in respect of each turbine, 2 control buildings, 7.7km of access roads, 1 met mast and 1 LiDAR unit for measuring meteorological conditions, underground cabling between the turbines and control buildings, 7 site entrances, newly created Biodiversity Areas and all ancillary associated and facilitating works and activities. 7 turbines and 1 control building are proposed in the Ballylehaun Area, and 5 turbines and 1 control building are proposed in the Ballyring Area.

The overall whole Gathabawn Windfarm Project also includes a connection to the national electricity grid, which is not part of the currently proposed development. While the ultimate grid connection point is subject to a separate process with Eirgrid, a candidate route has been identified to the closest node at Eirgrid Ballyragget Substation. This **Candidate Gathabawn Grid Connection** comprises a new substation in Parksgrove (Parksgrove Substation) and three distinct underground cable (UGC) sections: Ballylehaun-Ballyring UGC, Ballyring-Parksgrove UGC, and Parksgrove-Moatpark UGC.

To facilitate the evaluation of the whole project, this candidate grid connection is included in the baseline descriptions and considered within the impact evaluations detailed below.

ElAR 9.2 SENSITIVE ASPECTS

ElAR 9.2.1 Overview of Air in the Local Environment

In general terms the Gathabawn Windfarm project is located in a predominantly rural area and away from major urban areas or large centres of population. The surrounding landscape is predominantly rural, agricultural grassland. Nearby settlements include Gathabawn village, Lisdowney village and further away, Cullahill village, Freshford village and Johnstown village. Outside of these areas, the area is sparsely populated, individual residential dwellings are located at farmsteads and in ribbon style development along the local road networks.

Ireland in general has a good standard of air quality compared with other European countries. A review of air quality monitoring data from the EPA for representative areas similar to that of the proposed development indicates that there is likely a good level of air quality in the area, as it is located away from busy, congested roads and industrial sources of air pollutants.

There are a number of designated ecological sites within the area also. These include the Cullahill Mountain SAC, Spahill and Clomantagh Hill SAC, River Barrow and River Nore SAC, River Nore SPA, Cullahill Mountain pNHA and Spahill and Clomantagh Hill pNHA.

In relation to the proposed development, emissions of dust to air can arise as a result of land clearing and earth moving. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. The movement of plant, machinery and road vehicles moving over temporary roads and open ground can be a main source of dust, and if mud carried out from the construction site (trackout from vehicles) onto local roads, dust emissions can occur at some distance from the originating site. Dust emission and deposition due to earthworks, construction and trackout has the potential to affect sensitive receptors such as residential dwellings and ecological habitats and plant communities.

The pollutants of most concern in relation to the proposed development are NO₂, PM₁₀ and PM_{2.5}. These pollutants are emitted from vehicles; PM₁₀ and PM_{2.5} are also emitted as part of construction dusts.

It is noted that the Gathabawn Windfarm Project contains no sources of odour emissions to air.

ElAR 9.2.2 IAQM Guideline definition of Sensitive Receptors

There are several types of sensitive receptors in relation to Air Quality provided by both the IAQM and TII.

The IAQM guidelines define two types of sensitive receptors in relation to dust impacts – Human receptors and Ecological receptors. *“Human receptors include locations where people spend time and where property may be impacted by dust, while Ecological receptors are sensitive designated habitats that might be sensitive to dust”.*

The TII guidelines Air Quality Assessment Technical Document PE-ENV-01106 identifies the types of receptors which may be sensitive to vehicular emissions:

Table 9-2: TII Sensitive Receptors

TII Sensitive Receptors (PE-ENV-01106)	
Human Receptors	Sensitive Designated Habitats
Residential Properties	Ramsar Sites
Gardens of residential properties	Special Protected Areas (SPA) and proposed sites (pSPA)
Hospitals	Special Areas of Conservation (SAC) and proposed sites (pSAC)
Schools	Nature Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA)
Care Homes	Ancient woodland
Hotels and B&Bs	Veteran trees
Place of Worship	Nature Reserves
Sports Centres	National Parks
Shopping Areas	Refuge for Fauna and Flora
Playing Fields	Wildfowl Sanctuaries
Cyclists	Biogenetic Reserves
Outdoor locations including: car parks, bus stations and railway stations	UNESCO Biosphere Reserves
Additional Receptors included by the Author	

TII Sensitive Receptors (PE-ENV-01106)	
Human Receptors	Sensitive Designated Habitats
<i>Walkers on local walking trails</i>	<i>Wetlands identified in the Kilkenny City & County Development Plan</i>

EIAR 9.2.3 Zone of Influence/Study Areas Scoping

The area or zone of influence around the Gathabawn Windfarm project within which the impacts of the development could occur to sensitive aspects is called the Study Area herein. The Study Areas for the Sensitive Aspects of the Air environment are set out in the table below and illustrated on **Figure 9.1: Construction Dust - Human Receptors** and **Figure 9.2: Construction Dust - Ecological Receptors**.

Table 9-3: Study Area in relation to sensitive aspects of the Air environment

Sensitive Aspect	Zone of Influence/Study Area	Justification for the Study Area extent
Human Receptors - dust	Human receptors within: • 250m from the boundary of the works; • 50m of the routes used by construction vehicles or delivery vehicles on the public road for the first 250m of the public road from the Project site exit points.	Based on the IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction Activities'.
Human Receptors – vehicular emissions	Selected representative sensitive human receptors, located within 200m of the Affected Road Network* (ARN). * See Section 9.2.3.1 below	Based on the Transport Infrastructure Ireland (TII) guidance document 'PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document'.
Ecological Receptors - dust	• 50 m of the boundary of the works – • 50m of the routes used by construction vehicles or delivery vehicles on the public road for the first 250m of the public road from the Project site entrance.	Based on the IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction Activities'.
Designated Habitats – vehicular emissions	All sensitive designated habitats (as described in EIAR 9.2.2 above) within 200m of the Affected Road Network* (ARN) * See Section 9.2.3.1 below	Based on the Transport Infrastructure Ireland (TII) guidance document 'PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document'.

EIAR 9.2.3.1 Screening the Traffic Data for a detailed assessment of traffic emissions – TII guidance

The TII Overarching Technical Document for air quality assessments PE-ENV-01106 sets out the screening criteria for traffic emissions:

“The traffic data should be screened to establish if traffic changes are expected due to a proposed scheme and if these changes may affect air quality. The screening is done using the following criteria to determine the affected road network (ARN). The criteria are based on the changes between the Do-Something (DS) traffic compared to the Do-Minimum (DM) traffic in the year of opening:

- Road alignment will change by 5 meters (m) or more; or
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT or more; or
- Daily average speed change by 10 kph or more; or
- Peak hour speed will change by 20 kph or more.

The above criteria should be applied to the traffic study area (TSA) only. A statement should be included in the AQA detailing how the study area was defined and that the TSA is appropriate for the AQA."

In relation to the Gathabawn Windfarm Project:

- The Do-Minimum traffic is the baseline traffic volumes without the addition of the construction related traffic.
- The Do-Something traffic is the peak construction traffic volumes.
- The affected road network is the delivery haul routes including the local roads L58141, L1803, L1804, L1806, L1807, L5818, L5820, L5821 and L18062.

As detailed in [Section A9.1.2.2 of Appendix 9.1](#), the proposed development will not result in a change to road alignments, the daily traffic will be substantially below the criteria of a change of 1000 Annual Average Daily Traffic volumes, and the movement of trucks will also be substantially below 200 HGV/day (as per Ch.16 Material Assets, the peak HGV traffic is associated with pouring each of the 12 turbine foundations which will each require c.50 loads of concrete (i.e. 100 movements two-way). HGV traffic levels will be much less during all other construction periods. In addition, there will be no change in average speeds and no change in peak hour traffic speed.

During the operational phase, there will be vehicles accessing the site infrequently for maintenance purposes. These will be low in number and will not cause a noticeable change in the local traffic, while the change in traffic during the decommissioning phase will be less than for the construction phase and the changes will be below the scoping criteria.

Therefore, in accordance with the TII guidance document PE-ENV-01106, (2022), **the screening criteria to require a local Air Quality Assessment is not met for the affected road network (i.e. the roads along haulage routes), and therefore a local air quality assessment of traffic emissions is not required,** and as a result it is evaluated that there is no potential for significant impacts to human receptors or ecological receptors (including designated sites and wetlands of biodiversity importance) as a result of traffic emissions.

EIAR 9.3 BASELINE ENVIRONMENT

The context and characteristics of the baseline environment, and the trends and evolution thereof, in relation to *Local Residents & Local Community* are described in the subsections below.

The results of desktop surveys are summarised in the sections below, illustrated on the mapping listed below, with the detailed data included in the Appendix listed:

EIAR Figures (included at the end of this Chapter):

Figure 9.1: Construction Dust - Human Receptors

Figure 9.2: Construction Dust - Ecological Receptors

EIAR 9.3.1 Context and Characteristics

EIAR 9.3.1.1 Baseline Air Quality

As part of the implementation of the EU Framework Directive on Air Quality (1996/62/EC), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2025). In terms of air monitoring and assessment, the proposed development site is within Zone D, which represents rural Ireland (EPA, 2025).

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The long-term monitoring data from the EPA has been used to determine background concentrations for the key pollutants in the region of the proposed development.

Long term monitoring of Particulate Matter is relevant to the consideration of dust emissions from the proposed windfarm development. Particulate Matter monitoring data from representative rural background Zone D monitoring stations has been reviewed. The following stations are representative of the proposed development location: Claremorris Co. Mayo, Kilkitt County Monaghan and Askeaton County Limerick. The results of the long term monitoring at these locations (over a 5 year period between 2020 and 2024) is set out below:

- PM₁₀ levels measured at Kilkitt, Claremorris and Askeaton ranged from 7 to 10 µg/m³;
- PM_{2.5} levels measured at Claremorris and Askeaton ranged from 4 to 8 µg/m³

Based on the 5-year average concentration from the representative Zone D monitoring sites, a background PM₁₀ concentration of 8 µg/m³ and a background PM_{2.5} concentration of 6 µg/m³ have been used in this assessment.

