10. AIR QUALITY

10.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) identifies, describes and assesses the potential effects of the Prospective Development on air quality and has been completed in accordance with the Environmental Impact Assessment (EIA) guidance and legislation set out in Chapter 1: Introduction. The full description of the Prospective Development is provided in Chapter 4 of this EIAR.

As detailed in Section 1.1.1 in Chapter 1 of this EIAR/rEIAR, the various development components are described and assessed using the following references: 'Subject Development', 'Existing Development', 'Prospective Development', 'Permitted Development', 'Site', 'Wind Farm Site', 'Grid Connection Site', 'BMEP Site', 'Grid Connection', ' November 2020 Peat Slide', '2017 EIAR' and 'proposed turbines' or 'proposed turbine locations'.

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on air quality arising from the construction, operation and decommissioning of the Prospective Development. Alternative scenarios proposed for the Prospective Development and their potential for effects on air quality are considered in EIAR Chapter 3: Consideration of Reasonable Alternatives.

The assessment has been carried out according to best practice and guidelines relating to air quality.

10.1.1 Statement of Authority

This section of the EIAR has been prepared by Karen O'Neill and Robert Kennedy, and was reviewed by Sean Creedon, all of MKO.

Karen O'Neill is a Project Environmental Scientist with MKO with over 5 years of experience in private consultancy. Karen holds a BA (Joint Hons) in Geography and Archaeology, and a MSc (Hons) in Environmental Science where she focused her studies on environmental and planning policy. Karen's key strengths and expertise are project management, report writing and review, and preparation of Environmental Impact Assessment Reports. Through previous roles, Karen has been involved as part of the project delivery team for a range of renewable energy infrastructure projects, including onshore and offshore wind energy developments, and multifaceted projects comprising wind energy, solar energy, battery storage and associated electrical infrastructure. Responsibilities for same included feasibility and constraints analysis, project management, draft and review of various EIAR chapters, mapping, and engagement with stakeholders.

Robert is a Project Environmental Scientist working as part of MKO's Renewables Team. Having joined the company in June 2022, Robert has over 4 years' experience in renewable energy consulting. Robert holds a BSc in Environmental Biology and an MSc in Environmental Policy, both from University College Dublin. Robert's key strengths and areas of expertise are in project management, environmental impact assessment reporting, renewable energy, report writing, and research. Since joining MKO, Robert has worked with and coordinated large multi-disciplinary teams involved in the production of EIARs for large-scale renewable energy developments. Robert's experience spans a broad range of wind energy developments, including applications for new onshore and offshore wind farms, repowering and lifetime extension projects, and substitute consent. Robert also played a role in developing MKO's new service offering around Biodiversity Net Gain and other nature-positive mechanisms.

Sean Creedon is an Associate Director in the Environment Team at MKO. He is a member of the MKO senior management team and leads a team of highly skilled environmental professionals working

on EIAR for large-and medium scale Renewable Energy infrastructure. Over a 24-year period, Sean has overseen and directed the submission of range of large and medium scale renewable energy planning applications for wind (offshore and onshore), solar, battery, biogas and hydrogen developments, as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. Sean's professional experience includes the development and management of a portfolio of wind farm developments to the consenting decision. Sean holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

10.1.2 Background

The Wind Farm Site is located within a rural, agricultural setting in County Donegal approximately 8 km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12 km northeast of Donegal Town at its nearest point. The Grid Connection Site extends southwest from the Wind Farm Site for approximately 6 km along the N15 National Road towards Donegal Town before exiting the N15 to the southeast and following Local Roads, adjacent agricultural land and private access track to the Clogher 110kV substation. The BMEP Site is comprised of two parcels of land consisting of coniferous forestry and associated forestry access tracks. The BMEP Site is located in the townland of Tievecloghoge and comprises two land parcels, referred to as Parcel 1 (to the east) and Parcel 2 (to the west). Parcel 2 is located approximately 2.3km east of the Wind Farm Site, and Parcel 1 is located approximately 4.2km east of the Wind Farm Site.

Due to the non-industrial nature of the Subject Development and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR. It is considered that air quality in the existing environment is reflective of the Environmental Protection Agency's (EPA) Air Quality Zone D, as described in Section 10.1.8.1 below, since there are no major sources of air pollution (e.g., heavy industry) in the vicinity of the Site.

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

10.1.3 Scoping and Consultation

The scope for this assessment has been informed by consultation with statutory and non-statutory bodies and other interested parties as summarised in Section 2.9 of Chapter 2 of this rEIAR. Scoping requests made and received in relation to Air Quality are discussed in Table 10-1 below.

Table 10-1: Scoping and Consultation Requests and Responses relevant to Air Quality

Consultee	Description	Addressed in Section
Environmental Protection Agency (EPA)	A scoping request was issued to the EPA in September 2025. No response has been received to date.	N/A
Health Service Executive (HSE)	*'Air quality due to the nature of the proposed construction works generation of airborne dust has the potential to have significant impacts on sensitive receptors. A Construction Environmental Management Plan(CEMP) should*	Sections 10.3.2.3, 10.3.2.4 and Section 10.3.3.2 detail the dust suppression measures that will be employed at the Site during the construction and operational phases of the Prospective Development. These measures are

	be included in the EIAR which details dust control and mitigation measures'.	also detailed in the CEMP for the Prospective Development (Appendix 4-3), which outlines the mitigation and monitoring measures that will be implemented on site during construction of the Prospective Development.
Department of Health Northern Ireland	A scoping request was issued to the Department of Health Northern Ireland in September 2025. No response has been received to date.	N/A

10.1.4 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the Air Quality Chapter of this EIAR.

10.1.5 Relevant Legislation

In 1996, the Air Quality Framework Directive (on ambient air quality assessment and management) (96/62/EC)[1] was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC)[2] addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC)[3] addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- The third Daughter Directive, Council Directive (2002/3/EC)[4] relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive (2004/107/EC)[5], published in 2004, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009) (amended by SI 659/2016 - Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016.)

[1] *Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management* <https://eur-lex.europa.eu/eli/dir/1996/62/oj/engEuropean Environment Agency+2>
[2] *Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air* <https://eur-lex.europa.eu/eli/dir/1999/30/oj/eng>
[3] *Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air* <https://eur-lex.europa.eu/eli/dir/2000/69/oj/eng>
[4] *Directive 2002/3/EC of the European Parliament and of the Council of 12 February 2002 relating to ozone in ambient air* <https://eur-lex.europa.eu/eli/dir/2002/3/oj/eng>
[5] *Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air* <https://eur-lex.europa.eu/eli/dir/2004/107/oj/eng>

The Air Quality Framework Directive and the first three Daughter Directives were replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC[6] on ambient air quality and cleaner air for Europe) (as amended by Directive EU 2015/1480)[7] which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for PM2.5 (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM10) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 10-2 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. 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.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended by the Air Quality Standards (Amendments) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016). The 2011 Regulations superseded the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999). The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) was revoked on 31 December 2022 and has been replaced by the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022).

On the 26th of October 2022 the EU Commission announced a proposed review of Air Quality Standards.[8] The proposed revision will set interim 2030 EU air quality standards, seeking to align more closely with WHO recommendations, while putting the EU on a trajectory to achieve zero pollution for air at the latest by 2050, in synergy with climate-neutrality efforts. The first review is proposed to take place by the end of 2028, with the objective of ensuring full alignment with WHO recommendations.

The Ambient Air Quality Standards Regulation (2022) made the provisions necessary for the implementation of Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe (as amended), establishes the limit values and alert thresholds for concentrations of certain pollutants in ambient air, provides for the assessment of concentrations of certain pollutants in ambient air, provides for the maintenance of ambient air quality, and ensures that adequate information on concentrations of pollutants are made available to the public.

On 10th December 2024, Directive (EU) 2024/2881 on ambient air quality and cleaner air for Europe came into force. This directive recasts Directive 2008/50/EC (the CAFE Directive) and the fourth Daughter Directive (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air) and incorporates them into a single directive. This recast directive sets out limit values, target values, average exposure reduction obligations, average exposure concentration objectives, critical levels, alert thresholds, information thresholds and long-term

[6] *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* <https://eur-lex.europa.eu/eli/dir/2008/50/oj/eng>
[7] *Commission Directive (EU) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC* <https://eur-lex.europa.eu/eli/dir/2015/1480/oj/engEUR-Lex+1FAOHome+1>

[8] *European Commission, Revision of the Ambient Air Quality Directives.* <https://environment.ec.europa.eu/topics/air/air-quality/revision-ambient-air-quality-directives_en>

objectives. It sets out air quality provisions with the aim of achieving the objectives of the European Commission's Zero Pollution Action Plan, so that air pollution within the EU is progressively reduced to levels no longer considered harmful to health and natural ecosystems at the latest by 2050. Member States must transpose this Directive into national law by the 11th December 2026. At the time of writing Directive (EU) 2024/2881 has not yet been transposed into Irish law.

