# 18 AIR QUALITY

## 18.1 INTRODUCTION

This chapter assesses the likely significant direct and indirect effects of the Project (**Figure 1.2**) on air quality. The Project refers to all elements of the application for the construction of Carrigeen Renewable Energy Development (**Chapter 2: Project Description**). Where adverse effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment considers the potential effects during the following phases of the Project:

- Construction of the Project
- Operation of the Project
- Decommissioning of the Project

Common acronyms used throughout this Environmental Impact Assessment Report (EIAR) can be found in **Appendix 1.4.** This chapter of the EIAR is supported by Figures provided in Volume III and by Appendix documents provided in Volume IV of this EIAR.

### 18.1.1 Statement of Authority

Jennings O'Donovan & Partners Ltd. (JOD) have extensive experience in all aspects of wind farm development, from design and planning stages through to construction. JOD have been active as engineering consultants in the wind energy market in Ireland since 1998 and have completed numerous wind farm projects, varying from single wind turbine installations to large-scale, multi-turbine developments with a total of over 2,000 MW generation capacity

This chapter has been prepared by Kathlyn Feeney and Ciara Gilligan of JOD.

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Ciara Gilligan is a Senior Environmental Scientist at JOD with over 8 years of experience in environmental consultancy. She holds a BSc (Hons) in Earth and Ocean Sciences from the University of Galway and recently completed a micro-credential course in Environmental Impact Assessment of Marine Renewable Energy Developments at the same university.

Ciara has worked extensively on planning applications for large-scale infrastructure projects across Ireland and the UK, including renewable energy, interconnectors, and water/wastewater schemes. Her expertise includes the preparation of Environmental Impact Assessments, Ecological Impact Assessments and Appropriate Assessments.

The chapter has been reviewed by Ms. Sarah Moore. Sarah Moore is an Environmental Scientist in JOD with over 17 years of environmental consultancy experience. She has obtained a MSc in Environmental Engineering from Queens University, Belfast, and a BSc in Environmental Science from University of Limerick. Since joining JOD, Sarah has been involved as a Project Environmental Scientist on a range of renewable energy, wastewater, structures and commercial projects. She has experience in the preparation of Appropriate Assessments, Ecological Impact Assessments, Environmental Impact Assessments, Shadow Flicker analysis and Geographic Information Systems.

### 18.1.2 Background and Objectives

Air quality in Ireland is generally of a high standard across the country and is amongst the best in Europe; however, levels of some pollutants remain of concern, with those produced by traffic approaching limit values in urban areas. The combustion of fossil fuels for energy results in the release of several gases which contribute to poor air quality, climate change and acid rain, including carbon dioxide ($CO_2$), sulphur dioxide ($SO_2$), nitrogen oxides (NOx), and Particulate Matter ($PM_{10}$ and $PM_{2.5}$).

This chapter assesses the following as per the EIA Directive:

- The air quality environment of the area of the Project and the potential effects on air quality during the construction, operation and decommissioning phases of the Project. This assessment includes mitigation measures, residual effects and cumulative impacts of the Project.

### 18.1.3 Relevant Legislation and Guidance

The assessment has been prepared in accordance with the relevant legislation and having regard to the relevant guidance listed below:

- The Ambient Air Quality and Cleaner air for Europe (recast) Directive 2024/2881[1].
- The Clean Air for Europe (CAFE) Directive[2], as amended by Commission Directive (EU) 2015/1480, as amended (the "**CAFE Directive**").

[1] European Parliament and Council, (2024). *Directive (EU) 2024/2881 on ambient air quality and cleaner air for Europe*. Available at: https://eur-lex.europa.eu/eli/dir/2024/2881/oj/eng [Accessed 26th February 2026].
[2] European Commission, (1996). Council Directive 96/62/EC on ambient air quality assessment and management. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=uriserv:l28026 [Accessed 26th February 2026].

- The Ambient Air Quality Standard Regulations 2022[3] (S.I. No. 739/2022).
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports[4] – June 2022 (EPA, 2022).
- Environmental Protection Agency (2025) Air Quality in Ireland Report 2024[5].
- WHO global air quality guidelines[6] (2021) Particulate matter (PM2.5 and PM 10), ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide.
- IAQM (2024) Guidance on the assessment of dust from demolition and construction[7], version 2.2.
- IAQM (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning[8], Institute of Air Quality Management 2016.
- Government of Ireland (2023) Clean Air Strategy for Ireland[9].
- Roscommon County Council Climate Action Plan 2024-2029[10].
- Roscommon County Development Plan 2022-2028[11].
- Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106[12] (TII, 2022a).

