10. AIR QUALITY

10.1 Introduction

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 Proposed Development.

The site of the Wind Farm is located in east Co. Clare, approximately 3 km south of Broadford, 3.5 km southeast from Kilkishen, and 4 km northeast from Sixmilebridge, Co. Clare. The townlands within which the Wind Farm Site and Grid Connection is located can be found in Chapter 1 Table 1-1 of this EIAR.

Current land-use on the Wind Farm Site comprises coniferous forestry, biodiversity areas under Coillte management and third-party lands currently being used for agricultural and forestry. Current land-use along the Grid Connection comprises of public road corridor and coniferous forestry. Land-use in the wider landscape comprises a mix of agriculture, low density residential and commercial forestry. Due to the nature of the Proposed Development and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR. Based on professional judgement it is considered that that air quality in the existing environment is reflective of the Environmental Protection Agency's (EPA) Air Quality Zone D, as described in Section 10.2.2.2 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 of the Proposed Development include vehicular and dust emissions.

10.1.1 Relevant Guidance

The air quality section of this Environmental Impact Assessment Report (EIAR) has been completed 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.

- Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107' (Transport Infrastructure Ireland, December 2022).
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports – June 2022 (EPA, 2022).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017).
- Air Quality in Ireland Report 2022 (EPA 2023).
- Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (EPA 2021).
- Guidance of the Assessment of Dust from Demolition and Construction (IAQM, 2024).
- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (TII, 2011).
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII, 2009).
- Clean Air Strategy for Ireland (Government of Ireland April 2023).

- UK Department of Environment Food and Rural Affairs (DEFRA) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG (16) (DEFRA 2018).
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) – LA 105 Air Quality (UKHA, 2019).
- World Health Organization (WHO) Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide Global Update 2005 (WHO 2005).

10.1.2 Statement of Authority

This section of the EIAR has been prepared by Shaun Doolin and reviewed by Eoin O'Sullivan, both of whom are Environmental Scientists with MKO. Shaun was an Environmental Scientist with a B.A. (Hons) in Geography and M.Sc. (Hons) in Environmental Science from Trinity College Dublin. Shaun has over 2 years' experience in private practice, where he has completed numerous assessments for EIAs and has experience undertaking air quality assessments and composing a variety of EIAR chapters; particularly relating to wind energy. Eoin O'Sullivan is a Project Director with MKO; with over 14 years' experience in the environmental sector. Eoin has wide experience in the project management of large-scale infrastructural projects, including the management and productions of Environmental Impact Statements (EISs)/EIARs, particularly within the wind energy sector.

10.1.3 Limitations and Difficulties Encountered

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

10.2 Air Quality

10.2.1 Relevant Legislation

In 1996, the Air Quality Framework Directive (96/62/EC) 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) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) 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) 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), 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) as amended by the Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016).

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality and cleaner air for Europe) (as amended by Directive EU 2015/1480) 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 $PM_{2.5}$ (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 PM_{10}) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 10-1 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 ($\mu g/m^3$) 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).

10.2.2 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 10-1, the assessment thresholds in Table 10-2, the ozone limits and assessment thresholds in Table 10-3 and Table 10-4 respectively.

Table 10-1 Limit values of the CAFE Directive 2008/50.EC, Source: https://airquality.ie/information/air-quality-standards)

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m^3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of Human Health	1 hour	350	132	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	47	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m^3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	7.5	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	7.5	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	105	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	21	Annual mean	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of ecosystems	Calendar year	30	16	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
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	Protection of human health	calendar year	0.5		Annual mean	1st Jan 2005

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m^3)	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Carbon Monoxide	Protection of human health	8 hours	10,000	8620	Not to be exceeded	1st Jan 2005
Benzene	Protection of human health	calendar year	5	1.5	Annual mean	1st Jan 2010

Table 10-2 Assessment Thresholds from CAFE Directive 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/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
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	-

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
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 10-3 presents the target values and long-term target value for ozone and Table 10-4 details the threshold values for Ozone.