10.1.6 Relevant Guidance

The air quality section of this EIAR is carried out in accordance with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU and having regard, where relevant, to guidance listed below:

- DEFRA (2018) Part IV of the Environment Act 1995: Local Air Quality Management Technical Guidance LAQM.TG(16).[9]
- Environmental Protection Agency (EPA) (2021) Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects.[10]
  EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports[11].
- EPA (2024) Air Quality in Ireland Report 2023.[12]
- EPA (2025) Air Quality in Ireland Report 2024.[13]
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report.[14]
- European Environment Agency (EEA) (2022) Air Quality in Europe 2022.[15]
- European Environment Agency (EEA) (2025) Air Quality Status Report 2025.[16]
- Government of Ireland (2023) Clean Air Strategy for Ireland.[17]
- Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction, Version 2.2.[18]
- Transport Infrastructure Ireland (TII) (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes.[19]
- Transport Infrastructure Ireland (TII) (2022) Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107.[20]
- UK National Highways (2024) Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality (Version 0.1.0).[21]

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[9] *Department for Environment, Food and Rural Affairs (DEFRA). (2018). Local Air Quality Management Technical Guidance (LAQM.TG(16)). https://laqm.defra.gov.uk/air-quality/featured/technical-guidance/*
[10] *Environmental Protection Agency (EPA). (2021). Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects. https://www.epa.ie/publications/circular-economy/resources/best-practice-guidelines-for-the-preparation-of-resource–waste-management-plans-for-construction–demolition-projects.php*
[11] *Environmental Protection Agency (EPA). (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. June 2022. https://www.epa.ie/publications/monitoring–assessment/assessment/EIAR_Guidelines_2022_Web.pdf*
[12] *Environmental Protection Agency (EPA). (2024). Air Quality in Ireland 2023.*
[13] *Environmental Protection Agency (EPA). (2025). Air Quality in Ireland 2024. https://www.epa.ie/publications/monitoring–assessment/air/air-quality-in-ireland-2024.php*
[14] *European Commission (EC). (2017). Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report. https://albertslund.dk/media/4wyitnqv/eu_2017_environmental-impact-assessment-of-projects-guidance-on-the-preparation-of-the-environmental-impact-assessment-repo.pdf*
[15] *Quality in Europe 2022 (EEA) (2022) https://www.eea.europa.eu/en/analysis/publications/air-quality-in-europe-2022*
[16] *Air Quality Status Report 2025 (EEA, 2025) https://www.eea.europa.eu/en/analysis/publications/air-quality-status-report-2025*
[17] *Government of Ireland (2023) Clean Air Strategy for Ireland https://assets.gov.ie/static/documents/clean-air-strategy.pdf*
[18] *Guidance of the Assessment of Dust from Demolition and Construction (IAQM, 2024) https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf*
[19] *Transport Infrastructure Ireland (TII) (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes.https://www.tii.ie/media/kzldoawo/guidelines-for-assessment-of-ecological-impacts-of-national-road-schemes.pdf*
[20] *Transport Infrastructure Ireland (TII) (2022) Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107. https://cdn.tii.ie/publications/PE-ENV-01107-01.pdf*
[21] *UK National Highways (2024) Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality (Version 0.1.0). https://standardsforhighways.co.uk/search/html/af7f4cda-08f7-4f16-a89f-e30da703f3f4?standard=DMRB*

- World Health Organization (WHO) (2021) WHO Global Air Quality Guidelines for Particulate Matter ($PM_{2.5}$ and PM_{10}), Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide.[22]

10.1.7 Air Quality Standards

The recently implemented Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022) remains aligned to the CAFÉ Directive and diverts to the CAFÉ Directive for the Limit values outlined in Table 10-2, the Assessment Thresholds in Table 10-3, the Ozone limits and Assessment Thresholds in Table 10-4 and Table 10-5 respectively.

Table 10-2 Limit Values of the CAFÉ Directive 2008/50/EC (Source: https://airquality.ie/information/air-quality-standards)

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m3)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of human health	1 hour	350	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of human health	24 hours	125	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	Annual mean	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	Annual mean	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of ecosystems	Calendar year	30	Annual mean	19th Jul 2001
Particulate matter 10 (PM_{10})	Protection of human health	24 hours	50	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005

[22] *WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. https://www.who.int/publications/i/item/9789240034228*

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m3)	Basis of Application of Limit Value	Attainment Date
Particulate matter 10 (PM_{10})	Protection of human health	Calendar year	40	Annual mean	1st Jan 2005
Particulate matter 2.5 ($PM_{2.5}$) Stage 1	Protection of human health	Calendar year	25	Annual mean	1st Jan 2015
Particulate matter 2.5 ($PM_{2.5}$) Stage 2	Protection of human health	Calendar year	20	Annual mean	1st Jan 2020
Lead (Pb)	Protection of human health	calendar year	0.5	Annual mean	1st Jan 2005
Carbon Monoxide (CO)	Protection of human health	8 hours	10,000	Not to be exceeded	1st Jan 2005
Benzene (C_6H_6)	Protection of human health	calendar year	5	Annual mean	1st Jan 2010

Table 10-3 Assessment Thresholds from CAFE Directive 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
Sulphur dioxide (SO_2)	Upper assessment threshold for the protection of Human Health	24 hours	75	Not to be exceeded more than 3 times in a calendar year
Sulphur dioxide (SO_2)	Lower assessment threshold for the protection of human health	24 hours	50	Not to be exceeded more than 3 times in a calendar year
Nitrogen dioxide (NO_2)	Upper assessment threshold for the protection of human health	1 hour	140	Not to be exceeded more than 18 times in a calendar year
Nitrogen dioxide (NO_2)	Lower assessment threshold for the protection of human health	1 hour	100	Not to be exceeded more than 18 times in a calendar year
Particulate matter 10 (PM_{10})	Upper assessment threshold	24 hours	35	Not to be exceeded more than 35 times in a calendar year

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
Particulate matter 10 (PM_{10})	Lower assessment threshold	24 hours	25	Not to be exceeded more than 35 times in a calendar year
Lead (Pb)	Upper assessment threshold	Calendar Year	0.35	-
Lead (Pb)	Lower assessment threshold	Calendar Year	0.25	-
Carbon Monoxide (CO)	Upper assessment threshold	8 hours	7000	-
Carbon Monoxide (CO)	Lower assessment threshold	8 hours	5000	-
Benzene (C_6H_6)	Upper assessment threshold	Calendar Year	3.5	-
Benzene (C_6H_6)	Lower assessment threshold	Calendar Year	2	-

Ozone is set out differently in the CAFE Directive in that it sets target values and long-term objectives for ozone rather than limit values. Table 10-4 presents the target values and long-term target value for ozone and Table 10-5 details the threshold values for Ozone.

Table 10-4 Target values for Ozone defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Long- term Objective
Protection of human health	Maximum daily 8-hour mean	120 $\mu g/m^3$ not to be exceeded more than 25 days per calendar year averaged over 3 years	120 $\mu g/m^3$
Protection of vegetation	AOT40* calculated from 1-hour values from May to July	18,000 $\mu g/m^3.h$ averaged over 5 years	6,000 $\mu g/m^3.h$

* AOT40 is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80 µg/m3 and is expressed as µg/m3 hours.

Table 10-5 Threshold for Ozone Defined in Directive 2008/50/EC (source: https://airquality.ie/information/air-quality-standards and Directive 2008/50/EC)

Pollutant	Averaging Period	Threshold
Information Threshold	1-hour average	180 µg/m^3
Alert Threshold	1-hour average	240 µg/m^3

10.1.7.1 Air Quality and Health

In September 2025, the EPA published '*Air Quality in Ireland 2024*'[23] which reports that in 2024 Ireland met the current EU legal air quality limits. It is stated that the most significant pollutants in Ireland are Particulate Matter (PM) and Nitrogen Dioxide (NO_2). The main sources of these pollutants are the burning of solid fuel such as coal, peat, and wood to heat homes, and from traffic (petrol and diesel engines) in our towns, villages and cities. The report highlighted the unseen impacts air quality can have on health, linking approximately 1,700 premature deaths in Ireland each year due to cardiovascular and respiratory diseases. The report outlines that Ireland is not yet meeting the stricter health guidelines from the World Health Organization (WHO) and are falling behind on targets set in the Clean Air Strategy for Ireland out to 2026 (discussed below). Ireland's ambition in the 'Clean Air Strategy for Ireland' is to move towards alignment with the WHO Air Quality guidelines, this will be challenging but will have a significantly positive impact on health.

The European Environmental Agency (EEA) Report, '*Air Quality in Europe 2022*' report highlights the negative effects of air pollution on human health. The report assessed that poor air quality in Europe accounted for premature deaths of approximately 238,000 people in the 27 EU Member States in 2020[24]. In 2020 in the European Union, 96% of the urban population was exposed to levels of fine particulate matter above the health-based guideline level set by the World Health organisation. Furthermore, in 2020 damaging levels of nitrogen deposition to ecosystems were exceeding in 75% of the total ecosystems that are in the EU-27. This represents a fall of 12% since 2005. The estimated effects on the population in Europe of exposure to NO_2 and O_3 concentrations in 2020 were around 49,000 and 24,000 premature deaths, respectively. From this, 490 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 50 Irish deaths were attributable to nitrogen oxides (NO_2) and 70 Irish deaths were attributable to Ozone (O_3) (Source: *'Air Quality in Europe – 2022 Report'*, EEA, 2022)[25]. These figures are further informed by the EEA publication of 'Ireland – air pollution country fact sheet 2024' on 10th December 2024[26]. This states that 530 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 100 Irish deaths were attributable to nitrogen oxides (NO_2), and 240 Irish deaths were attributable to Ozone (O_3).