### 18.1.4 Assessment Structure

In line with the EIA Directive and current EPA guidelines listed in **Chapter 1: Introduction**, **Section 1.10.2** the structure of this air quality chapter is as follows:

- Assessment Methodology and Significance Criteria.
- Description of baseline conditions at the Wind Farm Site.
- Identification and assessment of impacts to air quality with the Project, during the construction, operational and decommissioning phases.
- Mitigation measures to avoid or reduce the effects identified.

[3] Department of Environment, Climate and Communications 2022). S.I. No. 739/2022 - Ambient Air Quality Standards Regulations 2022. Available at: https://www.irishstatutebook.ie/eli/2022/si/739/made/en/print [Accessed 26th February 2026].
[4] Environmental Protection Agency, (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment-reports-eiar.php [Accessed 26th February 2026].
[5] Environmental Protection Agency, (2025). Air Quality in Ireland 2024. Available at: https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2024.php [Accessed 26th February 2026].
[6] World Health Organization, (2021). WHO global air quality guidelines: PM2.5, PM10, ozone, $NO_2$, $SO_2$ and CO. Available at: https://www.who.int/publications/i/item/9789240034228 [Accessed 26th February 2026].
[7] Institute of Air Quality Management, (2024). Guidance on the assessment of dust from demolition and construction. Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf [Accessed 26th February 2026].
[8] Institute of Air Quality Management, (2016). Guidance on the assessment of mineral dust impacts for planning. Available at: https://iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf [Accessed 26th February 2026].
[9] Department of Climate, Energy and the Environment, (2023). Clean Air Strategy for Ireland. Available at: https://assets.gov.ie/static/documents/clean-air-strategy.pdf [Accessed 26th February 2026].
[10] Roscommon County Council, (2024). Roscommon County Council Climate Action Plan 2024–2029. Available at: https://www.roscommoncoco.ie/en/services/climate-action/roscommon-climate-action-plan/roscommon-county-council-climate-action-plan-.pdf [Accessed 26th February 2026].
[11] Roscommon County Council, (2022). Roscommon County Development Plan 2022–2028. Available at: https://www.rosdevplan.ie/roscommon-county-development-plan-2022-2028/ [Accessed 26th February 2026].
[12] Transport Infrastructure Ireland, (2025). TII Publications Document ID 3217. Available at: https://www.tiipublications.ie/document/?id=3217 [Accessed 26th February 2026].

- Identification and assessment of residual effects of the Project considering mitigation measures.
- Identification and assessment of cumulative effects if and where applicable.
- Conclusion as to likely significant effects of the Project on air quality.

The desktop study as outlined in **Section 18.2**, together with the other assessments detailed in this chapter, provide the planning authority with sufficient details regards air quality assessment for the Project.

### 18.1.5 Assessment Methodology and Significance Criteria

In this section, a description of the methods employed for each part of the assessment, are outlined. The methodology complies with guidance and best practice.

The following data and reports were employed to assess the baseline air quality:

- Air quality limit values of CAFE Directive are compared with the recorded local and national emission values for the year 2022.
- Review of relevant WHO and EPA Air Quality reports.
- Review of Air Quality Zones in Ireland.
- A review of the contributors to the local air quality conditions.
- A review of local and national climate conditions.

**Do Nothing Impact Assessment:** This section outlines the potential impacts if the Project does not proceed, including the likely natural evolution of the site in the absence of the Project, based on the baseline scenario.

**Significance of effects:** The significance of effects resulting from the Project is determined through consideration of a combination of the sensitivity of the receiving environment and the predicted level of change from the baseline state, as outlined in **Chapter 1: Introduction**, **Table 1.4** and **Table 1.5**. Where adverse effects are predicted, appropriate mitigation approaches are identified.

**Mitigation measures:** The mitigation hierarchy approach, as outlined in **Chapter 1: Introduction**, of Avoidance, Reduction/ Elimination and Remedy aims to avoid significant impact through embedded mitigation (avoidance), and where avoidance is not possible, through mitigation measures. Remedy, the lowest rung of the mitigation hierarchy is only considered where mitigation measures are not feasible or possible.

**Cumulative Assessment:** The potential cumulative effects on air quality are assessed by considering other large developments (both operational and in the planning process) within a 20km radius of the Project, as shown in **Appendix 2.4** of the EIAR. This assessment takes into account all phases of the Project (construction, operation, and decommissioning) in conjunction with these nearby projects. The study area for cumulative assessment is consistent with the EPA "Guidelines on the information to be contained in environmental impact assessment reports" (2022) and best practice.

## 18.2 AIR QUALITY

### 18.2.1 Air Quality Standards

The new Directive, recasting Directives 2004/107/EC4 and 2008/50/EC, prioritises the health of EU citizens. It sets new air quality standards for pollutants to be reached by 2030 which are more closely aligned with the WHO air quality guidelines. It will also ensure early action, with air quality roadmaps that need to be prepared ahead of 2030 if there is a risk that the new standards will not be attained by that date.