EIAR 9.3.1.2 Air Quality Pollutant Limit Values

Air quality limit values for various pollutants are set out in Directive (EU) 2024/2881. This Directive supersedes the previous air quality Directive 2008/50/EC. Annex I of Directive (EU) 2024/2881 sets out the applicable air quality limit values for various pollutants, including PM₁₀ and PM_{2.5}. Table 2 of Annex I in Directive (EU) 2024/2881 details the limit values applicable for the purposes of this assessment in relation to PM₁₀ and PM_{2.5}. Directive (EU) 2024/2881 sets an annual average limit value of 40 µg/m³ for PM₁₀ and daily average limit of 50 µg/m³ for PM₁₀. An annual average limit value of 25 µg/m³ is set for PM_{2.5}. Table 1 in Annex I of Directive (EU) 2024/2881 establishes stricter air quality limit values, to be achieved by 2030, including a PM₁₀ annual limit of 20 µg/m³ and a PM_{2.5} annual limit of 10 µg/m³. Overall, it is predicted that current background Particulate Matter concentrations at the windfarm site location are generally well below the pre-2030 and post-2030 limit values set out in Directive (EU) 2024/2881.

EIAR 9.3.1.3 Location of Sensitive Receptors within the study area**EIAR 9.3.1.3.1 Human Receptors**

The area of the proposed development is characterized as rural open countryside. 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. The villages of Gathabawn, Cullahill, and Lisdowney are located 1km, 3km north, south and west of the site respectively.

Proposed Gathabawn Windfarm:

Haul Routes – General Construction Haulage: Both sections of the windfarm site will be accessed from the local public road network. For the Ballylehaun Section, access to the windfarm site will be from the L58141 road at Coolnacrutta and Glashare. For the Ballyring Section of the windfarm site, access for general construction traffic will use the local roads from the N77 at Parksgrove, then the L1807 through Lisdowney village and then along the L1806 to the site entrance at Ballyring, and then access to turbines from the L18062.

Haul Routes – Turbine Delivery: Along the turbine delivery haul route, access to the Ballylehaun site will be from the national/regional road network turning onto the L58141 as described above. Turbines for the Ballyring Section will be delivered through the Ballylehaun Section, exiting the Ballylehaun site onto the L1803 at Gorteenamuck, and then following the L1804 and onto the L1806 to the site entrance at Ballyring Upper. Facilitating works which involve the construction of a temporary road (FW8) and the temporary widening of the public road (FW9) are proposed along this route.

Candidate Gathabawn Grid Connection:

Ballylehaun – Ballyring Underground Cabling: Underground cabling is proposed between the Ballylehaun and Ballyring sections. This cabling is predominantly along local public roads (L5818, L5820, L1806 and L18062).

Ballyring – Parksgrove Underground Cabling: The underground cabling between the windfarm at Ballyring Section and the windfarm substation at Parksgrove will be mainly routed through agricultural land. Works in proximity to houses is mainly limited to road crossing locations.

Parksgrove – Moatpark Underground Cabling: The underground cabling will be mainly routed through agricultural grassland, with a short section along the R432 regional road.

Residential properties (including gardens) within the Study Area for PM₁₀ and PM_{2.5} particulate matter (i.e. dust effects) are outlined in the table below, and illustrated on **Figure 9.1: Construction Dust - Human Receptors**.

Table 9-4: Human Receptors within the Study Areas

Element	Study Area (No. of human receptors)
	Within 250m of the wind farm works/cabling works
Proposed Gathabawn Windfarm	
Wind turbine foundation & hardstanding areas	0
Borrow Pits	0
Facilitating Works FW5, FW6, FW10, FW11, FW12	0
Other windfarm construction works (Met Mast, LiDAR unit, temporary construction compounds, temporary blade set-down area)	0
Windfarm site roads	5
Facilitating Works FW1, FW2	5
Facilitating Works FW3, FW4	2
FW7	3
FW8	7

Element	Study Area (No. of human receptors)
	Within 250m of the wind farm works/cabling works
Proposed Gathabawn Windfarm	
FW9	1
Other windfarm works- hedgerow planting	2
Candidate Gathabawn Grid Connection	
Ballylehaun-Ballyring Underground Cabling works*	17
Ballyring-Parksgrove Underground Cabling works	26
Parksgrove-Moatpark Underground Cabling works	9
Parksgrove Substation	0

*3.5km of the Gathabawn Loop Walk overlaps the route of the Ballylehaun-Ballyring Underground Cabling.

Element	Relevant Public Roads	Study Area (No. of human receptors)
		Within 50m of roads, for first 250m of site exit points
Site Entrances No.1 & No.2	L58141	2
Site Entrance No.4	L5818	0
Site Entrance No.5, No.6 & No.7	L18062	0
Site Entrance No.8	N77	3
	L1807	0
Temporary Site Entrances at the Candidate Gathabawn Grid Connection	L1808	6
	L1811	2

There are no hospitals, schools, care homes, hotels or B&Bs, or areas where the public would be present for prolonged periods within the Study Area.

EIAR 9.3.1.3.2 Ecological Receptors

The occurrence of ecological receptors within the Study Area is examined in the table below and illustrated on **Figure 9.2: Construction Dust - Ecological receptors**.

Ecological Receptor Type	Within 50m of the boundary of the site	With 50m of roads, for first 250m of site exit points
Ramsar Sites	n/a	n/a
Special Protected Areas (SPA) and proposed sites (pSPA)	River Nore SPA	River Nore SPA
Special Areas of Conservation (SAC) and proposed sites (pSAC)	Cullahill Mountain SAC River Barrow & River Nore SAC River Nore SPA	Cullahill Mountain SAC River Barrow & River Nore SAC River Nore SPA
Nature Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA)	Cullahill Mountain pNHA River Nore/Abbeyleix Woods Complex pNHA	Cullahill Mountain pNHA River Nore/Abbeyleix Woods Complex pNHA
Ancient woodland	n/a	n/a
Veteran trees	At Ballylehaun Section	n/a
Nature Reserves	Gales Hill Nature Reserve	n/a
National Parks	n/a	n/a
Refuge for Fauna and Flora	Hazel wood at Ballylehaun	n/a
Wildfowl Sanctuaries	n/a	n/a

Ecological Receptor Type	Within 50m of the boundary of the site	With 50m of roads, for first 250m of site exit points
Biogenetic Reserves	n/a	n/a
UNESCO Biosphere Reserves	n/a	n/a
<i>Wetlands of Biodiversity Importance, as identified in the Kilkenny City & County Development Plan</i>	n/a.	n/a

Designated Sites: Cullahill Mountain SAC and pNHA and the Gales Hill Nature Reserve (all of which overlap each other to a large extent) are located adjacent (5m separation) to the north of the Ballylehaun Section of the windfarm. The SAC protects an orchid-rich calcareous grassland, while the pNHA and the Nature Reserve extend beyond the SAC boundary to protect an area of broadleaved woodland.

The SPA, SAC and pNHA designations associated with the River Nore occur within 50m of the Parksgrove Substation works, and within 50m of the Parksgrove-Moatpark Underground Cabling works. These designations protect habitats including watercourses, alluvial forests, floating river vegetation, wet grassland and riparian vegetation, river bank nesting burrows and hunting channels (for Kingfisher), ancient broadleaved oak woodlands, and species such as the Freshwater Nore Mussel, Otter, Atlantic Salmon, Lamprey species, Twaite Shad, White Clayed Crayfish and the Desmoulin's Whorl Snail.

Non-Designated Sites: Veteran trees occur as single isolated trees on part of the Ballylehaun Section, and a mixed native woodland occurs to the southwest of the Ballylehaun Section. This mixed native woodland forms part of the Biodiversity Enhancement & Protection Area associated with the proposed windfarm.

ElAR 9.3.2 Existing Sources of Impacts

The existing sources of particulate matter in the area of the windfarm site are primarily natural sources and to a lesser extent sources from human activities, such as road traffic emissions or burning of solid fuels for home heating, further away from the site.

ElAR 9.3.3 Importance, Sensitivity and Vulnerability to Change

Human Receptors:

In general, there is a reasonable expectation for a good quality of air in these rural, upland areas which are remote from busy, congested roads and industrial sources of air pollutants. In relation to air quality, the importance of good air quality for local residents and members of the local community is **high** importance.

Local residents and people using community facilities could be sensitive to health effects such as respiratory illnesses as a result of breathing polluted air. All local residences and community facilities are considered 'high-sensitivity' locations (see [Table 3 in Appendix 9.1](#)). Construction dust impacts are the primary potential impacts from the proposed development. Dust emissions will be short-term in nature and have the potential to impact sensitive receptors, such as residential properties within 250m of the works area. Once construction works cease, the air quality in the area will return to baseline conditions.

The area of the proposed development has been assessed as having a **medium sensitivity to dust soiling** impacts and a **low sensitivity to dust related human health impacts** (as per [Section A9.1.2.5 and Table 4 and Table 5, all found in Appendix 9.1](#)).

Using the IAQM Guidance criteria the following Sensitivity rating is applied in relation to dust soiling and potential dust-related human health impacts:

- **Dust soiling: medium sensitivity**, there are 4 no. residential properties (including gardens) within 20m of the proposed development construction works boundary for the proposed windfarm. There is 1 no. residential property within 20m of facilitating works FW8. There are 13 no. residential properties (including gardens) within 20m of the candidate grid connection construction works area. The local community using local roads as a walking amenity will be transient in nature and will not be exposed for prolonged periods, therefore, they are not included within the sensitivity assessment rating.
- **Dust-related human health impacts: low sensitivity**, there are 4 no. residential properties (including gardens) within 20m of the proposed development construction works boundary for the proposed windfarm. There is 1 no. residential property within 20m of FW8. There are 13 no. residential properties (including gardens) within 20m of the candidate grid connection construction works area. The local community using local roads as a walking amenity will be transient in nature and will not be exposed for prolonged periods, therefore, they are not included within the sensitivity assessment rating. The estimated PM₁₀ concentration in the region of the proposed development is 8 µg/m³.

Ecological Receptors:

Dust emissions have the potential to impact sensitive ecology. Dust can affect vegetation through chemical means such as chemical changes like increased acidity in soils or watercourses. Physical effects include reduced photosynthesis, respiration and transpiration through smothering. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease. High sensitivity ecological receptors are those with international or national designation (SPAs, SACs, NHAs) and where the designated feature is dust-sensitive. The sensitivity ratings are based on the IAQM guidance as per [Section A9.1.2.5](#) and [Table 6 in Appendix 9.1](#).

The Cullahill Mountain SAC and River Barrow and River Nore SAC are Natura 2000 designated ecological sites within 20m of the proposed development construction works boundary. These are considered high sensitivity receptors due to their European Designation.

Proposed NHAs (pNHAs) are medium sensitivity receptors as they do not have official designation but may have certain dust-sensitive species present. Veteran trees and local nature reserves are considered low sensitivity receptors according to the IAQM criteria.

- **Dust-related ecological impacts: high sensitivity**, sections of the Cullahill Mountain SAC and River Barrow and River Nore SAC are within 20m of the proposed development construction works boundary.