The Office of Energy Efficiency and Renewable Energy in the United States published an article on 21st August 2024 entitled '*How Wind Can help Us Breathe Easier*.'[27] This article details the CO_2 emissions from different energy sources over the entire lifespan of the technology. It was found that wind energy produces around 11 grams of CO2 per kilowatt-hour (g CO_2/kWh) of electricity generated, compared with about 980 g CO_2/kWh for coal and roughly 465 g CO_2/kWh for natural gas. That makes coal's carbon footprint almost 90 times larger than that of wind energy, and the footprint of natural gas more

[23] *Environmental Protection Agency: Air Quality in Ireland 2024. Available at: https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2024.php*
[24] *European Environment Agency. (2022). Air quality in Europe – 2022 report. <https://www.eea.europa.eu/publications/air-quality-in-europe-2022/>*
[25] *European Environment Agency (EEA). (2022). Air Quality in Europe – 2022 Report. <https://www.eea.europa.eu/publications/air-quality-in-europe-2022/>*
[26] *European Environment Agency (EEA). (2024). Ireland – Air Pollution Country Fact Sheet 2024. <https://www.eea.europa.eu/en/topics/in-depth/air-pollution/air-pollution-country-fact-sheets-2024/ireland-air-pollution-country-fact-sheet-2024>*
[27] *Office of Energy Efficiency and Renewable Energy (2024) How Wind Can Help Us Breathe Easier <https://www.energy.gov/eere/wind/articles/how-wind-can-help-us-breathe-easier>*

than 40 times larger. During combustion of high-emitting energy sources, other air pollutants, i.e., nitrogen oxides (NOx) and sulphur dioxide (SO_2), are also released into the atmosphere. This results in the emission of pollutants that can cause adverse health effects, including asthma, bronchitis, lower and upper respiratory symptoms, and heart attacks. Air pollution is responsible for a large number of premature deaths relating to these illnesses.

The EEA published a briefing on '*Europe's Air Quality Status*' in April 2025[28]. This briefing presented the status of concentrations of pollution in ambient air in 2022 and 2023 for regulated pollutants in relation to both EU air quality standards and the 2021 WHO guideline levels. The assessment shows that, in spite of constant improvements, exceedances of air quality standards are common across the EU, with concentrations well above the latest WHO recommendations. These emissions, along with others including sulphur oxides (SO_x) are produced during fossil fuel-based electricity generation in various amounts, depending on the fuel and technology used, emissions from industry and power plants, vehicles emissions and transport fuels.

More recently a few key messages are outlined in the '*Air Quality Status Report 2025'* published on April 9th, 2025, on the European Environment Agency web site[29]. These are:

- EU air quality standards are still not fully met across Europe, despite ongoing overall improvements.
- Since 2011, all countries have reduced exposure of their urban population to fine $PM_{2.5}$ particles, the most harmful pollutant from a health perspective. Nevertheless, the vast majority (94%) of the EU urban population remains exposed to $PM_{2.5}$ concentrations above the World Health Organization guideline level, highlighting the need for additional measures to reduce the associated health risks.
- Many locations already have air quality concentrations below the new EU 2030 standards. But in order to meet these new standards everywhere, and based on current progress, additional measures to improve air quality, especially in cities, are likely to be needed.

A 2024 EPA report *'Ireland's State of the Environment Report'* [30] states that the pollutants of most concern are Fine Particulate matter ($PM_{2.5}$.), Nitrogen Dioxide (NO_2) and Ammonia (NH_3). The EPA 2024 report goes on to state that:

> *"The planned transition to more renewable energy sources, and away from combustion-sourced heating systems to electrification, is a shift that could see greenhouse gas emissions from industry significantly decrease.*
>
> *As a consequence of meeting these growing demands primarily with oil, natural gas, coal and peat, our energy system is highly dependent on fossil fuels. Ireland has made some progress in transforming the electricity system through the deployment of wind farms, with renewable energy currently providing more than 40% of electricity used. However, electricity represents only one-fifth of Ireland's energy use, and our transport and heating systems remain heavily reliant on fossil fuel systems, with lock-ins that need to be addressed.*
>
> *While Ireland's renewable energy share has increased from 10.7% in 2018 (reported in the last State of the Environment Report) to 13.1% in 2022, this is the lowest level in the EU (well below the EU average of 23.0%), and Ireland is not on track to meet the EU-wide binding target of 42.5% renewable energy share by 2030. Reaching the target of 80% renewable*

[28] *Europe's air quality status 2024 briefing. <https://www.eea.europa.eu//publications/europes-air-quality-status-2024>*
[29] *European Environment Agency (EEA). (2025). Air Quality Status Report 2025. <https://www.eea.europa.eu/en/analysis/publications/air-quality-status-report-2025>*
[30] *Environmental Protection Agency (2024). Irelands State of the Environment Report 2024) <https://www.epa.ie/our-services/monitoring--assessment/assessment/irelands-environment/state-of-environment-report-/*

electricity by 2030, while ensuring a stable energy supply, will require new capacity, a more flexible grid and increased interconnectivity (EC, 2024)

Established technologies, such as wind energy, solar photovoltaics and bioenergy, will be key in meeting short-term emission reduction targets (i.e. 2030), whereas significant growth in offshore wind infrastructure is expected to be the key essential element of future energy systems."

The EPA also published a report in May 2025 providing details of emissions of air pollutants in Ireland in the period 1990 to 2023 and projected emissions of these pollutants for 2030[31]. The Key findings of the report with respect to assessment of targets are:

- Ireland is compliant with current and future emission reduction commitments for ammonia (NH3), non-methane volatile organic compounds (NMVOC), sulphur dioxide (SO2), nitrogen
- oxides (NOx) and fine particulate matter (PM2.5)
- Ammonia emissions are projected to be in compliance out to 2030
- An adjustment to NMVOC emissions is required in order to meet the required emission reduction commitment made in 2023.

The Prospective Development therefore represents an opportunity to further harness Ireland's significant renewable energy resources, with valuable benefits to air quality and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to the air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2), thereby resulting in cleaner air and associated positive health effects.

Whilst there is the potential of such emissions to be generated from the Prospective Development, mitigation measures will be implemented to reduce the impact from dust and vehicle emissions, which are discussed in Section 10.3 below.

Ireland's Clean Air Strategy 2023[32] sets out the detail of seven strategic frameworks that will be used to ensure that air quality continues to improve (Figure 10-1).The aims of these key strategic frameworks are:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country and to deliver health benefits for all.
- To ensure the integration of clean air considerations into policy development across Government.
- To increase the evidence base that will help Ireland to continue to evolve it's understanding of the sources of pollution and their impacts on health, in order to address them more effectively.
- To enhance regulation required to deliver improvements across all pollutants.
- To improve the effectiveness of our enforcement systems.
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

[31] *Environmental Protection Agency (EPA). (2025). Ireland's Air Pollutant Emissions 1990–2030.* <https://www.epa.ie/publications/monitoring–assessment/climate-change/air-emissions/EPA-Air-Pollutant-Final-Report.pdf>
[32] *Rialtas na hÉireann Clean Air Strategy April 2023. Available at:* https://www.gov.ie/en/publication/927e0-clean-air-strategy/#:~:text=The%20Clean%20Air%20Strategy%20provides,delivering%20on%20wider%20national%20objectives.

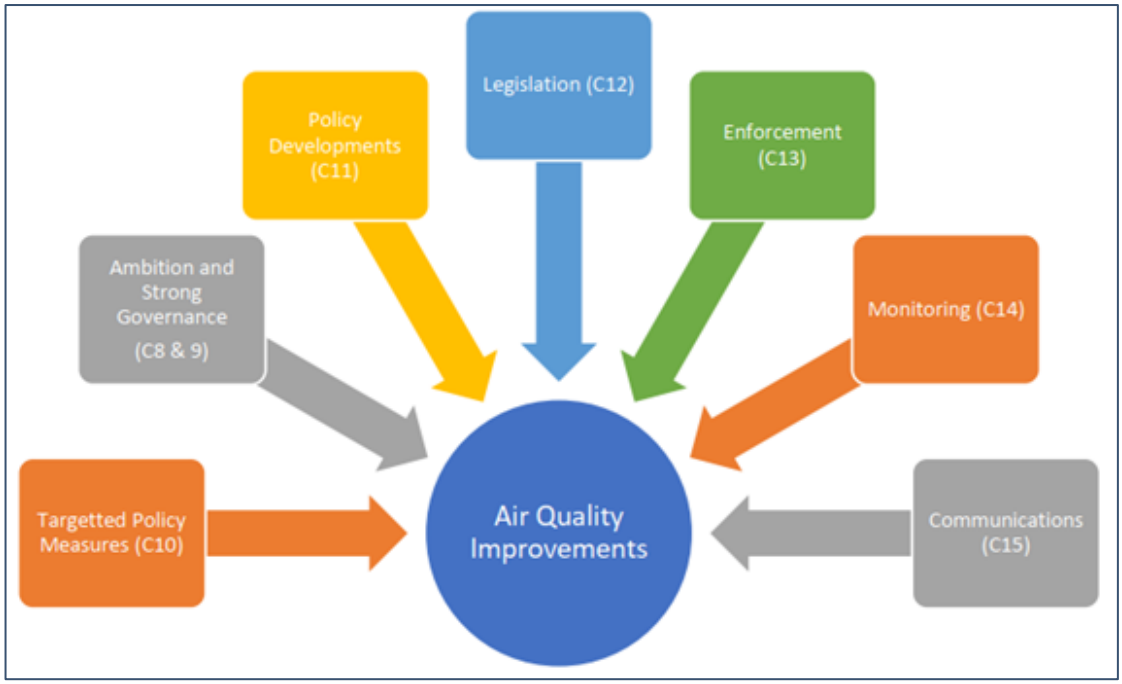

Figure 10-1 Seven Strategic Frameworks for Air Quality, with associated chapters in brackets. Reproduced as Figure 1 from Clean Air Strategy 2023

Chapter 11 of the Clean Air Strategy discusses Air Quality Policy Development. The chapter discusses energy policy and acknowledges how the State's accelerated transition to renewable electricity will be critical to successfully meeting the ambitious renewable energy and greenhouse gas emission reduction targets outlined in the European Green Deal and Ireland's Climate Action Plan 2025, as well as to protecting against security of supply risks and removal of fossil fuels from power generation. Wind (offshore and onshore) and solar energy will be the leading cost-effective technologies to achieve our energy and emissions targets, as well as displacing emissions in other sectors, including household heating and vehicle transport. In the Clean Air Strategy, Climate Action Plan 2023 is referenced, while Climate Action Plan 2025 is currently the latest revision. The targets of the Climate Action Plan 2025 and the European Green Deal are to deliver net-zero greenhouse gas emissions by 2050 and reduce greenhouse gas emissions to at least 55% by 2030, compared to 1990 levels.