Table 10-3 Target values for Ozone defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Long-term Target Value from 2020
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 10-4 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 $\mu g/m^3$
Alert Threshold	1-hour average	240 $\mu g/m^3$

10.2.2.1 Air Quality and Health

In September 2023, the EPA published 'Air Quality in Ireland 2022' which reports that although air quality in Ireland is generally good, there are concerning localised issues. Fine particulate matter ($PM_{2.5}$) from solid fuel combustion and nitrogen dioxide (NO_2) from vehicle emissions are the main pollutants. People's health and the health of our environment is impacted by these pollutants.

The European Environmental Agency (EEA) Report, 'Air Quality in Europe – 2023 Report' highlights the negative effects of air pollution on human health across the EU. The report concluded that in 2021 in the EU-27 member countries, 253,000 deaths were attributable to exposure to $PM_{2.5}$ concentrations above the World Health Organisation (WHO) guideline level of 5 µg/m^3, 52,000 deaths were attributable to exposure to NO_2 concentrations above the WHO's guideline level of 10 µg/m^3 and 22,000 deaths were attributable to short-term exposure to O_3 concentrations above 70 µg/m^3. These emissions, along with others including sulphur oxides, carbon monoxide, benzene and lead are produced during fossil fuel-based electricity generation and traffic in various amounts, depending on the fuel and technology used. Whilst there is the potential of such emissions to be generated from the construction, operational and decommissioning phases of the Proposed Development mitigation measures will be implemented at this site to reduce the impact from dust and vehicle emissions, which are discussed in Section 10.2.4 below.

10.1.1.1.1 *Clean Air Strategy for Ireland 2023*

Ireland's Clean Air Strategy 2023[1] 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, 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 us to continue to evolve our 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.

[1] *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 2023 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 the Climate Action Plan 2023 is referenced, while Climate Action Plan 2024 is currently the latest revision. The targets of the Climate Action Plan 2024 and the Green Deal are to deliver net-zero GHG emissions by 2050 and reduce GHG emissions to at least 55% by 2030, compared to 1990 levels.

10.2.2.2 Air Quality Zones

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 with population greater than 15,000;
- Zone D: Remainder of the country.

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

10.2.2.3 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 2022' was published by the EPA in 2023. 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 below.

10.2.2.4 Dust

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) 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 (2024) guidance to reflect their different potential impacts. These are:

- Demolition (There are no demolition works required for any phase of the Proposed Development)
- Earthworks.
- Construction.
- Trackout.

The magnitude of dust generating activities is divided into 'Large', 'Medium' or 'Small' scale depending on the nature of the activities involved. The earthwork requirements as outlined in Appendix 4-2 of this EIAR results in the classification of the Wind Farm Site as 'Large' for Earthworks and Construction activities. The Grid Connection falls under the classification of 'Medium' for Earthworks and 'Small' for Construction due to the lower volumes of construction material required. The number of heavy-duty vehicle movements per day, as outlined in Section 15.1 in Chapter 15 Material Assets of this EIAR, results in the classification of the Wind Farm Site as 'Large' and Grid Connection as 'Medium' 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 site activities.

10.2.2.4.1 *Defining the Sensitivity of the Area*

For the purposes of this assessment, high sensitivity receptors are residential properties and dust sensitive ecological habitats. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. There are no medium sensitivity receptors within 250m of the Wind Farm Site and Grid Connection.

The IAQM (2014) 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

Sensitivities of People to Dust Soiling Effects

Dust soiling effects can occur for a distance of 250m from works areas, but the majority of deposition occurs within the first 50m (IAQM, 2024). Table 10-5 below identifies the sensitivity of an area to dust soiling effects on people and their properties, relative to different receptor sensitivities.

Table 10-5 Sensitivity of the Area to Dust Soiling Effects on People and Property. Guidance on the Assessment of Dust from 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 receptors to the health effects of PM_{10}, the IAQM (2024) guidance recommends the use of sensitivities 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 10-6below identifies the sensitivity of an area to human health effects of PM_{10}, relative to different receptor sensitivities.

Table 10-6 Sensitivity of the Area to Human Health Impacts. Guidance on the Assessment of Dust from 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

Sensitivities of Receptors to Ecological Effects

Dust deposition due to earthworks, construction and trackout has the potential to physically and chemically affect sensitive habitats and plant communities. Table 10-7below identifies the sensitivity bands to be used when assessing ecological impacts from dust deposition.