EIAR 9.3.4 Evolution of the Baseline Environment (the 'Do-Nothing' scenario)

In Ireland the primary sources of Particulate Matter (PM₁₀ and PM_{2.5}) are vehicular emissions and burning of solid fuels for heating. There are no specific future trends, although air quality is likely to improve in future years due to government and international policies on Climate Action with the replacement of diesel and petrol vehicles with electric vehicles; and replacement of fossil fuel and solid fuel heating systems with electrical heating, increasingly generated by renewable sources like wind and solar.

Due to the nature of the area (lightly populated with no congested roads) PM emissions are unlikely to change dramatically in future years. Small fluctuations are likely in line with previous trends. The baseline levels of dust including PM₁₀ and PM_{2.5} are likely to remain at existing levels by the time the windfarm commences construction.

EIAR 9.3.4.1 Relevance of Climate Change to Air

Warmer temperatures from climate change accelerate chemical reactions in the atmosphere, which speeds up the creation of ground-level ozone and other air pollutants.

Climate change's impact on precipitation patterns can lead to alterations in the frequency and intensity of rainfall events, with increased precipitation helping to remove air pollutants through wet deposition. Conversely, extended dry periods can result in reduced pollutant removal and increased concentrations of air pollutants.

The increasing frequency and severity of wildfires due to climate change is a significant air pollution source. Wildfires emit large amounts of PM, along with gases like carbon monoxide and NO_x (Chang *et al.* 2023).

EIAR 9.4 IMPACT OF THE PROPOSED DEVELOPMENT

This Section comprises an evaluation of the impacts of the Proposed Gathabawn Windfarm project on the receiving Air environment.

EIAR 9.4.1 Criteria and Methodology

The criteria used for impact evaluation in this report is based on *Environmental Impact Assessment of Projects: Guidance on the preparation of Environmental Impact Assessment Report* (EU, 2017) and *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EIAR) (EPA, 2022) and the Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction*.

The criteria used to evaluate the sensitivity of human and ecological receptors, the magnitude of impacts and the resultant significance of likely or potential effects is based on compliance with the ambient air quality limit values set out in Directive (EU) 2024/2881, and the assessment criteria in the Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction*. The methodology for determining the risk of dust impacts is based on the sensitivity of the area and the magnitude of the dust generating activity, as outlined in [Appendix 9.1](#).

EIAR 9.4.2 Source-Pathway-Receptor

The following sources of impacts and pathways for these impacts to the identified receptors (sensitive aspects) of Air, are listed below:

EIAR 9.4.2.1 Sources of Particulate Matter (dust)

Construction State	Operational Stage	Decommissioning
Earthmoving		Earthworks
Excavation and relocation of soils		Relocation of soils
Rock breaking		
Storage of overburden		
Soil erosion		
Working plant and moving machinery	Working machinery	Working machinery
Movement of vehicles and traffic	Movement of vehicles and traffic	Movement of vehicles and traffic
Increase in traffic volumes		

EIAR 9.4.2.2 Sources of vehicle/traffic related pollutants

Construction State	Operational Stage	Decommissioning
Delivery/worker traffic	Delivery/worker traffic	Delivery/worker traffic
Machinery/Vehicles run on hydrocarbons	Machinery/Vehicles run on hydrocarbons	Machinery/Vehicles run on hydrocarbons

EIAR 9.4.2.3 Pathways

- Air, Wind

EIAR 9.4.2.4 Receptors

- Human receptors (Local Residents, Residences and Gardens, walkers)
- Designated Sites (SAC, SPA, pNHA, Nature Reserve, Veteran Trees, Flora and Fauna Refuges)

EIAR 9.4.3 Overview of the impacts to Air Quality

A summary of the findings of the evaluation of the effects of the proposed Gathabawn Windfarm project on Air is listed in the table below. The relevant phases of the development are the construction, operational and decommissioning phases which are denoted by C, O and D respectively.

The evaluations follow this summary table.

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

Table 9-5: List of effects to Air Quality evaluated in detail

HUMAN RECEPTORS	<i>EIAR Section</i>
Increase in airborne dust (C)	<i>EIAR 9.4.4.1</i>
ECOLOGICAL RECEPTORS	
Dust soiling of Ecological Receptors (C)	<i>EIAR 9.4.4.2</i>
HUMAN & ECOLOGICAL RECEPTORS	
Indirect improvement in air quality and savings in NO _x emissions through renewable electricity production replacing fossil fuel electricity (positive impact) (O)	<i>EIAR 9.4.4.3</i>

All of the remaining effects of the Gathabawn Windfarm Project on Air Quality will have no likelihood of causing significant adverse effects to Air Quality receptors. A short evaluation of these effects is provided in [Section 9.4.5](#), with a list of these impacts provided in the table below.

Table 9-6: List of effects to Air Quality which will not be significant

Impact	Phase of the Development	Significance
Impacts to Human Receptors		
Dust health effects to Walkers on local Gathabawn Loop Walk	C	Imperceptible, Not Significant
Increase in airborne dust	O, D	Neutral
Impacts to Ecological Receptors		
Dust Soiling of Ecological Receptors	O, D	Neutral

EIAR 9.4.3.1 Increase in airborne dust

Sensitive Aspect:	Human receptors (Local Residents, residences and gardens)
Importance/Sensitivity:	High Importance, Medium Sensitivity (dust soiling) & Low Sensitivity (human health) (as per Section EIAR 9.3.3)

Impact Source(s)	Delivery of construction materials to works areas, excavation and relocation of soils, earthmoving
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Impact Pathway(s)	Air, wind
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Project Stage	Construction Phase
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Overview of Impact (general):

During dry and windy weather conditions, construction dust emissions will arise from construction activities such as excavations, earth moving and backfilling which may generate quantities of dust. Vehicles transporting potentially dusty material to and from the site also have the potential to cause dust generation along the concentrated haul routes from the construction areas. Dust deposition rates will be greatest within 50m of the source. An increase in airborne dust can cause dust soiling effects to property and increase the risk of dust-related health impacts to local residents.

Dust emissions will be short-term - once construction works cease, the air quality in the area will return to baseline conditions.

Examination of the Impact:

Proposed Gathabawn Windfarm Impact: The area of the proposed development is of medium sensitivity to dust soiling impacts and low sensitivity to dust-related human health impacts. Within the study area for residents, residences and gardens, there are a total of 25 no. residential properties within 250m of the construction works associated with the proposed development (i.e. the windfarm), of which

- 11 No. are within 250m of windfarm site roads (including Facilitating Works FW1, FW3, FW4, FW5, FW10 and FW12),
- 4 no. are within 250m of road widening works FW2 and FW11
- 17 no. are within 250m of Facilitating Works FW7, FW8 and FW9.
- 2 no. are within 250m of other windfarm construction works (LiDAR unit and hedgerow replanting)
- No sensitive human receptors within 250m of works at the turbine foundation and hardstanding locations or borrow pits.

There are also 2 no. receptors within 50m of the public road network used by construction material delivery vehicles, for the first 250m from the site exit points at the Ballylehaun Area.

It should be noted that some of the receptors listed above are within 250m of more than one element of the windfarm (e.g. the 4 no. receptors within 250m of the road widening works are also within 250m of the windfarm site roads).

There is at most a **medium risk of dust soiling impacts** related to the proposed construction works for the windfarm and a **low risk of dust-related human health impacts** as a result of the construction works. This is based on the magnitude of the works involved and the sensitivity of the surrounding area. In the absence of mitigation, **impacts will be short-term, localised, direct, negative and slight.**

Candidate Gathabawn Grid Connection Impact: The study area of the candidate grid connection is of high sensitivity to dust soiling impacts, and low sensitivity to dust-related human health impacts.

There are 17 no. sensitive receptors (residential properties) within 250m of the Ballylehaun-Ballyring Underground Cabling, 26 no. sensitive receptors within 250m of the Ballyring-Parksgrove Underground Cabling, and 9 no. sensitive receptors within 250m of the Parksgrove-Moatpark Underground Cabling. There are no sensitive receptors within 250m of the construction works associated with the Parksgrove Substation. There is at most a high risk of dust soiling impacts and a low risk of dust-related human health impacts as a result of the construction works for each of the Other Elements of the whole project. In the absence of mitigation, **impacts will be short-term, localised, direct, negative and moderate.**

Whole Project Impact: Overall, the cumulative impact of the whole project will be Not Significant.

Impact Magnitude	Short-term, localised, direct, negative	Impact Significance: (pre-mitigation)	Slight – Windfarm
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		Moderate – Grid Connection
Mitigation and Monitoring Measures: Even though Significant impacts are not predicted; the following mitigation and monitoring measures will be implemented as best practice environmental management.		
WM33 GM30	<u>Excavation of Materials:</u> The excavation of earth materials during the construction stage will be kept to a minimum. The excavation of materials will be completed in accordance with best practices for the management and treatment of such materials. (i.e. British Standards BS6031:2009 Code of Practice for Earthworks, and MAFF (2000) Good Practice for Handling Soils).	
WM34 GM31	<u>Storage of Overburden:</u> During construction works, excavated material will be removed for temporary or permanent storage at designated berms. All storage berms will be placed more than 50m away from any watercourse or wet drainage channel. Temporary silt control methods such as silt fencing or curtains will be placed around all overburden storage areas and/or installed between the berms and local watercourses or wet drainage channel, depending on the location, and the existing vegetative between the berms and watercourse / drainage features will be left in place.	
WM35	<u>Protection of Soils in Berms:</u> All storage berms will be graded and sealed following emplacement. Topsoil and subsoil will be stockpiled separately. Where possible, the upper vegetative layer (where still present) of excavated soil will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored spoil within the storage areas. Re-seeding will also be carried out in these areas. Measures such as interceptor ditches around the bases of these areas, and silt curtains will also be incorporated where required to prevent runoff of suspended solids, dust and soil erosion.	
WM44	<u>On-Site Borrow Pits:</u> It is proposed that bedrock won from the on-site borrow pits during the construction phase will be used to construct the sub-base layer of proposed upgraded and new access roads and hardstand areas. Once installed the sub-base layer will be overlain by a capping layer of clean high-grade bedrock, such as limestone.	
WM24 GM23	<u>Monitoring – Dust:</u> During working hours, the construction contractor will monitor dust control methods and weather forecasts for dry and windy conditions and will carry out weekly on-site and off-site inspections to monitor dust caused by the construction works. Public roads will be regularly inspected for cleanliness and regular dust soiling checks of surfaces along public roads and within 100m of site access points will also be carried out. The frequency of monitoring will be increased when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	
GM52	<u>Road traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804, and L5818; 30km/hr along the local roads L5821, L5820 and L18062; and 15km/hr along windfarm site roads.	
WM71 GM60	<u>Public Road – cleanliness:</u> To ensure that local roads are kept clean, a road sweeper will be used daily at road works locations, and as required at site access points.	
WM72	<u>Dust control:</u> Dust minimisation measures will be implemented during the construction works as follows: • The site roads will be regularly inspected and swept to remove build up of mud and aggregate materials from their surface, • Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and windy conditions. • Vehicles delivering material with dust potential will be enclosed or covered with tarpaulin to restrict the escape of dust. Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary	
GM61	<u>Dust Control:</u> Any loads of material which have the potential for dust emissions (such as aggregate) will be covered during transportation.	