In 2024[33] a progress report was released which detailed the progress made on the actions in the strategy since its publication in April 2023. In July 2025, a second progress report titled '*Clean Air Strategy for Ireland – Progress Report 2025*'[34] was released which states that Ireland has made further progress in reducing air pollution emissions and improving overall air quality, while recognising that additional measures will still be needed to meet future EU and WHO standards. The seven Strategic Frameworks introduced in the 2023 *Clean Air Strategy for Ireland* and illustrated above in Figure 10-1 remain the core structure underpinning the 2025 Progress Report.

Key points from the 2025 Progress Report include:

- Ireland remains compliant with current EU air quality standards for major pollutants.
- Emissions reductions have continued, supported by cleaner energy generation, reduced coal use, improved transport measures, and changes in home heating.
- Ireland achieved compliance with EU emissions reduction targets for all five major air pollutants in 2023, including ammonia.

[33] *Clean Air Strategy For Ireland First Progress Report 2024 . Available at: https://assets.gov.ie/static/documents/clean-air-strategy-for-ireland-first-progress-report.pdf*
[34] *Clean Air Strategy For Ireland Progress Report 2025. Available at: https://assets.gov.ie/static/documents/2025_06_17_CAS_Progress_Report.pdf*

- The Government approved the Air Pollution (Amendment) Bill 2025 to strengthen enforcement powers and regulation of solid fuels.

The report highlights ongoing challenges from:

- domestic solid fuel burning,
- transport emissions,
- agricultural emissions,
- meeting the stricter standards under Directive (EU) 2024/2881.

The EPA notes that, although Ireland currently complies with existing EU standards, it may struggle to achieve the tighter 2030 air quality limits without further action. Following the completion of the two progress reports the Department of Climate, Energy and the Environment sought feedback on the strategy in order to assess the potential for new actions to be included. This public consultation ended in November 2025.

10.1.8 Methodology

The assessment of the Prospective Development is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, the potential for significant effects will also be reduced.

10.1.8.1 Air Quality Zones

The air quality zone for the Site was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO_2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO) and Ozone (O_3) for the selected air quality zone to determine the representative levels of such emissions for the Prospective Development.

The EPA has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and Environs
- Zone B: Cork City and Environs
- Zone C: 16 urban areas within 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 as described in the CAFE Directive. The Site lies within Zone D, which represents rural areas located away from large population centres.

10.1.8.2 Air Quality Data Review

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in Ireland 2024' was published by the EPA in September 2025[35]. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D. These are detailed in the Baseline Air Quality section.

[35] *Environmental Protection Agency: Air Quality in Ireland 2024. Available at : https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2024.php*

10.1.8.3 Dust

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024)[36] (hereafter referred to as 'IAQM 2024 Guidance') was considered in the dust impact assessment. The guidance document outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. This methodology has been used to predict the likely risk of dust as a result of the construction phase works, operational phase activities and decommissioning phase. The use of UK guidance is considered best practice in the absence of applicable Irish guidance. The major dust generating activities are divided into four types within the IAQM Guidance (2024) to reflect their different potential impacts. These are:

- Demolition (There are no demolition works required for any phase of the Prospective Development);
- Earthworks;
- Construction;
- Trackout[37].

The magnitude of dust generating activities is divided into 'Large', 'Medium' or 'Small' scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. IAQM (2024) Guidance provides example definitions for the scale of the activities, and these are applied for this development as outlined in Table 10-6.

Table 10-6 Description of magnitude for nature of activities IAQM 2024 Guidance

	Large	Medium	Small
Demolition	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12m above ground level	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	Large: Total site area >110,000 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 >6m in height	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height	Total site area <18,000 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 m in height

[36] *Institute of Air Quality Management (IAQM). (2024). Guidance on the Assessment of Dust from Demolition and Construction. <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf >*

[37] *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 Goods Vehicles (HGVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HGVs transfer dust and dirt onto the road having travelled over muddy ground on site*

	Large	Medium	Small
Construction	Total building volume >75,000 m^3, on site concrete batching, sandblasting	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 Heavy Duty Vehicle (HDV) (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m
	Note: A vehicle movement is a one-way journey, i.e., from A to B and excludes the return journey. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average. * A HDV is a heavy-duty vehicle with a gross weight greater than 3.5 tonnes.		

The earthworks and construction activities for the Prospective Development is classified as 'Large'. The number of HDV movements per day, as outlined in Section 15.1 in Chapter 15: Material Assets of this EIAR (referred to as HGV/Heavy Goods Vehicles therein), results in the classification of the Prospective Development as 'Large' for trackout activities. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from onsite activities.

The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from onsite activities.

10.1.8.3.1 *Defining the Sensitivity of the Area*

When it comes to dust soiling, the IAQM 2024 defined a 'Receptor' *as a 'location that may be affected by dust emissions during demolition and construction. Human receptors include locations where people spend time and where property may be impacted by dust. Ecological receptors are habitats that might be sensitive to dust.'*

The IAQM provides include dwellings, museums and carparks as an example of a human 'Receptor Location' and categorises dwellings, where people would be reasonably expected to be present regularly or continuously, as high sensitivity Receptor Locations. Dust sensitive ecological habitats are further discussed below.

The IAQM (2024) Guidance has outlined three types of effects to be considered:

- Sensitivities of People to Dust Soiling Effects
- Sensitivities of People to the Health Effects of PM_{10}
- Sensitivities of Receptors to Ecological Effects.

Dust Soiling Study Area

IAQM (2024) guidance identifies a screening distance of up to 250m for potential dust soiling effects from construction activities, while also noting that dust deposition reduces quickly with increasing distance from the source. As such, for the purposes of this rEIAR, 250m is the dust soiling study area for the Existing Development.

Sensitivities of People to Dust Soiling Effects

Table 10-7 below identifies the sensitivity of an area to dust soiling effects on people and their properties, relative to different receptor sensitivities.

Table 10-7 Sensitivity of the Area to Dust Soiling Effects on People and Property. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Sensitivities of People to the Health Effects of PM_{10}

When assessing sensitivity of people to the health effects of PM_{10}, the IAQM (2024) guidance recommends the use of sensitivity bands based on whether or not the receptor is likely to be exposed to elevated concentrations of PM_{10} over a 24-hour period. Table 10-8 below identifies the sensitivity of an area to human health effects of PM_{10}, relative to different receptor sensitivities.

Table 10-8 Sensitivity of the Area to Human Health Impacts. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Sensitivities of Receptors to Ecological Effects

Dust deposition due to earthworks, construction and trackout had the potential to physically and chemically affect sensitive habitats and plant communities. The IAQM 2024 Guidance states that '*An 'ecological receptor' refers to any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation*

(SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particular site is sensitive to dust and this will depend on why it has been designated. ...The inclusion or exclusion of sites should be justified in the assessment.' The IAQM 2024 Guidance further states:

'Professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. Consequently, specialist ecological advice should also be sought to determine the sensitivity of the ecological receptors to dust impacts. In general most receptors will either be of high sensitivity or low sensitivity i.e. either sensitive or not to dust deposition'.

Examples of high sensitivity Receptors Locations given by IAQM 2024 include locations with an international or national designation and the designated features may be affected by dust soiling and dust bands of 20m and 50m from the dust source are recommended. Table 10-9 below identifies the sensitivity of an area to ecological impacts.

Table 10-9 Sensitivity of the Area to Ecological Impacts. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

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

10.1.8.3.2 Defining the Risk of Impacts

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts with no mitigation applied. The matrices in Table 10.10, Table 10.11, and Table 10.12 provide a method of assigning the level of risk for each activity.

Table 10-10 Risk of Dust Impacts for Earthworks, Construction, Trackout. (Source: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 24)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

The risk of dust impacts for the earthworks, construction and trackout activities from the Existing Development is summarised in Section 10.3.2.3 below.

EPA,2022 classification terminology as presented in Table 1-2 of Chapter 1 of this EIAR, have been correlated with the equivalent risk rating from Table 10-11 below.

Table 10-11 Correlation of Impact Classification Terminology (EPA, 2022) to Risk Rating

EPA, 2022 Term	EPA, 2022 Description	Risk Rating
Imperceptible	An effect capable of measurement but without significant consequences	Negligible
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities	Low
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends	Medium
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment	High

The risk of dust impacts for the Earthworks, Construction and Trackout activities from the Prospective Development is set out in Section 0 below.