This directive entered into force on December 10th 2024 and has to be implemented in national regulation on December 11, 2026, at the latest. **Table 18.1** outlines the limit values and target dates set out in the Ambient Air Quality Recast Directive.

**Table 18.1: Limit values of Ambient Air Quality Recast Directive 2024/2881**

| Pollutant | Limit Value Objective | Averaging Period | Limit Value (µg/m³) Attained by 11/12/2026 | Basis of Application of Limit Value | Limit Value (µg/m³) Attained by 01/01/2030 | Basis of Application of Limit Value |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | Protection of Human Health | 1 day | na | na | 25 | not to be exceeded more than 18 times per calendar year |
| | | Calendar year | 25 | na | 10 | na |
| $PM_{10}$ | Protection of Human Health | 1 day | 50 | not to be exceeded more than 35 times per calendar year | 45 | not to be exceeded more than 18 times per calendar year |
| | | Calendar year | 40 | na | 20 | na |

| Pollutant | Limit Value Objective | Averaging Period | Limit Value (µg/m³) Attained by 11/12/2026 | Basis of Application of Limit Value | Limit Value (µg/m³) Attained by 01/01/2030 | Basis of Application of Limit Value |
|---|---|---|---|---|---|---|
| Nitrogen dioxide ($NO_2$) | Protection of Human Health | 1 hour | 200 | not to be exceeded more than 18 times per calendar year | 200 | not to be exceeded more than 3 times per calendar year |
| | | 1 day | na | na | 50 | not to be exceeded more than 18 times per calendar year |
| | | Calendar year | 40 | na | 20 | na |
| Sulphur dioxide ($SO_2$) | Protection of Human Health | 1 hour | 350 | not to be exceeded more than 24 times per calendar year | 350 | not to be exceeded more than 3 times per calendar year |
| | | 1 day | 125 | not to be exceeded more than 3 times per calendar year | 50 | not to be exceeded more than 18 times per calendar year |
| | | Calendar year | na | na | 20 | na |
| Benzene | Protection of Human Health | Calendar year | 5 | na | 3.4 | na |
| Carbon monoxide (CO) | Protection of Human Health | Maximum daily 8-hour mean | 10,000 | | 10,000 | na |
| | | 1 day | na | 4,000 | na | not to be exceeded more than 18 times per calendar year |
| Lead (Pb) | Protection of Human Health | Calendar year | 0.5 | na | na | na |

The limit values of the CAFE Directive are set out in **Table 18.2**. Limit values are presented in micrograms per cubic metre (μg/m$^3$) and parts per billion (ppb). The notation $PM_{10}$ is used to describe particulate matter or particles of ten micrometres or less in aerodynamic diameter. $PM_{2.5}$ represents particles measuring less than 2.5 micrometres in aerodynamic diameter.

**Table 18.2: Limit values of CAFE Directive 2008/50/EC (Source: EPA 11/11/2023)**

| Pollutant | Limit Value Objective | Averaging Period | Limit Value to be attained by 2030 (μg/m$^3$) | Limit Value to be attained by 20 (μg/m$^3$) | Basis of Application of Limit Value |
|---|---|---|---|---|---|
| Sulphur Dioxide ($SO_2$) | Protection of human health | 1 hour | 350 | 132 | Not to be exceeded more than 24 times in a calendar year |
| Sulphur Dioxide ($SO_2$) | Protection of human health | 24 hours | 125 | 47 | Not to be exceeded more than 3 times in a calendar year |
| Sulphur Dioxide ($SO_2$) | Protection of vegetation | Calendar Year | 20 | 7.5 | Annual mean |
| Sulphur Dioxide ($SO_2$) | Protection of vegetation | 1 Oct to 31 Mar | 20 | 7.5 | Winter mean |
| Nitrogen dioxide ($NO_2$) | Protection of human health | 1 hour | 200 | 105 | Not to be exceeded more than 18 times in a calendar year |
| Nitrogen dioxide ($NO_2$) | Protection of human health | Calendar Year | 40 | 21 | Annual mean |
| Nitric oxide (NO) + Nitrogen dioxide ($NO_2$) | Protection of ecosystems | Calendar Year | 30 | 16 | Annual mean |
| $PM_{10}$ | Protection of human health | 24 hours | 50 | - | Not to be exceeded more than 35 times in a calendar year |

| Pollutant | Limit Value Objective | Averaging Period | Limit Value to be attained by 2030 (µg/m$^3$) | Limit Value to be attained by 20 (µg/m$^3$) | Basis of Application of Limit Value |
|---|---|---|---|---|---|
| $PM_{10}$ | Protection of human health | Calendar Year | 40 | - | Annual mean |
| $PM_{2.5}$ - Stage 1 | Protection of human health | Calendar Year | 25 | - | Annual mean |
| $PM_{2.5}$ - Stage 2 | Protection of human health | Calendar year | 20 | - | Annual mean |
| Lead (Pb) | Protection of human health | Calendar year | 0.5 | - | Annual mean |
| Carbon Monoxide (CO) | Protection of human health | 8 hours | 10,000 | 8620 | Not to be exceeded |
| Benzene ($C_6H_6$) | Protection of human health | Calendar year | 5 | 1.5 | Annual mean |

**Table 18.3** presents the limit and target values for ozone as per the Ambient Air Quality and CAFE Directive (2008/50/EC).