Effectiveness of Mitigation and Monitoring Measures:

Once the mitigation measures are in place, impacts to air quality from construction dust emissions will be short-term, localised, direct, negative and imperceptible.

Residual Impact Significance (*post-mitigation*):**Imperceptible**

EIAR 9.4.3.2 Dust Soiling of Ecological Receptors

Sensitive Aspect:	Ecological Receptors
Importance/Sensitivity:	High Importance, High Sensitivity (as per Section EIAR 9.3.3)
Impact Source(s)	Delivery of construction materials to works areas, excavation and relocation of soils, earthmoving
Impact Pathway(s)	Air, wind
Project Stage	Construction Phase

Overview of Impact (general):

During dry and windy weather conditions, construction dust emissions will arise from construction activities such as excavations, earth moving and backfilling which may generate quantities of dust. Vehicles transporting potentially dusty material to and from the site also have the potential to cause dust generation along the concentrated haul routes from the construction areas. Dust deposition rates will be greatest within 50m of the source. An increase in airborne dust can cause dust impacts to sensitive ecology within 50m of the source.

Dust emissions will be short-term - once construction works cease, the air quality in the area will return to baseline conditions.

Examination of the Impact:

Proposed Gathabawn Windfarm Impact: The area of the proposed development is of high sensitivity to dust-related ecological impacts. Within the study area (50m from construction works boundary) the following ecological receptors are present (as per Section 9.3.1.3.2 and Figure 9.2):

- Cullahill Mountain SAC
- Cullahill Mountain pNHA
- Veteran trees at Ballylehaun
- Gales Hill nature reserve
- Hazel wood refuge for fauna and flora at Ballylehaun

Cullahill Mountain SAC and pNHA, designated for orchid-rich calcareous grassland, is located adjacent to the site boundary at the Ballylehaun Area. It is proposed to construct windfarm site roads between the construction compound and T2 (510m within 50m of the nature reserve), and the windfarm road between T2 and T3 (750m in length, of which 600m is within 50m of the SAC/pNHA/Nature Reserve). Within 50m of the SAC boundary, it is also proposed to construct the Ballylehaun Control Building and install c.910m of windfarm cabling (of which c.300m will be under hardcore area associated with the site roads and control building). The hazel wood at Ballylehaun is located c.120m from construction works areas, and will form part of a protected Biodiversity Area once construction is completed. There are c.40 no. veteran hawthorn trees within 50m of the works.

There is at most a **high risk of dust-related ecological impacts** related to the proposed construction works for the windfarm. This is based on the magnitude of the works involved and the sensitivity of the surrounding area. In the absence of mitigation, **impacts will be short-term, localised, direct, negative and moderate.**

Candidate Gathabawn Grid Connection Impact: Cullahill Mountain SAC and pNHA are within 20m of the Ballylehaun-Ballyring Underground Cabling. There is c.420m of cabling works associated with the Ballylehaun-Ballyring UGC within 20m of the boundary of Cullahill Mountain SAC and pNHA. At the other end of the grid connection, the River Barrow and River Nore SAC and the River Nore SPA and River Nore/Abbeyleix Woods Complex pNHA are within 20m of the Ballyring-Parksgrove UGC, Parksgrove-Moatpark UGC and the Parksgrove Substation. There is c.295m of Ballyring-Parksgrove UGC cabling works within 20m of these River Nore designations, while c.745m of trenching works and Horizontal Directional Drilling works associated with the Parksgrove-Moatpark UGC are within the boundary of the River Barrow and River Nore SAC and River Nore/Abbeyleix Woods Complex pNHA. There is at most a high risk of dust-related ecological impacts as a result of the construction works for each of the Other Elements of the whole project. In the absence of mitigation, **impacts will be short-term, localised, direct, negative and moderate.**

Whole Project Impact: Overall, the cumulative impact of the whole project will be Not Significant.

Impact Magnitude	Short-term, localised, direct, negative	Impact Significance: (pre-mitigation)	Moderate – Windfarm Moderate – Grid Connection
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Mitigation and Monitoring Measures: Even though Significant impacts are not predicted; the following mitigation and monitoring measures will be implemented as best practice environmental management.

WM55	<u>A barrier fence to control the extent</u> of construction works will be erected 5m from the boundary of the Cullahill Mountain SAC where works are within 75m of the SAC boundary. The placement of this barrier will be carried out before construction works commence in the area and under the supervision of the Ecological Clerk of Works. No works will take place beyond this barrier.
WM60	<u>Road Paving</u> : In order to reduce the potential for dust emissions, the uphill section of the windfarm site road between T2 and T3 will be paved with tarmac. A dry wheel wash will be installed on level ground before and after this road to reduce dirt on the wheels of vehicles travelled near to the boundary of the Cullahill Mountain SAC.
GM52	<u>Road traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804, and L5818; 30km/hr along the local roads L5821, L5820 and L18062; and 15km/hr along windfarm site roads.
WM33 GM30	<u>Excavation of Materials</u> : The excavation of earth materials during the construction stage will be kept to a minimum. The excavation of materials will be completed in accordance with best practices for the management and treatment of such materials. (i.e. British Standards BS6031:2009 Code of Practice for Earthworks, and MAFF (2000) Good Practice for Handling Soils).
WM34 GM31	<u>Storage of Overburden</u> : During construction works, excavated material will be removed for temporary or permanent storage at designated berms. All storage berms will be placed more than 50m away from any watercourse or wet drainage channel. Temporary silt control methods such as silt fencing or curtains will be placed around all overburden storage areas and/or installed between the berms and local watercourses or wet drainage channel, depending on the location, and the existing vegetative between the berms and watercourse / drainage features will be left in place.
WM35	<u>Protection of Soils in Berms</u> ; All storage berms will be graded and sealed following emplacement. Topsoil and subsoil will be stockpiled separately. Where possible, the upper vegetative layer (where still present) of excavated soil will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored spoil within the storage areas. Re-seeding will also be carried out in these areas. Measures such as interceptor ditches around the bases of these areas, and silt curtains will also be incorporated where required to prevent runoff of suspended solids, dust and soil erosion.
WM44	<u>On-Site Borrow Pits</u> : It is proposed that bedrock won from the on-site borrow pits during the construction phase will be used to construct the sub-base layer of proposed upgraded and new access roads and hardstand areas. Once installed the sub-base layer will be overlain by a capping layer of clean high-grade bedrock, such as limestone.
WM24 GM23	<u>Monitoring – Dust</u> : During working hours, the construction contractor will monitor dust control methods and weather forecasts for dry and windy conditions and will carry out weekly on-site and off-site inspections to monitor dust caused by the construction works. Public roads will be regularly inspected for cleanliness and regular dust soiling checks of surfaces along public roads and within 100m of site access points will also be carried out. The frequency of monitoring will be increased when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
WM71 GM60	<u>Public Road – cleanliness</u> : To ensure that local roads are kept clean, a road sweeper will be used daily at road works locations, and as required at site access points.
WM72	<u>Dust control</u> : Dust minimisation measures will be implemented during the construction works as follows: • The site roads will be regularly inspected and swept to remove build up of mud and aggregate materials from their surface, • Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and windy conditions.

	Vehicles delivering material with dust potential will be enclosed or covered with tarpaulin to restrict the escape of dust. Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary
GM61	<u>Dust Control</u>: Any loads of material which have the potential for dust emissions (such as aggregate) will be covered during transportation.
<u>Effectiveness of Mitigation and Monitoring Measures:</u> The proposed mitigation measures for the construction phase of the proposed Gathabawn Windfarm development will focus on the pro-active control of dust to minimise the generation of dust emissions at source. Additional measures beyond standard best practice have been proposed to account for the high-risk potential of the site and dust impacts to the nearby sensitive ecological sites. The mitigation measures that will be put in place during the construction of the proposed development will ensure that the impact of the development complies with the relevant limit values which are based on the protection of human health and the environment. Once the mitigation measures are in place, impacts to air quality from construction dust emissions will be short-term, localised, direct, negative and imperceptible.	
Residual Impact Significance (<i>post-mitigation</i>):	
Imperceptible	

EIAR 9.4.3.3 Indirect improvement in air quality and savings in NO_x emissions

Sensitive Aspect:	Human and Ecological Receptors
Importance:	High Importance, High Sensitivity (as per Section EIAR 9.3.3)
Impact Source(s)	Production of renewable energy
Impact Pathway(s)	National electricity system
Project Stage	Operational Phase

Overview of Impact (general):

The production of clean renewable energy through the climate change mitigation as a result of the proposed development will result in NO_x emissions savings by decreasing the amount of power produced by burning fossil fuels and subsequent air emissions. This will have a positive impact on transboundary air pollutants and compliance with the National Emissions Ceiling set under EU Directive 2016/2284.

Examination of the Impact:

The proposed windfarm will generate an estimated 150 GWh of renewable electricity per annum.

Based on data from the SEAI¹ on Ireland's electricity generation in recent years and data from the EPA² on Ireland's national NO_x emissions it is possible to estimate the NO_x savings associated with the production of clean renewable electricity in comparison to electricity generated from fossil fuels. The proposed windfarm development will result in an estimated saving of 39 tonnes NO_x per annum. This is equivalent to 0.10% of the 2020 – 2029 NO_x national emission ceiling set out under EU Directive 2016/2284. Over the predicted 35-year lifespan of the development this will equate to a total of 1,372 tonnes NO_x savings. This is an indirect, long-term, slight, positive impact to air quality.

Impact Magnitude	Long-term, indirect	Impact Significance: (pre-mitigation)	Slight, positive
Mitigation and Monitoring Measures: None required – Positive Effect			
Residual Impact Significance (post-mitigation):			Long-term, indirect, slight, positive

¹ SEAI (2025) Energy in Ireland 2025 Report (and previous annual reports)

² EPA (2026) Ireland's Air Pollutant Emissions Trends and Outlook 2026

EIAR 9.4.4 Impacts which will not be Significant

All of the remaining effects of the whole Gathabawn Windfarm Project on Air Quality will not be significant. A short evaluation of these effects is provided below.