Table 10-7 Sensitivity of the Area to Ecological Impacts. Guidance on the Assessment of Dust from Construction (IAQM, 2024)

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

There are no high sensitive receptors, as described by the IAQM (2024) guidance within 50m of the Wind Farm Site and Grid Connection. Therefore, dust impacts on ecological receptors have been scoped out from this assessment.

10.2.2.4.2 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 10-8, Table 10-9 and Table 10-10 provide a method of assigning the level of risk for each activity.

Table 10-8 Risk of Dust Impacts - Earthworks (IAQM, 2024)

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

Table 10-9 Risk of Dust Impacts - Construction

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

Table 10-10 Risk of Dust Impacts - Trackout

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 significance rating of environmental effects from the EPA classification terminology as presented in Table 1-2 of Chapter 1 of this EIAR have been correlated with the equivalent risk rating from Table 10-8 to Table 10-10 above.

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

EPA Term	EPA Description	Risk Rating
Imperceptible	An effect capable of measurement but without significant consequences	Negligible
Slight	An effect which causes noticeable changes in the	Low

EPA Term	EPA Description	Risk Rating
	character of the environment without affecting its sensitivities	
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 Proposed Development is summarised in Section 10.2.4 below.

10.2.3 Baseline Air Quality

The air quality in the vicinity of the Wind Farm Site and Grid Connection site is typical of that of rural areas in the southwest 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 2022'* was published by the EPA in September 2023. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D.

10.2.3.1 Sulphur Dioxide (SO_2)

Sulphur dioxide data for Edenderry, Kilkitt, Cork Harbour, Shannon Estuary/Askeaton and Letterkenny in 2022 is presented in Table 10-12.

Table 10-12 Average Sulphur Dioxide Data for Zone D Sites in 2022

Parameter	Measurement
Annual Mean	5.0 µg/m^3
Hourly values > 350	0
Hourly max (Average)	83.6 µg/m^3
Daily values > 125	0
Daily max (Average)	22.8

During the 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 83.6 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 that SO_2 values at the Wind Farm Site and Grid Connection is similar or lower than those recorded for the Zone D sites above.

10.2.3.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, dust from soil and road surfaces, construction works and industrial emissions. The EPA report[2] provides annual mean PM_{10} concentration for sixteen Zone D towns, Tipperary Town, Carrick-on-Shannon/Askeaton, Enniscorthy, Birr, Askeaton, Macroom, Castlebar, Cobh Carrignafoy, Claremorris, Kilkitt, Cavan, Roscommon Town, Edenderry, Mallow, Longford, Cobh Cork Harbour and Killarney. Particulate matter (PM_{10}) data for 2022 is presented in Table 10-13 Average Particulate Matter (PM10) Data for Zone D Sites in 2022.

Table 10-13 Average Particulate Matter (PM_{10}) Data for Zone D Sites in 2022

Parameter	Measurement
Annual Mean	12.7 µg/m^3
% Data Capture (Average)	93.2%
Values > 50 ug/m^3	Max 10
Daily Max (Average)	56.5 µg/m^3

Notes: [1-] PM_{10} daily limit for the protection of human health: No more than 35 days >50 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was exceeded on 40 days, which is greater 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 Edenderry where the PM_{10} daily limit was exceeded on 10 no. occasions. In the EPA 2022 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 that PM_{10} values at the Wind Farm Site and Grid Connection is similar or lower than those recorded for the Zone D sites above.

10.2.3.3 Nitrogen Dioxide (NO_2)

Nitrogen dioxide data for Emo Court, Birr, Castlebar, Carrick-on-Shannon, Kilkitt and Edenderry in 2022 is presented in Table 10-14.

Table 10-14 Average Nitrogen Dioxide Data for Zone D Sites in 2022

Parameter	Measurement
Annual Mean (Average)	7.4 µg/m^3
NO_2 Values >200	0
Values > 140 (UAT)	1
Values >100 (LAT)	4
Hourly Max. (Average)	87.3 µg/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 4 no. times during the monitoring

[2] *EPA (2023). Air Quality in Ireland 2022.*

period in Emo Court, Co. Laois and the upper assessment threshold of 140 µg/m^3 was exceeded once during the monitoring period, also in Emo Court, Co. Laois. Both did not exceed the 18 days limit during the monitoring period. In 2022, no other monitoring locations in Zone D had exceedances in the lower and upper assessment thresholds of 100 and 140 µg/m^3. The average hourly max. NO_2 value of 87.3 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 and Grid Connection is similar or lower than those recorded for the Zone D sites above.