**Table 18.3: Target values for Ozone Defined in Directive 2008/50/EC**

| Objective | Parameter | Target Value from 2010 | Target Value from 2020 onwards |
|---|---|---|---|
| Protection of human health | Maximum daily 8- hour mean | 120 µg /m$^3$ not to be exceeded more than 25 days per calendar year averaged over 3 years | 120 µg /m$^3$ |
| Protection of vegetation | *$AOT_{40}$ calculated from 1 hour values from May to July | 18,000 µg /m$^3$ h$^{-1}$ averaged over 5 years | 6,000 µg /m$^3$ h$^{-1}$ |
| Information Threshold | 1-hour average | 180 µg /m$^3$ | 180 µg /m$^3$ |
| Alert Threshold | 1-hour average | 240 µg /m$^3$ | 240 µg /m$^3$ |

*$AOT_{40}$ is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80 µg/m$^3$ and is expressed as µg/m$^3$ hours.

### 18.2.2 Air Quality & Health

Environmental Protection Agency (EPA, 2020)[13], European Environmental Protection Agency (EEA, 2024)[14] and World Health Organisation (WHO, 2014) reports estimate that poor air quality accounted for premature deaths of approximately 600,000 people in Europe in 2012, with 1,300 Irish deaths predominantly due to fine particulate matter ($PM_{2.5}$) in 2020 and 30 Irish deaths attributable to Ozone ($O_3$) in 2016[15&16]. Air pollution concentration in 2021 remained well above the levels recommend by the World Health Organization (WHO). The most recent EEA study (2024) of air pollution across Europe has shown in 2022, European citizens remained exposed to air pollutant concentrations that were considerably above the levels recommended by the World Health Organization (WHO). Reducing air pollution to these WHO guideline levels would prevent a significant number of annual deaths in EU Member States (EU-27): 239,000 from exposure to fine particulate matter ($PM_{2.5}$); 70,000 from exposure to ozone ($O_3$) and 48,000 from exposure to nitrogen dioxide ($NO_2$).

[13] Environmental Protection Agency, (2020). Ireland's Environment 2020 – An Integrated Assessment. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/EPA_Irelands_Environment_2020.pdf [Accessed 26th February 2026].
[14] European Environment Agency, (2024). Harm to human health from air pollution in Europe: burden of disease status. Available at: https://www.eea.europa.eu/en/analysis/publications/harm-to-human-health-from-air-pollution-2024 [Accessed 26th February 2026]. (
[15]World Health Organization, (2014). Almost 600,000 deaths due to air pollution in Europe – new WHO global report. Available at: https://www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2014/03/almost-600-000-deaths-due-to-air-pollution-in-europe-new-who-global-report [Accessed 26th February 2026].
[16]Environmental Protection Agency, (2016). Ireland's Environment 2016 – An Assessment. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/SoE_Report_2016-1.pdf [Accessed 26th February 2026].

Air quality in Ireland is generally good and was compliant with 2024 air quality standards, meeting all EU legal requirements. However, Ireland is not yet meeting the stricter health guidelines from the WHO and are falling behind on targets set in Ireland's Clean Air Strategy for 2026 (Department of Climate, Energy and the Environment (DCEE), 2023) [17].

The Clean Air Strategy for Ireland – Progress Report 2025[18], published by the DECC, outlines the country's progress in improving air quality since the strategy's launch in 2023. It highlights significant achievements, including compliance with EU targets for key pollutants such as ammonia ($NH_3$) and sulphur dioxide ($SO_2$), largely due to improved agricultural practices and reduced fossil fuel use. Ambient air quality has improved nationwide, with fewer monitoring stations exceeding WHO guideline levels. However, challenges remain in urban transport and residential emissions, prompting targeted pilot projects and legislative updates. The report also details enhanced public engagement through new platforms like cleanair.ie[19], citizen science initiatives, and strategic communication efforts.

The revised EU Ambient Air Quality Directive is required to be transposed into Irish legislation by 2026, this revised directive aims to align EU air quality standards with WHO guidelines to reduce premature deaths from air pollution by 55% by 2030.

Ireland faces significant challenges in meeting updated EU targets, with projected compliance levels of only 93% for fine particulates matter (PM2.5) and 78%for nitrogen dioxide ($NO_2$.