EIAR 9.4.4.1 Impacts to Human Receptors which will not be Significant

Dust-related health effects to Walkers on local Gathabawn Loop Walk (C): Imperceptible impact. In relation to walkers on the local public roads, including the Gathabawn Loop Walk, sections of which are routed on the L5818 and L5821 which are subject to trenching works for the Candidate Gathabawn Grid Connection, due to the low sensitivity of these transient receptors, the impact of dust emissions is evaluated as a temporary, localised, Imperceptible, Negative and overall Not Significant effect. Dust emissions will be temporary - once construction works cease, the air quality in the area will return to baseline conditions.

Increase in airborne dust (O, D): Neutral impact. During operation, dust generating activities such as excavation and infilling works are not required. The only movement of soils during the operational phase relates to maintenance of the drainage networks. During decommissioning works, some soils stored in berms will be used to cover crane hardstands and turbine foundation areas. During both phases, the volumes of soils being moved will be very small, the movement of machinery and vehicles will be low, and the duration of works will be very brief. Any dust emissions will be of a negligible magnitude. The impact to air quality will be Neutral, and therefore will not be significant.

EIAR 9.4.4.2 Impacts to Ecological Receptors which will not be Significant

Dust Soiling (O, D): Neutral impact. There are five designated sites or designated habitats (Cullahill Mountain SAC, River Barrow and River Nore SAC, River Nore SPA, and two associated overlapping pNHA sites) and 3 other types of ecological receptor (Gales Hill Nature Reserve, hazel wood, and veteran hawthorn trees) within 50m of the construction works or within 250m of the site entrance. During operation, dust generating activities such as excavation and infilling works are not required. The only movement of soils during the operational phase relates to maintenance of the drainage networks. During decommissioning works, some soils stored in berms will be used to cover crane hardstands and turbine foundation areas. During both phases, the volumes of soils being moved will be very small, the movement of machinery and vehicles will be low, and the duration of works will be very brief. Any dust emissions will be of a negligible magnitude. The impact to air quality and ecological receptors will be Neutral, and therefore will not be significant.

EIAR 9.4.4.3 Summary of Impacts

There are **no likely Moderate, Significant, Very Significant or Profound impacts to Air** arising from the construction, operation or decommissioning of the Gathabawn Windfarm project.

All of the effects of the Proposed Gathabawn Windfarm project on Air will not be significant.

Human Receptors: The surrounding area within 250m of the windfarm construction works is of medium sensitivity to dust soiling and low sensitivity to dust-related human health impacts (including local residences with 250m of the windfarm construction works, and any walkers on the local roads and on the Gathabawn Loop Walk). There is a medium risk of dust soiling impacts from windfarm construction activities and a low risk of dust-related human health effects. The Candidate Gathabawn Grid Connection locations have a high sensitivity to dust soiling impacts and a low sensitivity to dust-related human health impacts within 250m of candidate grid connection works, and will result in a high risk of dust soiling impacts from construction activities and a low risk of dust-related human health effects. The volumes of traffic associated with the construction, operational and decommissioning stages are under the criteria for local air quality assessment as per TII guidance and no significant impacts from traffic emissions are predicted. **The whole project effect**

on human receptors is localised, direct, negative and imperceptible with mitigation in place. This is overall **Not Significant**.

Ecological Receptors: The surrounding area is of high sensitivity to dust-related ecological impacts. Sections of the Cullahill Mountain SAC are within 50m of the proposed windfarm works and 20m of the candidate grid connection works, while trenching and HDD works as part of the Candidate Gathabawn Grid Connection are within the boundary of the River Barrow and River Nore SAC. There is a high risk of dust-related ecological impacts from the windfarm construction activities and the candidate grid connection. **The whole project effect on ecological receptors is localised, direct, negative and imperceptible with mitigation in place. This is overall Not Significant.**

All of the residual effects of the Proposed Gathabawn Windfarm, and the Whole Gathabawn Windfarm Project on Air Quality will be **Imperceptible, and therefore Not Significant**.

EIAR 9.4.5 Environmental Protection Measures

The mitigation measures identified in Section EIAR 9.4.4.1 will be implemented during the construction/operation/decommissioning of the project and are included in the **Environmental Management Plan 2026 for the Gathabawn Windfarm project** which accompanies the subject planning application.

EIAR 9.5 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 Air with the Proposed Gathabawn Windfarm and the Candidate Gathabawn Grid Connection. These projects are referred to as 'Other Projects' herein. The potential for off-site and secondary consequential development is also considered.

A **Cumulative Study Area** is set out below and Other Projects located within this Study Area were identified and examined for potential for cumulative effects.

1. 500m from Gathabawn Windfarm Project construction works areas;
2. 100m of main transport routes used by construction traffic, up to 500m from the site exit points;
3. Within 200m of roads which will experience a significant change in traffic levels.

Local residents, and people using local amenities could potentially be affected by emissions from different directions either at the same time or sequentially, and therefore the distance from the source was doubled from that used for the Gathabawn Windfarm (the exception being traffic emissions along haulage routes, which remains the same, as cumulative impacts relate to any additional traffic on the affected road network or any other roads within 200m of a receptor).

The Other Projects which occur within the Cumulative Study Areas were subject to a cumulative scoping exercise, see Chapter 5 Description of the Development Appendix 5.4. As a result of this scoping exercise, some of these Other Projects were scoped IN for evaluation of cumulative effects, and these projects are listed below.

The Other Projects which have been Scoped-IN to the cumulative evaluations herein are identified in **Figure 9.3.1: Other Projects Scoped-In to the Air Quality Cumulative Evaluations** and **Figure 9.3.2: Other Projects Scoped-In to the Air Quality Cumulative Evaluations** (included at the end of this chapter).

EIAR 9.5.1 Evaluation of Cumulative Impacts with Other Projects

Other Projects Scoped In: Seskin WF Grid Connection (under appeal, ACP), Briskalagh WF Grid Connection (consented), Littleton WF Grid Connection (in planning), Battery Energy Storage Development 1 and 2 – all in the Parksgrove/Moatpark area; and the potential Killoshulan WF Grid Connection (preplanning) in the windfarm area and Parksgrove/Moatpark area.

The potential for cumulative effects with each of the Other Projects is evaluated below. The evaluation takes into account existing sources of pollution or damage identified in Section EIAR 9.3.2.

Although it is unlikely to occur, there is potential that the Extension to the EirGrid Substation compound, the Battery Energy Storage development and the grid connections for Briskalagh WF, Littleton WF, Seskin Wind Farms and the potential Killoshulan WF could all be constructed during the same time period as the Candidate Gathabawn Grid Connection. When dust and emissions from all of these works is considered cumulatively, it is evaluated that the cumulative impacts will be short-term, localised, negative and **imperceptible**.

Mitigation measures will be put in place during the construction of the Candidate Gathabawn Grid Connection which will mitigate the potential for significant dust emissions, therefore, the potential for cumulative impacts is significantly reduced and are collectively predicted to be **Imperceptible and not significant**.

In the windfarm area, although it is unlikely to occur, there is potential that the Potential Killoshulan Wind Farm Grid Connection could be constructed at the same time as the Proposed Gathabawn Windfarm. The

potential grid connection may be routed along the L1806, adjacent to Facilitating Works FW8 and FW9. The L1806 is also used by construction delivery vehicles accessing the Ballyring Area. When dust and emissions from all of these works are considered cumulatively, it is evaluated that the cumulative impacts will be short-term, localised, negative and imperceptible.

Mitigation measures will be put in place during the construction of the Proposed Gathabawn Windfarm which will mitigate the potential for significant dust emissions, therefore the potential for cumulative impacts is significantly reduced and are collectively predicted to be **Imperceptible and not significant**.

EIAR 9.5.2 Summary of Cumulative Evaluations

Overall, it is evaluated that **adverse cumulative impacts to Air of the Gathabawn Windfarm cumulatively as a whole project and with Other Projects will be Not Significant**.

EIAR 9.6 SUMMARY CONCLUSION

HUMAN RECEPTORS (Local Residents, Residences and Gardens):

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.

Air quality can be negatively impacted during the construction, operational and decommissioning phases of the proposed development as a result of earthmoving and the excavation and relocation of soils, as well as movement of construction vehicles and construction activities. There is at most a medium risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the Gathabawn Windfarm and candidate grid connection. Mitigation measures will be put in place to avoid significant dust emissions.

Impacts are predicted to be direct, localised, negative, and imperceptible and therefore not significant.

It is noted that the volumes of HGV traffic will be under the threshold criteria for a local air quality assessment, as set out by Transport Infrastructure Ireland PE-ENV-01106 guidance and therefore traffic emissions will not significantly impact air quality.

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.

Similar to human receptors, dust emissions from construction activities can impact sensitive ecology. There is a high risk of dust-related ecological impacts associated with the proposed development. Mitigation measures will be implemented to prevent significant dust emissions. **Impacts are predicted to be direct, localised, negative, and imperceptible and therefore not significant.**

Indirect improvement in air quality and savings in NO_x emissions:

It was also evaluated that there will be an improvement in air quality as a result of renewable energy production (which will offset fossil fuel generation) during the operational phase. Based on the generation of 150 GWh of renewable electricity the indirect reduction in NO_x emissions will be an indirect, long-term, slight, positive impact to air quality.

CUMULATIVE: Given the low number of sensitive receptors surrounding the Gathabawn Windfarm, which will not cause significant impacts on local air quality, and taking into account the location and linear nature of the Candidate Gathabawn Grid Connection, and the nature and extent of Other Projects and their separation distance to the Gathabawn Windfarm works sites within the cumulative study area, **no significant cumulative effects of the whole project with Other Projects are predicted.**

MITIGATION MEASURES: Even though significant effects to Air quality are not predicted, dust control measures are included in the Environmental Management Plan for the whole Gathabawn Windfarm project.

To conclude, it is thus evaluated that adverse impacts to Air of the Gathabawn Windfarm, both alone and cumulatively with Other Projects will be no greater than **Imperceptible adverse, and 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). This impact will be **Indirect, Slight and Positive**.