10.2 Baseline Air Quality

The air quality in the vicinity of the Prospective Development is typical of that of rural areas of Ireland, i.e., Zone D. Prevailing south-westerly winds carry clean, unpolluted air from the Atlantic Ocean onto the Irish mainland. The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, '*Air Quality in Ireland 2024*' was published by the EPA in September 2025. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D. These are detailed in the following tables. Carbon Monoxide concentrations for areas in Zone D were obtained from the *'Air Quality in Ireland 2023'* due to operational issues resulting in monitoring disruptions in 2024.

10.2.1 Sulphur Dioxide(SO2)

The Sulphur dioxide data from Cork Harbour, Kilkitt, Askeaton and Edenderry in 2024 is presented in Table 10-12.

Table 10-12 Sulphur Dioxide Data for Zone D Sites in 2024

Parameter	Measurement
Annual Mean	2.8 µg/m^3
Hourly values > 350	0.0
Hourly max (Average)	36.2 µg/m^3
Daily values > 125	0
Daily max (Average)	14.7 µg/m^3

During the EPA monitoring period, there were no exceedances of the daily limit values for the protection of human health. As can be observed from Table 10-12 the average maximum hourly value recorded during the assessment period was 36.2 µg/m^3. In addition, there were no exceedances of the annual mean limit for the protection of ecosystems. It is expected, based on professional judgement and the rural setting within which the Site is located, that SO_2 values at the Site are similar or lower than those recorded for the Zone D sites above.

10.2.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, dust from soil and road surfaces, construction works and industrial emissions. The '*Air Quality in Ireland 2024'* report provides annual mean PM_{10} concentration for nineteen Zone D towns: Tipperary Town, Roscommon Town, Malin Head, Macroom, Longford, Kilkitt, Killarney, Ballinasloe, Enniscorthy, Edenderry, Cork Mallow, Cobh Carrignafoy, Claremorris, Cavan, Castlebar, Carrick-on-Shannon, Carnsore, Askeaton and Birr. Particulate matter (PM_{10}) data for 2024 is presented in Table 10-13.

Table 10-13 Average Particulate Matter (PM_{10}) Data for Zone D Sites in 2024

Parameter	Measurement
Annual Mean	11.5 µg/m^3
% Data Capture (Average)	94%
Values > 50 ug/m^3	Max 7 (Longford)
Daily Max (Average)	49.5 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was exceeded on 16 days, which is less than the PM_{10} daily limit for the protection of human health of a max 35 days >50 µg/m^3 applicable from 2005. The greatest number of exceedances occurred at Longford where the PM_{10} daily limit was exceeded on 7 no. occasions. In the EPA 2024 report, it notes that there were breaches in the levels of particulate matter (PM), which *"in Ireland, mainly comes from the burning of solid fuel, such as coal, peat, and wood to heat our homes".* It is expected, based on professional judgement and the rural setting within which the Site is located, that PM_{10} values at the Site are similar or lower than those recorded for the Zone D sites above.

10.2.3 Nitrogen Dioxide (NO_2)

Nitrogen dioxide data for Emo Court, Birr, Castlebar, Carrick-on-Shannon, Kilkitt, Cork Mallow and Edenderry in 2024 is presented in Table 10-14.

Table 10-14 Average Nitrogen Dioxide Data for Zone D Sites in 2024

Parameter	Measurement
Annual Mean (Average)	8.3 µg/m^3
NO_2 Values >200	0
Values > 140 (UAT)	0
Values >100 (LAT)	1
Hourly Max. (Average)	68.6µg/m^3

The annual NO_2 value was below the annual mean limit value for the protection of human health of 40 µg/m^3. The lower assessment threshold of 100 µg/m3 was exceeded once during the monitoring period in Edenderry, Co. Offaly while the upper assessment threshold of 140 µg/m3 was not exceeded during the monitoring period. The 18 day limit was not exceeded during the monitoring period. In 2024, no other monitoring locations in Zone D had exceedances in the lower and upper assessment thresholds of 100 and 140 µg/m3. The average hourly max. NO_2 value of 68.6 µg/m^3 measured during the monitoring

period was below the hourly max threshold of 200 µg/m^3. It is expected, based on professional judgement, that NO_2 values at the Wind Farm Site are similar or lower than those recorded for the Zone D sites above.

10.2.4 Carbon Monoxide (CO)

The 2024 EPA Report did not include CO figures for Zone D due to operational issues at Birr. Due to this the data provided in Table 10-16 below is taken from 'Air Quality in Ireland, 2023'[38]. The 2023 EPA report provided a rolling 8-hour carbon monoxide concentrations for Birr, a Zone D site. Carbon Monoxide data for 2023 is presented in Table 10-15.

Table 10-15 Carbon Monoxide Data for Birr – Zone D Site in 2023.

Parameter	Measurement
Annual Mean	0.6 mg/m^3
Median	0.6 mg/m^3
% Data Capture	99.8%
Values > 10	0
Max	2.2 mg/m^3

The average concentration of carbon monoxide was 0.6 mg/m^3. The carbon monoxide limit value for the protection of human health is 10,000 µg/m^3 (or 10 mg/m^3). On no occasions were values in excess of the 10 mg limit value set out in Directive 2008/50/EC. It is expected, based on professional judgement and the rural setting within which the Site is located, that the CO value at the Site are similar or lower than those recorded for the Zone D site above.

10.2.5 Ozone (O_3)

The '*Air Quality in Ireland 2024'* report provides rolling 8-hour ozone concentrations for eight Zone D sites: Emo Court, Kilkitt, Carnsore Point, Mace Head, Castlebar, Cork Mallow, Valentia and Malin Head. Ozone (O_3) data for 2024 is presented in Table 10-16.

Table 10-16 Average Ozone Data for Zone D Sites in 2023.

Parameter	Measurement
Annual Mean	58.9µg/m^3
Median	59.9 µg/m3
% Data Capture	84.1%
No. of days > 120 µg/m^3	0 days

As can be observed from Table 10-16 there were no exceedances of the maximum daily eight-hour mean limit of 120 µg/m3. The CAFE Directive stipulates that this limit should not be exceeded on more than 25 days per calendar year averaged over 3 years. It would be expected, based on professional

[38] *Air Quality in Ireland 2023,* https://www.epa.ie/publications/monitoring–assessment/air/air-quality-in-ireland-2023.php

judgement and the rural setting within which the Site is located, that O3 values at the Wind Farm Site would be similar or lower than those recorded for the Zone D sites below.

10.2.6 Dust

There are no statutory limits for dust deposition in Ireland. However, the EPA recommends a maximum daily dust deposition level of 350 mg/m^2/day for the extractive industry[39] when measured according to the German TA Luft Standard 2002. A conservative limit of 10 mg/m^2/hour which equates to 240 mg/m^2/day, is typically applied in EPA waste and quarrying licences, and is used to assess potential for short-term soiling impacts. This limit value can also be implemented with regard to dust impacts from construction activities associated with the Prospective Development.

The extent of dust generation at any site depends on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, etc., and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or periods of dry weather. Construction dust has the potential to be generated from onsite activities such as earthmoving/earthworks and construction. Construction traffic movements (i.e. track-outs) also have the potential to generate dust as they travel along the haul route.

The potential dust-related effects on local air quality and the relevant associated mitigation measures are presented in Sections 0 below.

10.2.6.1 Existing High Sensitivity Receptor Locations

10.2.6.1.1 *Human*

As discussed in Section 10.1.8.3.1, dwellings, where people would be reasonably expected to be present regularly or continuously, are categorised as high sensitivity Receptor Locations.

The closest distance between a proposed works area within the Wind Farm Site and a residential Receptor Location is approximately 70m. This residential receptor is located adjacent to the northern boundary of the Wind Farm Site. This is the only residential receptor within 250m of the Wind Farm Site. There are 2 no. residential Receptor Location located within 250 m of the of the Biodiversity Enhancement Site proposed works area. When considering the IAQM 2024 Guidance for dust soiling, within the 250m study area,

- There are no residential Receptor Locations located within 20 m of the Prospective Development works area;
- There is 1 no. residential Receptor Location within 50 m of the of the Prospective Development works area;
- There are no residential Receptor Locations within 100 m of the Prospective Development works area
- There are 2 no. residential Receptor Locations within 250 m of the Prospective Development works area (i.e. the Biodiversity Enhancement Site).

As such, there is a total of 3 no. residential Receptor Locations within 250m of the Prospective Development works areas.

10.2.6.1.2 *Ecological*

[39] *EPA Guidance Note on Environmental Management in the Extractive Industries (2006). Available at:* https://www.epa.ie/publications/licensing--permitting/industrial/ied/environmental-management-in-the-extractive-industry.php

Ecological Receptors Locations within the Wind Farm Site that may be sensitive to dust are listed below:

- Wet Heath (HH3) – Medium Sensitivity (county importance), >50m from the Prospective Development Upland Blanket Bog (PB2) - Medium Sensitivity (county importance), <20m from the Prospective Development
- Eroding Upland River (FL1) and associated aquatic species – Low to Medium (Local Importance (Higher Value)), <20m from the Prospective Development
- Dystrophic Lake (FL1) – Medium Sensitivity (county importance), >150m from the Prospective Development
- Croaghonagh Bog Special Area of Conservation (SAC)- High Sensitivity (International Importance), <20m from the Prospective Development.
- River Finn SAC- High Sensitivity -<20m from the Prospective Development (BMEP Site)

As the IAQM 2024 guidance considers dust soiling on ecological receptors of a high sensitivity value within 50m of a construction area, Wet Heath, Upland Blanket Bog, Eroding Upland Rivers and Dystrophic lakes are not considered further in this assessment.