Fine particulate matter, ozone, along with others including carbon dioxide ($CO_2$), nitrogen oxides ($NO_x$) and sulphur oxides ($SO_x$) are produced during the burning of fossil fuels for energy generation, transport or home heating. There are no such emissions associated with the operation of wind turbines. Therefore, wind turbines such as in the Project will result in lower environmental levels of such parameters, and consequential beneficial effects on human health, as the renewable electricity generated by the Project will offset the otherwise generated electricity from combustion of fossil fuels.

### 18.2.3 Air Quality Zones

The EPA has designated four Air Quality Zones for Ireland:

[17] Department of Climate, Energy and the Environment, (2025). Clean Air Strategy Progress Report 2025. Available at: https://assets.gov.ie/static/documents/2025_06_17_CAS_Progress_Report.pdf [Accessed 26th February 2026].
[18] Department of Climate, Energy and the Environment, (2025). Clean Air Strategy Progress Report 2025. Available at: https://assets.gov.ie/static/documents/2025_06_17_CAS_Progress_Report.pdf [Accessed 26th February 2026].
[19] Clean Air Website. Available at: https://cleanair.ie/ [Accessed 26th February 2026].

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

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the CAFE Directive. The Project lies within Zone D, which represents rural areas located away from large population centres.

### 18.2.4 Existing Air Quality Conditions

#### *18.2.4.1 Existing Air Quality Conditions in Ireland*

Generally, Ireland is recognised as having some of the best air quality in Europe. However, from time to time, and under certain weather conditions, it is possible to experience some air pollution in the larger towns and cities. The most recent published report on air quality in Ireland is the 'Air Quality in Ireland 2024' report published by the EPA in (September) 2025[20]. This report provides an overview of the ambient air quality in Ireland in 2024. It is based on monitoring data from 115 stations across Ireland. The measured concentrations are compared with both EU legislative standards and WHO air quality guidelines for a range of air pollutants.

Results from the monitoring campaign across Ireland during 2024 show:

- No levels above the EU limit value (CAFE Directive), as shown in **Table 18.2,** were recorded at any of the ambient air quality network monitoring sites in Ireland in 2024.

WHO guideline values were exceeded at a number of monitoring sites for fine particulate matter ($PM_{2.5}$) and ($PM_{10}$), ozone ($O_3$), nitrogen dioxide ($NO_2$). WHO guideline values for sulphur dioxide ($SO_2$) were exceeded at two monitoring stations.

#### *18.2.4.2 Existing Air Quality Conditions Locally*

The closest monitoring site (National Network) to the Project, within the same air quality zone, is located at Roscommon Town, Co. Roscommon, approximately 25.71km south-east of the Wind Farm Site:

- In Roscommon, the mean guidelines for $PM_{2.5}$ and $PM_{10}$ were not breeched on any day in 2024.

[20] EPA (2025), Air Quality in Ireland 2024. Available at: https://www.epa.ie/publications/monitoring--assessment/air/EPA-Air-Quality-in-Ireland-Report-2024-INTERACTIVE.pdf

- The annual mean $PM_{10}$ and $PM_{2.5}$ levels for Roscommon were 10.2 µg/m³ and 6.6 µg/m³, respectively, both below the limit values set out by Directive 2008/50/EC; See **Table 18.1.**

## 18.2.5 Do Nothing Impact

If the Project was not to proceed, the opportunity to reduce emissions of carbon dioxide ($CO_2$), nitrogen oxides ($NO_x$), and sulphur dioxide ($SO_2$) to the atmosphere would be lost due to the continued dependence on electricity derived from coal, oil, peat and gas-fired power stations, rather than renewable energy sources such as the Project. This would result in an indirect, negative effect on air quality. There would be no likely significant effect on air quality.

## 18.2.6 Potential effects of the Project

### *18.2.6.1 Construction Phase*

During the construction phase standard methodologies are being used given known ground conditions and soil stability. These standard methodologies are described and assessed.

#### 18.2.6.1.1 Dust Emissions

The main potential source of effects on air quality during construction is dust. There is potential for the generation of dust from excavations and from construction including construction of Site Access Roads, Turbine Hardstands and the trenches for the cable ducting for the Grid Connection.

The potential for dust to cause disturbance is dependent on the terrain, weather conditions, (i.e., dry and windy conditions), and the proximity of receptors. Dust from cement can cause ecological damage if allowed to migrate to water courses, however ready-mix concrete will be used with no on-site batching taking place. Therefore, this will not be a potential source of emissions. Potentially dust generating activities are as follows:

- Earth moving and excavation plant and equipment for handling and storage of soils and subsoils.
- Transport and unloading of stone materials for Site Access Road construction.
- Vehicle movements over dry surfaces such as Site Access Roads and public roads.