EIAR 9.7 Glossary, List of Abbreviations

Glossary of Terms

Term	Definition
Gathabawn Windfarm	Twelve wind turbines are proposed for two areas – seven turbines in the Ballylehaun area and five turbines in the Ballyring area. In addition to the turbines and their hardstanding areas, the windfarm also includes site access roads, two Control Buildings; a met mast, underground cabling, temporary works to facilitate turbine deliveries, and other associated and ancillary works.
Candidate Gathabawn Grid Connection	Underground cabling between the Ballylehaun and Ballyring Areas (Ballylehaun-Ballyring UGC), underground cabling from the Ballyring Area (from Ballyring Control Building) to a new substation at Parksgrove (Ballyring-Parksgrove UGC), the Parksgrove Substation, and underground cabling from the substation to the existing Eirgrid Ballyragget Substation in Moatpark (Parksgrove-Moatpark UGC). The Candidate Gathabawn Grid Connection is not included as part of this Planning Application , it will be subject of 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 Project.
Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site

List of Abbreviations

Abbreviation	Full Term
Gathabawn Windfarm	Twelve wind turbines are proposed for two areas – seven turbines in the Ballylehaun area and five turbines in the Ballyring area. In addition to the turbines and their hardstanding areas, the windfarm also includes site access roads, two Control Buildings; a met mast, underground cabling, temporary works to facilitate turbine deliveries, and other associated and ancillary works.
Candidate Gathabawn Grid Connection	Underground cabling between the Ballylehaun and Ballyring Areas (Ballylehaun-Ballyring UGC), underground cabling from the Ballyring Area (from Ballyring Control Building) to a new substation at Parksgrove (Ballyring-Parksgrove UGC), the Parksgrove Substation, and underground cabling from the substation to the existing Eirgrid Ballyragget Substation in Moatpark (Parksgrove-Moatpark UGC).
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
HDV	Heavy Duty Vehicle with a gross weight greater than 3.5 tonnes
IAQM	Institute of Air Quality Management
PM	Abbreviation for Particulate Matter suspended in the air. PM ₁₀ is airborne particulate matter with an aerodynamic diameter less than 10 microns (µm); PM _{2.5} is less than 2.5µm
pNHA	Proposed Natural Heritage Area
SAC	Special Area of Conservation
SEAI	Sustainable Energy Authority of Ireland
SPA	Special Protection Area
TII	Transport Infrastructure Ireland

ElAR 9.8 Reference List

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EIAR 9.9 List of Figures

FIGURES (overleaf)

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Figure 9.2	Construction Dust - Ecological Receptors
Figure 9.3.1	Other Projects Scoped-In to the Air Quality Cumulative Evaluations
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EIAR 9.10 List of Appendices

APPENDICES (overleaf)

Appendix 9.1	Methodology for the evaluation of Air Quality
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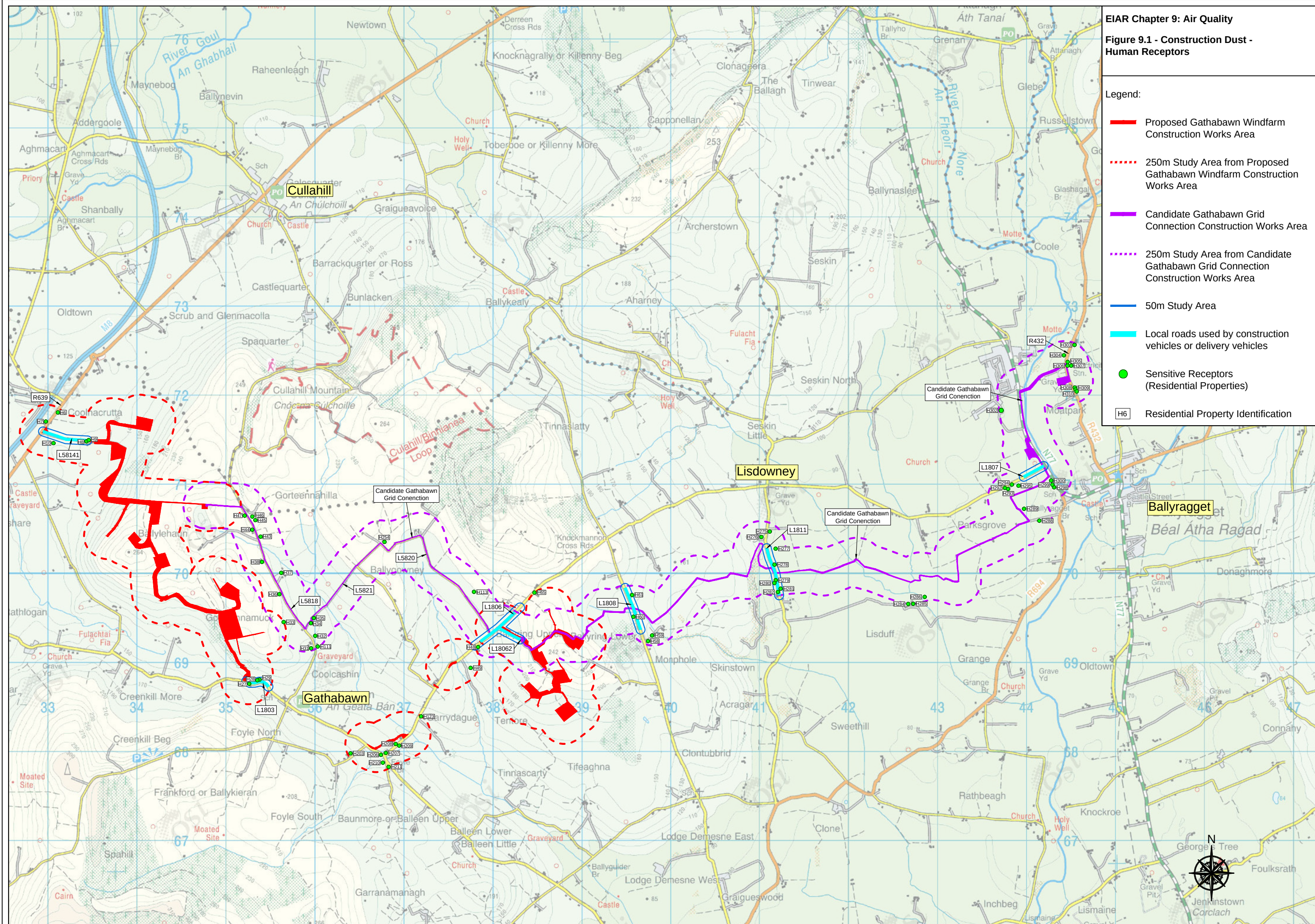
Figures

ElAR Chapter 9: Air Quality

Figure 9.1 - Construction Dust - Human Receptors

Legend:

- Proposed Gathabawn Windfarm Construction Works Area
- 250m Study Area from Proposed Gathabawn Windfarm Construction Works Area
- Candidate Gathabawn Grid Connection Construction Works Area
- 250m Study Area from Candidate Gathabawn Grid Connection Construction Works Area
- 50m Study Area
- Local roads used by construction vehicles or delivery vehicles
- Sensitive Receptors (Residential Properties)
- Residential Property Identification



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Figure 9.2 - Construction Dust - Ecological Receptors

Legend:

- Proposed Gathabawn Windfarm Construction Works Area
- 50m Study Area from Proposed Gathabawn Windfarm Construction Works Area
- Candidate Gathabawn Grid Connection Construction Works Area
- 50m Study Area from Candidate Gathabawn Grid Connection Construction Works Area
- 50m Study Area
- Local roads used by construction vehicles or delivery vehicles
- River Nore SPA
- Cullahill Mountain SAC
- River Barrow & River Nore SAC
- Cullahill Mountain pNHA
- River Nore/Abbeyleix Woods Complex pNHA
- Veteran Trees
- Gales Hill Nature Reserve
- Hazelwood