From the above list, there are 2 no. ecological receptors categorised as a high sensitive Receptor Locations within 20m of the Prospective Development; the Croaghonagh Bog SAC and the River Finn SAC. The qualifying interests (QIs) of these SACs are:

Croaghonagh Bog SAC:

- Blanket bogs (* if active bog) [7130].

River Finn SAC:

Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]

- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- Blanket bogs (* if active bog) [7130]
- Transition mires and quaking bogs [7140]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

These high sensitive ecological Receptor Locations are assessed below in Sections 10.3.2.3 and 10.3.2.4.

The above identified ecological receptors have been assessed within Chapter 6 Biodiversity, Chapter 9 Hydrology and Hydrogeology, and the Natura Impact Statement (NIS).

Refer to Figure 10-2 for the location of the residential and ecological Receptor Locations discussed above.

606000
609000
612000
888000
885000
882000

Croaghonagh Bog SAC

20m
50m
100m
250m

River Finn SAC

0 0.5 1 1.5 km

Map Legend

- Wind Farm Site and BMEP Site Boundary
- Prospective Development Works Area Footprint
- Receptor Locations - Residential
- Receptor Locations - Ecological

IAQM Dust Deposition Bands

- 20m
- 50m
- 100m
- 250m

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
IAQM Dust Deposition Bands for the Prospective Development Works Area

Project Title
Meenbog Wind Farm, Co. Donegal

Project No.	Drawing No.	Scale
240505	Figure 10-2	1:30,000
Drawn by	Checked by	Date
EON	KM	30/06/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

10.3 Likely and Significant Impacts and Associated Mitigation Measures

10.3.1 'Do-Nothing' Scenario

If the Prospective Development was not to proceed, the Site will continue to function as it does at present, with no changes to the current land-use and air quality.

In this scenario, the Existing Development will remain in-situ as an unauthorised and partially completed wind farm, which is, in effect, the "do nothing" option insofar as it represents the current situation as at the date of the application for Substitute Consent. The impact of this is considered neutral in the context of this EIAR. However, by implementing this 'Do-Nothing' alternative, the opportunity to capture a significant part of the country's renewable energy resource by completing the Meenbog Wind Farm (subject to the appropriate planning consent) would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment, local authority development contributions, rates and investment in the local area would also be lost.

Furthermore, the opportunity to capture an even greater part of County Donegal's valuable renewable energy resource would be lost, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

In addition, the opportunity to implement the proposed biodiversity enhancement measures would be lost. Please see Prospective Development EIAR, Appendix 6-4 Biodiversity Enhancement and Management Plan for details.

10.3.2 Construction Phase

10.3.2.1 Exhaust Emissions

Pre-Mitigation Impact

Exhaust emissions associated with vehicles and plant such as NO_2, Benzene and PM_{10} will arise as a result of construction activities as described in Chapter 4 of this EIAR. This activity will be restricted to the duration of the construction phase, which will take approximately 12 months to complete, and will be localised to construction works areas within the Site. This constitutes a short-term, slight, negative effect in terms of air quality and is not significant. Mitigation measures in relation to exhaust emissions are presented below.

Mitigation & Monitoring Measures for the Prospective Development

- Prospective Development construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager will produce a site inspection and machinery checklist which will be followed and updated if/when required.
- All plant and materials vehicles shall be stored in dedicated areas (onsite).
- Machinery will be switched off when not in use to limit exhaust emissions from idling.

- Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.
- The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.
- Aggregate materials for the construction of the wind farm infrastructure will be predominantly sourced onsite, and locally sourced if required, which will further reduce potential emissions.
- A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3).

Residual Effect

The residual effects on air quality from the construction phase, following the implementation of the above mitigation measures, are considered to be temporary-to-short-term, slight, negative effect that is not significant.

Significance of Effects

Based on the evaluation above, there will be no significant direct or indirect effects on air quality from exhaust emissions arising from the construction activities associated with the Prospective Development.

10.3.2.2 Exhaust Emissions: Transport to and from the Site

Pre-Mitigation Impact

The transport of turbine components, supporting infrastructure materials, construction and staff vehicles, and waste removal vehicles to/from the Site, (see accompanying CEMP Appendix 4-3) will give rise to exhaust emissions associated with the transport vehicles. This constitutes a short-term, slight, negative effect in terms of air quality, which is not significant. Mitigation measures in relation to exhaust emissions are presented below.

Mitigation and Monitoring Measures

- Measures listed in Section 10.3.2.1 above pertaining to exhaust emissions will be implemented for the transportation of vehicles to and from the Site.
- Aggregate materials for the construction of the wind farm infrastructure will be predominantly sourced onsite, and locally sourced if required, which will further reduce potential emissions.
- Turbines and construction materials will be transported to the Site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15: Material Assets for details.
- Waste material will be transferred from the Site to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.
- A CEMP will be in place throughout the construction phase (see Appendix 4-3).

Residual Effect

Following implementation of the above mitigation measures, residual effects from exhaust emissions arising from transportation activities will have a short-term, imperceptible, negative effect on air quality that is not significant.

Significance of Effects

Based on the evaluation above, there will be no significant direct or indirect effects on air quality from exhaust emissions arising from transportation activities during the construction phase of the Prospective Development.

10.3.2.3 Dust Emissions

Pre-Mitigation Impact

The IAQM 2024 Guidance, as discussed in Section 10.1.8.3 above, is used to assess the potential risk to Receptor Locations from dust deposition. High sensitivity residential Receptor Locations in the vicinity of the Wind Farm Site and BMEP Site were identified using a constraints mapping process, and detailed and updated planning searches which informed the project sensitive receptor dataset.

The construction works associated with the Prospective Development, as described in Chapter 4 of this EIAR, will give rise to localised dust emissions. It is intended to obtain the majority of materials for the construction of the Prospective Development from the onsite borrow pits. It is estimated that approx. 74,180m^3 of stone material will be required to complete construction of the Prospective Development. Engineer's specified material may be imported onto the Wind Farm Site for capping should suitable quality material not be encountered during excavation for the Prospective Development. It is estimated that 8,000m^3 of capping grade stone material (C1804) is required to complete the Prospective Development. The removal of peat followed by its transportation and management at the peat management areas during the construction phase will also give rise to dust emissions.

The high sensitivity residential Receptor Locations located within the appropriate distance from potential dust emission sources, provided by the IAQM 2024 Guidance, are detailed below and presented in Table 10-17 below for the Site. As discussed in Section 10.2.1.6.1, there is a total of 3 no. residential Receptor Locations within 250m of the Prospective Development works areas. Taking the number of residential Receptor Locations and their proximity to the Prospective Development construction works areas, Table 10-17 below identifies the sensitivity of the area surrounding these construction works areas to dust soiling effects. The overall sensitivity of the area to dust soiling effects is **Low.**

Table 10-17 Sensitivity of the Area to Dust Soiling Effects on People and Property. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 10-18 below identifies the high sensitivity residential Receptor Locations in the area surrounding the Wind Farm Site and BMEP Site to the health effects of PM_{10}, as described in Section 10.1.8.3.1 above. The overall sensitivity of the area to human health effects of PM_{10} is considered to be **Low**. As indicated in Section 10.1.8.1 above, the Prospective Development is situated in Zone D. According to the 2021 EPA baseline air quality data[40]; the average PM_{10} for Zone D is 14µg/m^3. Therefore, the only annual PM_{10} concentration categorised in the IAQM 2024 Guidance relevant to the Prospective Development is the minimum concentration of <24µg/m3 (<14 µg/m3 in Scotland).

Table 10-18 Sensitivity of the Area to Human Health Impacts from the Prospective Development construction works. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>10	Low	Low	Low	Low
		1-10				
Low	-	≥1	Low	Low	Low	Low

Table 10-19 below identifies the high sensitivity ecological Receptor Locations within 50m of the Existing Development. As noted above in Section 10.2.1.6.1, there are 2 no. high sensitivity ecological Receptor Locations (Croaghonagh Bog SAC and River Finn SAC) within 20m distance from the Prospective Development. These ecological receptors are categorised as of a 'High' importance due to its international status as a European Designated Site.

However, as the QIs of these Designated Sites are not considered sensitive to dust soiling, and as discussed in Section 10.1.8.3.1, using professional judgement and a detailed ecological assessment of

[40] https://www.epa.ie/resources/charts–data/air/air-quality–pm10.php

this SAC in Chapter 6 of this rEIAR and the rNIS, the sensitivity of these ecological Receptor Locations is considered **Low**.

Refer to Chapter 6 of this rEIAR and the rNIS for a detailed ecological impact assessment assessing impacts on these ecological receptors during the construction of the Existing Development.

Table 10-19 Sensitivity of the Wind Farm Site to Ecological Impacts. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

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

As identified in Section 10.1.8.3 above, the Prospective Development is classified as 'Large' for Earthworks, Construction and Trackout activities. Therefore, when combined with the sensitivity of the area, using Table 10-7 to Table 10-9 above as guidance, the pre-mitigation risk of impacts from the Prospective Development is summarised in Table 10-20 below.