The potential effect from dust becoming friable and to cause disturbance to workers and local road users, if unmitigated, is considered, a slight, negative, short-term, direct effect during the construction phase based on the UK IAQM 2024 guidance[21] which is considered best practice in Ireland. There are no likely significant effects from dust.

Friable dust cannot remain airborne for a very long time. The distance it can travel depends on the particle sizes, disturbance activities and weather conditions. Larger dust particles tend to travel shorter distances than smaller particles. Particle sizes greater than 30μm will generally deposit within approximately 100m of its source, while particles between 10-30μm travel up to approximately 250-500m and particle sizes of less than 10μm can travel up to approximately 1km[22].

Generally, (depending on the conditions outlined), dust disturbance is most likely to occur at sensitive receptors within approximately 250m (IAQM, 2024) of the source of the dust. It is considered that the principal sites of friable dust generation will be the Turbine Foundations and Turbine Hardstands, and also along new Site Access Roads. All Wind Turbines are situated greater than 740m away from inhabited dwelling houses. Therefore, these principal source sites of dust generation are greater than 250m distant from these sensitive receptors (**Figure 1.3**).

In addition, vegetation such as trees and hedgerows in the vicinity will help to mitigate any airborne dust migrating off the Wind Farm Site as outlined in IAQM 2024. Any effects of dust on vegetation will mostly be confined to the construction and will be short-term, slight, negative and not significant effect.

If unmitigated, there may also be dust deposition arising from mud on public roads, resulting from traffic leaving the construction Wind Farm Site. Effects from dust deposition at sensitive receptors would give rise to disturbance issues for residents of those properties. The effect would be short-term, temporary and slight negative and not sensitive on sensitive receptors.

There is no likely significant effect on air quality from an increase of dust emissions during the construction phase.

[21] Institute of Air Quality Management, (2024). Guidance on the assessment of dust from demolition and construction. Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf [Accessed 26th February 2026].
[22] Department of the Environment, Transport and the Regions, (2000). Controlling and mitigating the environmental effects of minerals extraction in England. Available at: https://cumbria.gov.uk/elibrary/Content/Internet/538/755/1929/17716/17720/17723/42130142312.PDF [Accessed 26th February 2026].

##### 18.2.6.1.2 Exhaust Emissions

Emissions from plant and machinery, including trucks, during the construction of the Project are a potential effect. The engines of these machines produce emissions such as carbon dioxide ($CO_2$), carbon monoxide (CO), nitrogen oxides ($NO_x$), and particulate matter ($PM_{10}$ and $PM_{2.5}$).

Particulate matter ("PM") less than ten micrometres in size ($PM_{10}$) can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. $PM_{10}$ arises from direct emissions of primary particulate such as black smoke and formation of secondary particulate matter in the atmosphere by reactions of gases such as sulphur dioxide ($SO_2$) and ammonia ($NH_3$). The main sources of primary $PM_{10}$ are incomplete burning of fossil fuels such as coal, oil and peat and emissions from road traffic, in particular diesel engines. Other sources of particulates include re-suspended dust from roads. Natural particulate matter includes sea-salt and organic materials such as pollens.

Nitrogen oxides ($NO_x$), include the two pollutants, nitric oxide (NO) and nitrogen dioxide ($NO_2$). Anthropogenic (human) activities such as power-generation plants and motor vehicles are the principal sources of nitrogen oxides through high temperature combustion. Nitrogen oxides are a significant air pollutant by themselves but can also react in the atmosphere to contribute to the formation of tropospheric ozone (ozone in the air we breathe) and acid rain. Short-term exposure to nitrogen dioxide is associated with reduced lung function and airway responsiveness, and increased reactivity to natural allergens. Long-term exposure is associated with increased risk of respiratory infection in children.

The construction phase is likely to result in an increase in exhaust emissions from construction vehicles and transport vehicles associated with the Project works. The impact on air quality from an increase in exhaust emissions will be a short-term, slight negative and not significant effect. There will be no likely significant effects on air quality from an increase in exhaust emissions during the construction phase.

#### *18.2.6.2 Operational Phase*

##### 18.2.6.2.1 Dust Emissions

During the operational phase, only a small number of light vehicles will access the Wind Farm Site, resulting in minimal and sporadic dust generation, similar to the movement of agricultural vehicles. Site visits are expected to occur approximately once or twice a week. In the unlikely event that a Wind Turbine or its components need to be replaced during the Project's lifetime, the traffic generated will be significantly lower than during the initial construction phase. In this case, there would only be one Wind Turbine delivered, compared to 11 No. Wind Turbines during the construction phase. The Site Access Roads and other infrastructure will already have been established at this stage. Therefore, the operational phase will have an imperceptible negative and not significant effect on air quality as a result of an increase in dust emissions during the operational phase.