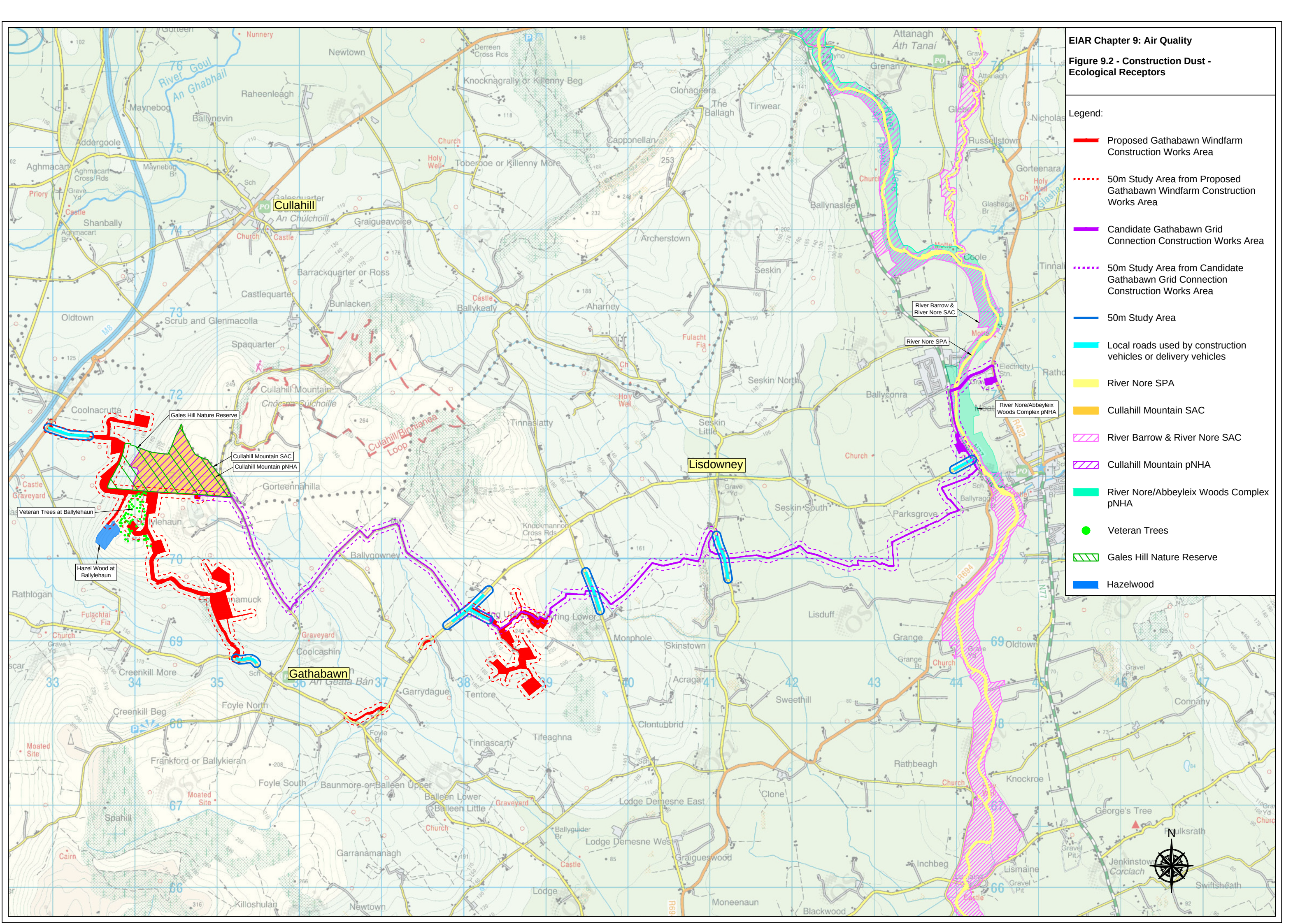
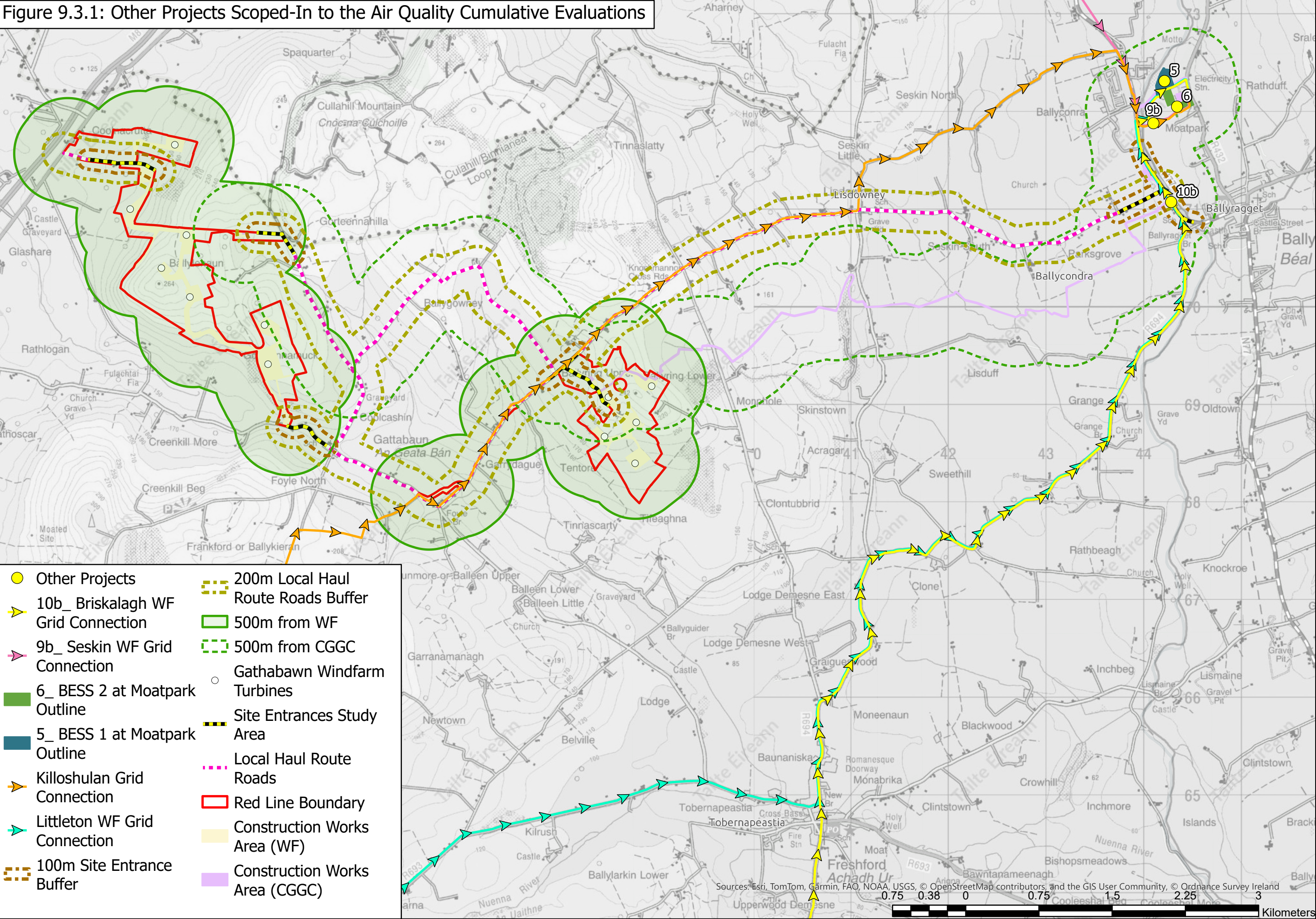
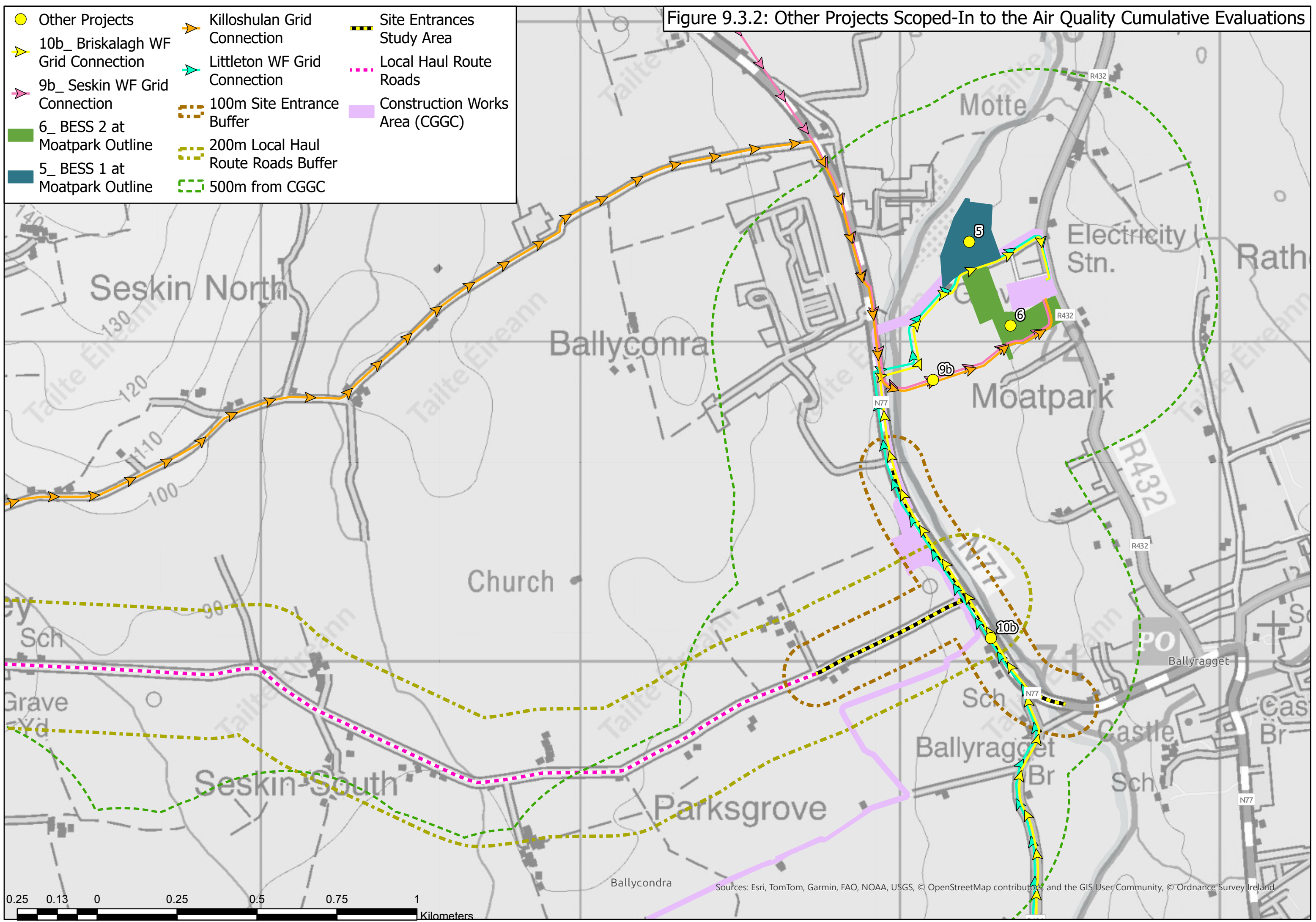


Figure 9.3.1: Other Projects Scoped-In to the Air Quality Cumulative Evaluations





Appendix to Chapter 9: Air Quality

Appendix 9.1: Methodology for the evaluation of Air Quality

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A9.1 Methodology Applied during the preparation of Chapter 9: Air Quality

A9.1.1 Legislation, Regulations & Guidance Documents

The following legislation and regulations and have been taken into account in this EIA Report:

- EU Directive 2024/2881 of 23 October 2024 on ambient air quality and cleaner air for Europe (recast) – supersedes EU Directive 2008/50/EC and sets new air quality limit values to be achieved by 2030.
- EU Directive 2008/50/EC – Established ambient air quality standards and limit values for certain air pollutants in order to protect human health and the environment.
- S.I. No. 739/2022 – Ambient Air Quality Standards Regulations 2022

The recommendations in the guidelines listed below, have been considered during the preparation of this chapter:

- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (TII, 2025)
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

A9.1.2 Methodology Used for Baseline Environment and Impact Evaluations – Air Quality

The criteria used for the scoping and subsequent impact evaluation in this report is based on Directive (EU) 2024/2881, the Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* and Transport Infrastructure Ireland (TII) guidance document PE-ENV-01106. The author's experience with EIA preparation and air quality management also informs this report.

A9.1.2.1 Air Quality Standards

National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants to reduce the risk to health from poor air quality. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast). This directive supersedes EU Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (CAFE Directive). It sets out new air quality standards for pollutants to be reached by 2030 which are more closely aligned with the World Health Organisation (WHO) air quality guidelines and also includes limit values applicable until 2030.

The Ambient Air Quality Standards Regulations 2022 (S.I. 739 of 2022) (the Air Quality Standards Regulations 2022) further transposed Directive 2008/50/EC and revoked the Air Quality Standards Regulations 2011, as amended. With the adoption of Directive (EU) 2024/2881, Ireland must similarly transpose this directive into national law, i.e. update the Air Quality Standards Regulations, before December 2026.

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for pollutants to be achieved by 1 January 2030, these are more closely aligned with the WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11

December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

In relation to the proposed development, the applicable limit values are for particulate matter (PM₁₀ and PM_{2.5}). Table 1 outlines the limit values pre-2030 and post-2030 for the specified pollutants.