Table 10-20 Summary Dust Risk Table for Prospective Development Activities

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Low Risk	Low Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk
Ecological	N/A	Low Risk	Low Risk	Low Risk

The overall risk of dust emissions impacts with no mitigation applied for the major dust generating activities during the construction of the Prospective Development is **Low** for both residential and ecological Receptor Locations. Therefore, the potential effects of dust from the construction of the Prospective Development is considered to be an intermittent, slight negative and local effect which is not significant within the short-term construction phase for humans and ecology. Mitigation measures that will be implemented onsite to reduce these effects on sensitive Receptor Locations are presented below.

Mitigation & Monitoring Measures for the Prospective Development

- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff.
- The transportation of materials from the borrow pit around the Wind Farm Site will be covered by tarpaulin or similar covered vehicles where necessary.

- If necessary, excavated material will be dampened prior to transport to the spoil management areas.
- A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3). The CEMP includes dust suppression measures.
- The ECoW will undertake inspections of construction works areas to examine dust measures and their effectiveness. Should the existing measures not prove effect on occasion, measures to enhance dust suppression include including increased water suppression, reduced vehicle speeds, and temporary cessation of dust-generating activities under adverse weather conditions.

Residual Effect

With the implementation of the above, the Prospective Development is considered to have a short-term, slight, negative effect on air quality brought about by dust emissions generated during the construction activities, that is not significant.

Significance of Effects

Based on the evaluation above, there will be no significant direct or indirect effects on air quality from dust emissions arising from construction activities during the construction phase of the Prospective Development.

10.3.2.4 Dust Emissions: Transport to and from the Site

Pre-Mitigation Impact

The transport of turbine components, supporting infrastructure materials, construction and staff vehicles, small volume of aggregate material and waste removal vehicles to and from the Site, the departure of empty vehicles and/or minor waste volumes (please see accompanying CEMP Appendix 4-3) from the Site, and daily staff movements will also give rise to some localised dust emissions during periods of dry weather.

The IAQM 2024 Guidance states that the routes of construction traffic should also be included in an assessment of dust arising from trackout, and that related construction dust impact increases with respect to the number of movements of HGVs per day, length of unpaved road, distance to receptors and the sensitivity of local receptors. The IAQM 2024 Guidance considers that 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

For the purposes of this assessment of the dust emissions along 250m either side of the Wind Farm Site entrance arising from construction traffic entering and exiting the Wind Farm Site during the construction of the Prospective Development, including the entrances into the BEMP Site, have been considered for assessment.

There are no sensitive residential Receptor Locations within 250m either side of the Wind Farm Site entrance or the BEMP Site entrance; however, mitigation measures as detailed below will be implemented throughout the construction phase to minimise the potential for impacts on air quality due to dust emissions generated by construction phase of the Prospective Development.

Mitigation and Monitoring Measures

- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not

cause a nuisance. Water bowser movements will be monitored by the ECoW to avoid increased runoff.

- Turbine components, construction material and construction traffic will be transported to the Site on specified haul routes only, as agreed with the local authority.
- The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.
- The roads adjacent to the Wind Farm Site entrance will be checked weekly for damage/potholes and repaired as necessary.
- The transport of construction materials around the Site from the nearby quarry facilities will be covered by tarpaulin where necessary.
- A CEMP will be in place throughout the construction phase (see Appendix 4-3).
- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be monitored by the ECoW to avoid increased runoff.

Residual Effect

Following implementation of mitigation measures as outlined above, residual effects on air quality from dust emissions from traffic movements to and from the Site during the construction phase will have a short-term, imperceptible, negative effect on air quality that is not significant.

Significance of Effects

Based on the evaluation above, there will be no significant direct or indirect effects on air quality from dust emissions arising from transportation activities during the construction phase of the Prospective Development.

10.3.3 Operational Phase

10.3.3.1 Exhaust Emissions: Prospective Development Infrastructure

Pre-Mitigation Impact

The operational phase of the Prospective Development will generate additional traffic to the area in the form of light goods vehicles (LGVs) visiting the Site 1-2 times per day for inspections but on occasion, daily visits by LGVs and HGVs may be required over short periods during maintenance/component replacement activities. The addition of a LGV to the area 1-2 times per day during the operational phase will give rise to a long-term, imperceptible, negative effect on air quality due to exhaust emissions, which is not significant.

The addition of several HGVs on occasion over the 35-year lifetime of the Prospective Development will give rise to a long-term, imperceptible, negative effect that is not significant, due to the localised and intermittent nature of the maintenance.

In addition to the above, the existing agricultural and commercial forestry activities within the Wind Farm Site will continue during the operational phase, and associated machinery will continue to utilise the Site as required.

The permanent onsite 110kV substation will be operated and maintained by the Electricity Supply Board (ESB) and EirGrid throughout the lifetime of the wind farm. It is anticipated that substation operators will visit the Site 1-2 times per day in LGVs but on occasion, HGVs may be required to visit

the Site for maintenance/substation component replacement. On occasion, the removal of hydrocarbons (transformer oil) and waste from substation welfare facilities will be removed from the Site by a licenced waste disposal company. The addition of a LGV to the area 1-2 times per day during the operational phase will give rise to a long-term, imperceptible, negative effect on air quality due to exhaust emissions, which is not significant. The addition of several HGVs on occasion over the 35-year lifetime of the Prospective Development will give rise to a long-term, imperceptible, negative effect on air quality that is not significant.

Mitigation and Monitoring Measures

- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- When stationary, delivery and onsite vehicles will be required to turn off engines.
- Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
- The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.

Residual Effect

Based on the above, the residual effect on air quality from exhaust emissions during the operational phase is a long-term, imperceptible, negative effect that is not significant.

Significance of Effects

Based on the assessment above there will be no significant effects on air quality from exhaust emissions arising during the operational phase of the Prospective Development.

10.3.3.2 Dust Emissions: Prospective Development Infrastructure

Pre-Mitigation Impact

As discussed above in Section 10.3.3.1, the operational phase of the Prospective Development will generate additional traffic to the area in the form of LGVs 1-2 visits per day and on occasion, daily LGVs and HGVs for short periods if maintenance or component replacement is required. This additional traffic may give rise to dust emissions. This will be a long-term imperceptible negative impact on air quality, which is not significant, due to dust emissions.

As outlined above in Section 10.3.3.1, the permanent onsite 110kV substation will be operated and maintained by the Electricity Supply Board (ESB) and EirGrid. It is anticipated that substation operators will visit the Site 1-2 times per day in LGVs but on occasion, HGVs may be required to visit the Site for maintenance/substation component replacement. On occasion, the removal of hydrocarbons (transformer oil) and waste from substation welfare facilities will be removed from the Site by a licenced waste disposal company. This additional traffic may give rise to dust emissions. This will be a long-term imperceptible negative impact on air quality due to dust emissions.

Mitigation and Monitoring Measures

- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any dust emissions that arise.

- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
- The MRF facility will be local to the site to reduce the emissions associated with vehicle movements.

Residual Effect

Based on the above, the residual effect on air quality from dust emissions during the operational phase is a long-term, imperceptible, negative effect that is not significant.

Significance of Effects

Based on the assessment above there will be no significant effects on air quality from dust arising during the operational phase of the Prospective Development.

10.3.3.3 Overall Effects on Air Quality

10.3.3.3.1 *Operational Phase: Air Quality*

Although a long-term imperceptible negative effect on air quality is expected during the operational phase due to exhaust and dust emissions from maintenance vehicles, there will be no net carbon dioxide (CO_2) emissions from the operation of the Prospective Development. By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Prospective Development 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 Prospective Development will have a long-term moderate positive effect on air quality due to the offsetting of approximately 53,097 tonnes of Carbon Dioxide (CO_2) per annum. Please see Section 11.4.3.2 of Chapter 11 Climate for further details on carbon displacement calculations.

Mitigation and Monitoring Measures

No mitigation required.

Residual Effect

The overall effect will be a long-term moderate positive effect on air quality due to the offsetting of approximately 53,097 tCO_2eq per annum (see Chapter 11 for details), due to the provision of renewable energy in the range of approximately 62,000 Irish households with electricity per year.

Significance of Effects

Based on the assessment above there will be a significant positive effect on air quality due to the operation of the Prospective Development.

10.3.3.3.2 *Operational Phase: Human Health*

Whilst the operational phases of the Prospective Development will give rise to minor increases in dust and vehicle emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent or minimise potential effects off-site. Good management practice consists of good site design and layout, adopting appropriate working methods, choosing the right equipment and ensuring that the workforce understands the company's responsibilities and is familiar with good working practice and dust suppression techniques. The potential for health effects is

considered negligible as the potential for both exhaust and dust emissions will be limited and controlled through site layout design and mitigation measures outlined in Sections 10.3.2.1 to 10.3.2.4.

Exposure to chemicals such as SO_2 and NO_x, Pb, benzene and O_3 are thought to be harmful to human health. The production of clean renewable energy from the Subject Development will offset the emission of these harmful chemicals by fossil fuel powered sources of electricity and, therefore, will have a long term, slight, positive impact on human health. Further information on the impact of the Prospective Development on human health is contained in Chapter 5: Population and Human Health.

Mitigation and Monitoring Measures

No mitigation required.

Residual Effect

Long-term, imperceptible, negative and not significant effect on human health.

Significance of Effects

Based on the assessment above there will be no significant effects.

10.3.4 Decommissioning Phase

The Prospective Development is seeking permission for an operational life of 25 years. Wind turbines are expected to have a lifespan of greater than 25 years. Following the end of their life, the wind turbines may be upgraded or replaced with a new set of turbines, subject to planning permission being obtained, or the Subject Development may be decommissioned fully. The onsite 110kV substation and underground electrical cabling will remain in place as it will be under the ownership and control of the ESBN/ EirGrid.