##### 18.2.6.2.2 Exhaust Emissions

Exhaust emissions associated with the operational phase of the Project will arise from machinery use and Light-Good Vehicles (LGV) that are intermittently required onsite for maintenance works.

This will give rise to an imperceptible negative and not significant effect on air quality as a result of an increase in exhaust emissions during the operational phase.

##### 18.2.6.2.3 Wind Turbines

The Project, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, will result in emission savings of carbon dioxide ($CO_2$), oxides of nitrogen ($NO_x$), and sulphur dioxide ($SO_2$). The production of renewable energy from the Project will have a long-term, significant, positive effect on air quality. Further details on the carbon dioxide savings associated with the Project are presented in **Section 19.4.2.3** of **Chapter 19: Climate**.

#### *18.2.6.3 Decommissioning Phase*

Effects during the decommissioning phase of the Project are anticipated to be less than those arising during the construction phase. The Decommissioning phase will be as follows:

- Removal of 11 No. Wind Turbines;
- Removal of all associated underground electrical and communications cabling connecting the Wind Turbines to the Onsite Substation. Ducting is to remain *in-situ.*

All other elements of the Project will remain in-situ. The Site Access Roads, and associated drainage systems will also serve existing ongoing agricultural and commercial forestry activity in the area. All other hard surfaced areas will be allowed to revegetate naturally.

The decommissioning phase would be expected to last approximately 3-6 months, and any air quality effects from either dust or exhaust emissions would be predicted to be imperceptible.

### 18.2.7 Mitigation Measures and Residual Effects

#### *18.2.7.1 Construction Phase Mitigation*

The main potential effect during the construction phase of the Project will be from the potential for dust to cause disturbance at sensitive receptors close to the Wind Farm Site. The contractor will be contractually required to follow best practice construction procedures to prevent dirt and dust being transported onto the local road network and to minimise vehicle exhaust emissions. All mitigation measures detailed and assessed in this EIAR and outlined in the CEMP (**Appendix 2.1**) will be implemented on the Wind Farm Site. Best practice site control measures will comprise the following:

- Site Access Roads will be upgraded and constructed during the initial phases. These tracks will be surfaced with graded aggregate, which compacts to reduce dust generation.
- Approach roads and construction areas will be regularly monitored and maintained, including routine sweeping and cleaning, to prevent the buildup of mud. This will help prevent mud from migrating around the Wind Farm Site, onto the public road network, and into roadside drains. Wheel wash facilities will be provided, managed, and maintained near the site entrances to prevent mud and dirt from being transferred onto the public road network. The wheel wash will be located outside the 50m watercourse buffer zone, as outlined in **Appendix 2.1, CEMP Section 3.5.1.**
- Public roads along the construction haul routes will be inspected and cleaned daily. In the unlikely event that dirt/mud is identified on public roads, the roads will be cleaned. The wheel wash facility will be investigated and the problem fixed to prevent this from happening again.
- During periods of dry and windy weather, there is potential for dust to become friable and cause disturbance to nearby residences and users of the local road network. This requires wetting material and ensuring water is supplied at the correct levels for the duration of the work activity. The weather will be monitored so that the need for damping down activities can be predicted. Water bowsers will be available to spray work areas (Turbine Hardstand areas and Grid Connection route) and Construction Haul Routes roads to suppress dust migration from the Project. See **Appendix 2.1 CEMP Section 3.5.1**
- Vehicles delivering materials to the Wind Farm Site will be covered appropriately when transporting materials that could result in dust, e.g., crushed rock or sand.
- Exhaust emissions from vehicles operating within the Wind Farm Site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery.

- All machinery when not in use will be turned off and stored in a secure, bunded location (e.g. construction compound).
- Ready-mix concrete will be delivered to the Wind Farm Site; no batching of concrete will be permitted within the Wind Farm Site. Only washing out of chutes will take place and this will be undertaken at a designated concrete washout facility at the contractor's Temporary Construction Compounds see **Appendix 2.1 CEMP Section 3.5.1**. The concrete washout facility is a lined containment system designed to prevent run-off into soil, surface water or groundwater.
- Speed restrictions of 15 km/h on Site Access Roads will be implemented to reduce the likelihood of dust becoming airborne. Consideration will be given to how speed limits are policed by the Contractor and referred to in the toolbox talks.
- Good practice will be applied, and care will be taken with stockpiled materials to minimise their exposure to wind; stockpiles will be covered with geotextiles layering and damping down will be carried out when weather conditions require it.
- Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable.
- An independent, qualified Geotechnical Engineer will be contracted for the detailed design stage of the Project and geotechnical services and will be retained throughout the construction phase, including monitoring and supervision of construction activities on a regular basis. The methodology statement will be signed off by a suitably qualified Geotechnical Engineer.
- A complaints procedure will be implemented on Wind Farm Site where complaints will be reported, logged and appropriate action taken.