Table 1: EU Ambient Air Quality Limit Values

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value (to be attained by 2030)
Particulate Matter (as PM ₁₀)	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM _{2.5})	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m ³
	Annual limit for protection of human health	25 µg/m ³	Annual limit for protection of human health	10 µg/m ³

A9.1.2.2 Transport Infrastructure Ireland (TII) Guidance on Traffic Based Air Pollutants

The TII guidance document PE-ENV-01106 (TII, 2025) uses the following screening criteria to determine if a detailed air modelling assessment of traffic emissions is required for a proposed development. If any road links¹ meet one or more of the following criteria it can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment of traffic emissions.

The proposed development will not change the traffic on the surrounding road network by an amount greater than the criteria listed in Table 2, and as a result a local air quality assessment of traffic emissions was not required.

Table 2: TII Screening Criteria for Air Quality Assessment

TII Criteria	Criteria met?
Road alignment change of 5 meters or more	No, no change in road alignments
Annual Average Daily Traffic (AADT) flow changes by 1,000 or more	No, daily traffic substantially below 1000 Annual Average Daily Traffic (AADT)
HDVs flows changes by 200 AADT or more	No, HDV flows below 200 vehicles/day
Daily average speed changes by 10 km/h or more	No, no change in average speed
Peak hour speed changes by 20 km/h or more	No, no change in peak hour speed

¹ A road link is where the existing road network is broken up into sections of road with similar traffic conditions (traffic composition, speed and flow).

A9.1.2.3 IAQM Guidance on Construction Dust Emissions

The Institute of Air Quality Management in the UK (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (2024) outlines an assessment method for predicting the impact of dust emissions from earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase in order to predict the likely magnitude of the dust impacts on sensitive receptors and to determine the level of site-specific mitigation required.

A9.1.2.4 IAQM Guidance on Identifying Sensitive Receptors

The IAQM Guidance states that an assessment of dust impacts will be required where there is a ‘human receptor’ within 250m of the boundary of the works or within 50 m of routes used by construction vehicles. Dust impacts can occur up to 250m for the source, however, the greatest impacts will occur within the first 50m. According to the IAQM Guidance a ‘**human receptor**’ refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling², or exposure to PM₁₀ over a time period relevant to the air quality objectives.

In relation to sensitive ecology, the IAQM require an assessment of dust impacts where there is a sensitive **ecological receptor** within 50m of the boundary of the works or within 50m of routes used by construction vehicles.

Examples of the different types of high, medium and low sensitivity receptors are outlined in the Table 3 below.

Table 3: Examples of Sensitive Receptors as per IAQM Guidance

<u>Sensitive Receptors to Dust Soiling Effects</u>	
High	locations where users can expect enjoyment of a high level of amenity
	appearance, aesthetics, value of property diminished by soiling
	people or property present either continuously or for extended periods of time
Medium	locations where users expect to enjoy a reasonable level of amenity
	appearance, aesthetics, value of property diminished by soiling
	people or property <u>not</u> present continuously or regularly for extended periods of time
Low	locations where enjoyment of amenity is <u>not</u> reasonably expected
	property <u>not</u> expected to be diminished in appearance, aesthetics, value by soiling
	areas of transient exposure where people or property are passing through or by an area
<u>Sensitivities of People to the Health Effects of PM₁₀</u>	
High	Areas where people are exposed over a time period relevant to the air quality objective for PM ₁₀ (Air Quality Standards established under Directive 2008/50/EC are reproduced in Table 1)
Medium	locations where the people exposed are workers
Low	locations where human exposure is transient

² As Per IAQM guidance 2014: Occupational settings are relevant in terms of annoyance effects.

<u>Sensitive Ecological Receptors</u>	
High	locations with an international or national designation and the designated features may be affected by dust soiling (e.g. SAC)
Medium	locations with a national designation where the features may be affected by dust deposition (e.g. NHA / pNHA)
Low	locations with a local designation where the features may be affected by dust deposition (e.g. local nature reserve)

A9.1.2.5 IAQM Guidance on Evaluating the Sensitivity of the Area

According to IAQM Guidance (2024), the sensitivity of an area to construction dust impacts from either dust soiling or health impacts from PM₁₀ is assessed using the criteria outlined in Table 4 to Table 6. This is based on the sensitivity of the receptor, the number of receptors and their distance from the dust source.

The sensitivity of the area to dust-related ecological impacts is assessed using the criteria in Table 6, which takes account of the sensitivity of the ecological receptor (e.g. SAC/SPA, NHA, pNHA, local nature reserve) and the distance from the source.

With regards to the sensitivity of the area a 'worst-case' approach has been taken in this assessment whereby the area with the majority of sensitive receptors within the closest distance to the works area have been assessed. This will establish the highest possible level of risk associated with any element of the proposed development for either dust soiling or health impacts from PM₁₀; then the appropriate level of mitigation or best practice measures can be established, if necessary, based on a high, medium or low level of risk.

In relation to the Proposed Gathabawn Windfarm, it has been established that the area of the windfarm site is of **medium sensitivity** to dust soiling impacts and **low sensitivity** to dust-related human health impacts as there are 5 no. high sensitivity residential properties within 20m of the windfarm site construction works boundary. In relation to the Candidate Gathabawn Grid Connection, it has been established that the area of the candidate grid connection works is of **high sensitivity** to dust soiling impacts and **low sensitivity** to dust-related human health impacts as there are 13 no. high sensitivity residential properties within 20m of the candidate grid connection works.

With regard to potential dust-related ecological impacts, it has been established that the surrounding area is of **high sensitivity** as sections of the Cullahill Mountain SAC and River Barrow and River Nore SAC are within 20m of the construction works boundary. These are a high sensitivity receptor because of their European designation as Natura 2000 sites.

Table 4: Sensitivity of an area to dust soiling effects on people and property (in bold)

<u>Receptor Sensitivity</u>	Number of Receptors	<u>Distance from the Source (m)</u>			
		less than 20	less than 50	less than 100	less than 250
High	greater than 100	High	High	Low	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	1 or more	Medium	Low	Low	Low
Low	1 or more	Low	Low	Low	Low

(Note: The sensitivity of the area to dust soils effects from the Proposed Gathabawn Windfarm and Candidate Gathabawn Grid Connection are identified in bold text with yellow and blue background respectively)

Table 5: Sensitivity of an area to dust-related human health impacts

Receptor Sensitivity	Annual Mean PM ₁₀ concentration	Number of Receptors	Distance from the Source (m)			
			less than 20m	less than 50m	less than 100m	less than 250m
High	less than 24 µg/m ³	greater than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	less than 24 µg/m ³	greater than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	less than 24 µg/m ³	1 or more	Low	Low	Low	Low

(Note: The sensitivity of the area to dust soils effects are identified in bold text with yellow background)

Table 6: Sensitivity of the area of dust-related ecological impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

(Note: The sensitivity of the area to dust soils effects are identified in bold text with yellow background)

A9.1.2.6 IAQM Guidance on Evaluating the Magnitude of Dust Emissions

Earthworks will primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area $>110,000 \text{ m}^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds $>6 \text{ m}$ in height;
- **Medium:** Total site area $18,000 \text{ m}^2 - 110,000 \text{ m}^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds $3\text{m} - 6\text{m}$ in height; and
- **Small:** Total site area $<18,000 \text{ m}^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds $<3 \text{ m}$ in height.

The worst-case classification for dust emission magnitude (earthworks) is large due to the total site area involved in the proposed Gathabawn Windfarm and Candidate Gathabawn Grid Connection including the Windfarm Substation location, location of the construction compound and temporary borrow pits.

Construction: Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume $>75,000 \text{ m}^3$, on site concrete batching, sandblasting;
- **Medium:** Total building volume $12,000 \text{ m}^3 - 75,000 \text{ m}^3$, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small:** Total building volume $<12,000 \text{ m}^3$, construction material with low potential for dust release (e.g. metal cladding or timber).

The worst-case classification for dust emission magnitude (construction) is small as there are minimal buildings involved in the proposed development. The control buildings at the substation site are the main buildings to be constructed. The total building volume involved will be significantly less than $12,000 \text{ m}^3$. The turbines themselves are constructed from metal which has a low potential for dust release.

Trackout: In relation to trackout, factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** >50 HDV ($>3.5\text{t}$) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length $>100 \text{ m}$;
- **Medium:** $20-50$ HDV ($>3.5\text{t}$) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length $50 \text{ m} - 100 \text{ m}$; and
- **Small:** <20 HDV ($>3.5\text{t}$) outward movements in any one day, surface material with low potential for dust release, unpaved road length $<50 \text{ m}$.

The worst-case classification for dust emission magnitude (trackout) is small as there are unlikely to be greater than 20 outward HDV movements per day during the construction of the proposed development.

A9.1.2.7 IAQM Guidance on Evaluating the Risk of Dust Impacts

The sensitivity of the area (low sensitivity for dust soiling and low sensitivity for human health) is combined with the dust emission magnitude for the earthworks, construction and trackout categories to define the risk of dust impacts in the absence of mitigation. The IAQM criteria used to determine the risk of impacts is detailed in Table 7.

Table 7: IAQM Criteria to Determine Risk of Dust Impacts

<u>Sensitivity of Area</u>	<u>Dust Emission Magnitude</u>		
	Large	Medium	Small
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

The results of the assessment for each category are outlined in Table 8 for the Gathabawn Windfarm and Table 9 for the Candidate Grid Connection.

The proposed Gathabawn Windfarm has a worst-case medium risk of dust soiling impacts and a worst-case low risk of dust-related human health impacts. There is a high risk of dust-related ecological impacts associated with the proposed development.

Table 8: Risk of Dust Impacts in relation to earthworks, construction and trackout – Proposed Gathabawn Windfarm

<u>Potential Impact</u>	<u>Dust Emission Risk</u>		
	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Low Risk
Human Health	Low Risk	Negligible Risk	Negligible Risk
Ecology	High Risk	Low Risk	Low Risk

The Candidate Gathabawn Grid Connection has a high risk of dust soiling impacts and a low risk of dust-related human health impacts. There is a high risk of dust-related ecological impacts associated with the Candidate Grid Connection.

Table 9: Risk of Dust Impacts in relation to earthworks, construction and trackout – Candidate Grid Connection

Potential Impact	<u>Dust Emission Risk</u>		
	Earthworks	Construction	Trackout
Dust Soiling	High Risk	Low Risk	Low Risk
Human Health	Low Risk	Negligible Risk	Negligible Risk
Ecology	High Risk	Low Risk	Low Risk