A Decommissioning Plan is included as Appendix 4-6 of this EIAR for the decommissioning of the Subject Development, the detail of which will be agreed with the local authority prior to any decommissioning. Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less effect. The mitigation measures prescribed for the construction phase of the Prospective Development will be implemented during the decommissioning phase thereby minimising any potential effects. The potential for effects during the decommissioning phase of the Prospective Development has been fully assessed within this EIAR. The principles that will inform the final decommissioning plan are contained in the CEMP in Appendix 4-3.

10.4 Cumulative Effects – Prospective Development

For the assessment of cumulative effects, other existing, permitted or proposed projects (wind energy or otherwise) must be considered. A review of all existing, proposed projects and/or plans within the air quality study area of 250m has been undertaken with the purpose of identifying what influence the Prospective Development will have on the surrounding environment when considered cumulatively with other developments. Further information on projects considered as part of the cumulative assessment and cumulative assessment methodology are in Section 2.9 of Chapter 2: Background and Policy of the rEIAR and Section 2.10 of Chapter 2: Background and Policy EIAR. The only developments/activities as highlighted in Appendix 2-1 that fall within the cumulative study area of 250m for air quality are forestry and agriculture.

10.4.1 Construction Phase

With the implementation of the mitigation measures detailed in Section 10.3.2.1 to 10.3.2.4, cumulative effects on high sensitivity residential and ecological Receptor Locations from the intermittent dust and exhaust emissions generated during the short-term construction phase the Prospective Development with forest and agricultural activities within the 250m study area are considered to be Low and Not Significant.

10.4.2 Operational Phase

Exhaust emissions of carbon dioxide (CO_2), oxides of nitrogen (NO_x), sulphur dioxide (SO_2) or dust emissions during the operational phase of the Subject Development will be minimal, relating to the use of operation and maintenance vehicles onsite (1-2 daily visits from LGVs), and therefore there will be no measurable negative cumulative effect with other developments on air quality. Refer to Section 10.3.3 for details.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Subject Development 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 Prospective Development will have a Long-Term Moderate Positive effect on air quality due to the offsetting of approximately 53,100 tonnes of Carbon Dioxide (CO_2) per annum, or 1,327,000 tonnes of carbon dioxide over the proposed 25-year lifecycle of the Subject Development. As such, once the Prospective Development is operational, it will provide a long-term, significant, positive impact on the air quality.

It is therefore considered there will be no measurable negative cumulative effects on air quality from the Prospective Development with other proposed projects and/or plans within the air quality study area (forestry and agriculture activities), should they be ongoing in parallel with the Prospective Development.

10.4.3 Decommissioning Phase

The works required during the decommissioning phase are described in Section 4.12 in Chapter 4: Description of the Prospective Development and the Decommissioning Plan (Appendix 4-6). Any cumulative impact and consequential effect that occurs during the decommissioning phase will be similar to that which are predicted to occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Prospective Development will be implemented during the decommissioning phase thereby minimising any potential cumulative effects.

10.4.4 Conclusion

The nature of the Prospective Development and other projects and/or plans, including but not limited to wind energy developments within the air quality study area and beyond, are such that, once operational, the Prospective Development in combination with other proposed and operational wind energy developments will have a cumulative long-term, moderate, positive effect on the air quality and climate.

10.5 In-Cumulation Effects

Table 10-21 considers the residual in-cumulation impact of the combination of the Existing Development and Prospective Development (the Subject Development).

Table 10-21 Assessment of potential In-Cumulation Effects of the Subject Development

Topic		Existing Development	Prospective Development	Subject Development
Air Quality	Exhaust Emissions	The Existing Development has had no significant direct or indirect effects on air quality as a result of exhaust emissions associated with its construction. The effects are assessed as having had an imperceptible, negative, local effect on air quality. These effects would have been brief and intermittent across the short-term construction phase.	The Prospective Development will have no significant direct or indirect effects on air quality as a result of exhaust emissions associated with the construction, operation and decommissioning of the Prospective Development. The effects on air quality arising from exhaust emissions related to the Prospective Development are Not Significant. Overall, considering offsetting of greenhouse gas emissions from fossil fuels as a result of the operational phase of the Prospective Development, there will be a long-term overall moderate positive effect on air quality, resulting in a significant positive effect on air quality, overall	The effects on air quality relating to exhaust emissions for the Existing Development are Not Significant. The operational phase of the Prospective Development will result in the net displacement of approximately 53,000 tonnes of carbon dioxide equivalent (CO2e) from fossil fuel sources per annum. As such, this results in an overall significant positive effect on air quality arising from the Subject Development. Notwithstanding, there is no temporal overlap between the Prospective Development and the Existing Development and therefore no potential for an in cumulation effect. The potential for In-Cumulation effects from the Subject Development is Not Significant.

Topic		Existing Development	Prospective Development	Subject Development
	Dust Emissions	The dust soiling impact during the construction of the Existing Development is considered to have been an imperceptible to slight, negative and local effect. These effects would have been brief and intermittent across the short-term construction phase. Overall, the effects on air quality arising from dust emissions associated with the construction of the Existing Development were Not Significant.	With the implementation of the mitigation measures listed in Chapter 18 of this EIAR, residual effects on air quality arising from dust associated with construction activities and movement of machinery to and from Wind Farm Site are considered to have a short-term slight negative effect on air quality. Effects related to the operational stage are considered long-term, imperceptible, negative, but not deemed significant. Overall, effects on air quality arising from dust emissions associated with the Prospective Development are Not Significant.	The effects on Air Quality related to dust emissions from both the Prospective Development and the Existing Development will be Not Significant. The potential for In-Cumulation effects on Air Quality from the Subject Development is Not Significant.

10.6 Cumulative Effects- Subject Development

For the assessment of cumulative effects, other existing, permitted or proposed projects (wind energy or otherwise) must be considered. A review of all existing, proposed projects and/or plans within the air quality study area of 250m has been undertaken with the purpose of identifying what influence the Subject Development will have on the surrounding environment when considered cumulatively with other developments. Further information on projects considered as part of the cumulative assessment and cumulative assessment methodology are in Section 2.9 of Chapter 2: Background and Policy of the rEIAR and Section 2.10 of Chapter 2: Background and Policy EIAR. The only developments/activities as highlighted in Appendix 2-1of this EIAR and Appendix 2-1 of the rEIAR that fall within the cumulative study area of 250m for air quality are forestry and agriculture.

10.6.1 Construction Phase

With the implementation of the mitigation measures detailed in Section 10.3.2.1 to 10.3.2.4 of Chapter 10 of this EIAR for the Prospective Development, cumulative effects on high sensitivity residential and ecological Receptor Locations from construction dust and exhaust emissions of the Prospective Development with forest and agricultural activities are considered to be Low and Not Significant. Refer to Chapter 10 Air Quality of the rEIAR for the Existing Development for details on the historical effects.

10.6.2 Operational Phase

Exhaust emissions of carbon dioxide (CO_2), oxides of nitrogen (NO_x), sulphur dioxide (SO_2) or dust emissions during the operational phase of the Subject Development will be minimal, relating to the use of operation and maintenance vehicles onsite, and therefore there will be no measurable negative cumulative effect with other developments on air quality. Operational phase impacts will arise from the Prospective Development only.

By providing an alternative to electricity derived from coal, oil or gas-fired power stations, the Subject Development 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 Subject Development will have a Long-Term Moderate Positive effect on air quality due to the offsetting of approximately 53,000 tonnes of Carbon Dioxide (CO_2) per annum, or 1,327,425 tonnes of carbon dioxide over the proposed 25-year lifecycle of the Subject Development. As such, once the Subject Development is operational, it will provide a long-term, significant, positive impact on the air quality.

It is therefore considered there will be no measurable negative cumulative effects on air quality from the Subject Development with other proposed projects and/or plans in the surrounding landscape, including and forestry and agriculture activities, should they be operational in parallel with the Subject Development.

10.6.3 Decommissioning Phase

The works required during the decommissioning phase of the Subject Development are described in Section 4.12 in Chapter 4: Description of the accompanying EIAR for the Prospective Development. Any cumulative impact and consequential effect that occurs during the decommissioning phase is similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Prospective Development (refer to Chapter 18 Schedule of Mitigation and Monitoring Measures of the accompanying EIAR for the Prospective) will be

implemented during the decommissioning phase thereby minimising any potential cumulative effects arising from the Subject Development.

10.1 Transboundary Effects

This section considers the potential for transboundary effects as a result of the Subject Development. Table 10-22 below details the residual effects of the Subject Development, and the potential for which the Subject Development could affect a different jurisdiction.

Table 10-22 Assessment of potential Transboundary Effects of the Subject Development

Topic		Existing Development	Prospective Development	Subject Development
Air Quality	Exhaust Emissions	There was No Significant Effect on air quality arising from exhaust emissions within the Existing Development Study Area, thus there was no potential for Significant Transboundary Effects.	No Significant Effect on air quality arising from exhaust emissions within the Study Area, thus there is no potential for Significant Transboundary Effects from the Prospective Development.	No potential for Significant Transboundary Effects from the Subject Development.
	Dust Emissions	There was No Significant Effect on air quality arising from dust emissions within the Existing Development Study Area, thus there was no potential for Significant Transboundary Effects.	No Significant Effect on air quality arising from dust emissions within the Study Area, thus there is no potential for Significant Transboundary Effects from the Prospective Development.	No potential for Significant Transboundary Effects from the Subject Development.