#### *18.2.7.2 Operational Phase Mitigation*

As the operation of the Project will have positive impact on air quality, mitigation measures are considered unnecessary. Where Wind Turbine components are being replaced, or other scheduled or unscheduled maintenance activities occur on the Wind Farm Site, the same mitigation measures as per the construction phase will apply.

#### *18.2.7.3 Decommissioning Phase Mitigation*

Mitigation measures during the Decommissioning phase will be similar to those employed during the construction phase as outlined above.

### 18.2.8 Cumulative Effects

**Table 2.1** in **Chapter 2: Project Description (Section 2.3.3)** outlines the existing and proposed wind farms within 20km of the Wind Farm Site.

There are 4 No. proposed (not yet built) and 3 operational wind farms located between 6.8km and 19.4km) from the Project. Given the distances from the Wind Farm Site, they are not in the zone of influence (>350m) of the Project. Even if construction of these wind energy developments takes place at the same time as construction of the Project, given the distances from the Wind Farm Site, there would not be any cumulative air quality effects.

The Roscommon Council Planning portal was accessed to check planning permissions granted within a 10km radius of the Project and other major development or proposed developments (larger than a one-off house) are summarised in **Appendix 2.4**.

Much of the non-wind energy planning permissions relate to (see **Appendix 2.4**)

- Agricultural buildings
- Retail buildings
- Residential developments
- Community improvements

In terms of their scale, it is considered that the construction and use of the agricultural buildings would only have a negligible to minor localised impact on air quality should their construction and operational use be concurrent with the Project as none are located close to the Project.

During the operational phase emissions of carbon dioxide ($CO_2$), nitrogen oxides ($NO_x$), and sulphur dioxide ($SO_2$) or dust emissions from the Project and other developments listed in **Appendix 2.4**, will result from the operation and maintenance vehicles on the respective sites. However, these emissions will be minimal and will be offset by the Project through displacing associated emissions of greenhouse gases from electricity generated with fossil fuels with clean renewable energy. Therefore, there will be a long-term imperceptible negative cumulative impact on air quality.

The nature of the Project and other renewable energy developments within 20 km are such that, once operational, they will have a cumulative long-term, significant, positive effect on air quality.

### 18.2.9 Residual Effects of the Project

The use of plant and machinery during the construction phase is not likely to have a significant impact on air quality in the area, both in terms of dust generation and exhaust emissions. Overall, with mitigation in place this effect is assessed as **slight/imperceptible**, **negative, direct** and **temporary/short-term** in nature.

During the operational phase of the Project exhaust emissions will arise from occasional machinery use and Light-Good Vehicles (LGV) that will be required for occasional on-site maintenance works. The effects will be long-term imperceptible and negative.

The wind energy created by the Project will displace the production of electricity from coal, oil, peat or gas-fired power stations resulting in emission savings of carbon dioxide ($CO_2$), nitrogen oxides ($NO_x$), and sulphur dioxide ($SO_2$). This will lead to a **long-term significant positive** effect on air quality. **Section 19.4.2** of **Chapter 19: Climate** details the calculated carbon dioxide and combustion savings in greater detail.

The Decommissioning phase, and consequential effects will be similar to the construction stage, albeit of less effect as the works required will be less as described in **Chapter 2: Project Description**. For example, the Turbine Foundations will remain in-situ, covered with earth and reseeded as appropriate. The Onsite Substation building will also be left in-situ. This means there will be no additional excavation works required for the Decommissioning of these infrastructure components. Therefore, no additional truck movements are required for the demolition and removal of this infrastructure. The mitigation measures outlined for the construction phase of the Project will be implemented during the Decommissioning phase thereby minimising any potential effects. Overall, with mitigation in place this Decommissioning phase effect is assessed as **slight/imperceptible**, **negative, direct** and **temporary/short-term** in nature.

### 18.2.10 Summary of Significant Effects

This assessment has identified no potentially significant negative effects, given the mitigation measures embedded in the design which will be implemented in the Project. Once operational, the Project will have a slight, positive, long-term effect on air quality. Under a cumulative scenario, the Project will have a cumulative long-term, significant, positive effect on air quality.

### 18.2.11 Statement of Significance

The significance of potential effects of the Project on air quality has been assessed as having the potential to result in **slight, negative** and temporary/short-term effects on air Quality during construction and decommissioning. There will be no significant effect on air quality during construction and decommissioning.

The avoidance of the production of electricity from coal, oil, peat or gas-fired power stations, will lead to a **slight, positive** and **long-term** effect on air quality during the operation phase.

The Project has been assessed as having no significant direct or indirect effects on air quality during the construction, operation or decommissioning phases of the Project.

Potential cumulative effects were assessed as having a **cumulative long-term, significant, positive** effect on air quality.