10.2.3.4 Carbon Monoxide (CO)

The EPA report[2] provides rolling 8-hour carbon monoxide concentrations for Birr, a Zone D site. Carbon Monoxide data for 2022 is presented in Table 10-15.

Table 10-15 Carbon Monoxide Data for Birr - Zone D Site in 2022

Parameter	Measurement
Annual Mean	0.8 mg/m^3
Median	0.7 mg/m^3
% Data Capture	95.9%
Values > 10	0
Max	3.4 mg/m^3

The average concentration of carbon monoxide was 0.8 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 2008/69/EC. It is expected based on professional judgement that hat CO values at the Wind Farm Site and Grid Connection site is similar or lower than those recorded for the Zone D site above.

10.2.3.5 Ozone (O_3)

The EPA report provides rolling 8-hour ozone concentrations for seven Zone D sites, Emo Court, Kilkitt, Carnsore Point, Mace Head, Castlebar, Valentia and Malin Head. Ozone (O_3) data for 2022 is presented in Table 10-16. As can be observed from Table 10-16, there were 17. No. exceedances of the maximum daily eight-hour mean limit of 120 µg/m^3. The CAFÉ Directive stipulates that this limit should not be exceeded on more than 25 days per calendar year averaged over 3 years. It is expected based on professional judgement that O_3 values at the Wind Farm Site and Grid Connection is similar or lower than those recorded for the Zone D sites below.

Table 10-16 Average Ozone Data for Zone D Sites in 2022

Parameter	Measurement
Annual Mean	61.7 µg/m^3
Median	62.2 µg/m^3
% Data Capture	89.5%
Average No. of days > 120 µg/m^3	17 days

10.2.3.6 Dust

There are no statutory limits for dust deposition in Ireland. However, EPA guidance suggests that a deposition of 10 mg/m^2/hour can generally be considered as posing a soiling nuisance. This equates to 240 mg/m^2/day. The EPA recommends a maximum daily deposition level of 350 mg/m^2/day when measured according to the TA Luft Standard 2002. This limit value can also be implemented with regard to dust impacts from construction activities associated with the Proposed 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 on-site activities such as excavation and backfilling. Construction traffic movements 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 10.2.4 below.

10.2.4 Likely and Significant Effect and Associated Mitigation Measures

The likely effects on the Air Quality are assessed using the criteria as set out in the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, May 2022) and described in section 1.7 of Chapter 1.

10.2.4.1 'Do-Nothing' Effect

If the Proposed Development were not to proceed, the Wind Farm Site and Grid Connection will continue to function as they do at present, with no changes to the current land-use and air quality. The impact of this is considered neutral in the context of the EIAR. If the Proposed Development were not to proceed, there would be no potential for negative effects on human health during the construction and decommissioning phases of the Proposed Development related to potential emissions to air of dust. However, the opportunity to capture an even greater part of County Clare'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.

10.2.4.2 Construction Phase

10.2.4.2.1 *Exhaust Emissions*

Wind Farm Site

The construction of turbines, the meteorological mast, 110kV electrical substation, site roads, road widening works along the local road and other Wind Farm Site infrastructure (as outlined in Chapter 4 of this EIAR) and extraction of material from the proposed borrow pits will require the operation of construction vehicles and plant on site and the transport of workers to and from the site. Exhaust emissions associated with vehicles and plant such as NO_2, Benzene and PM_{10} will arise as a result of construction activities. This potential effect will be restricted to the duration of the construction phase as outlined in Section 4.4 of Chapter 4 of this EIAR and localised to works areas as described in Chapter 4 of this EIAR. Therefore, this is considered a Short-term, Slight, Negative effect. Mitigation measures to reduce this effect are presented below and will be implemented in full.

Grid Connection

The construction of the Grid Connection cabling route to the Ardnacrusha 110kV substation will require the use of construction machinery, thereby giving rise to exhaust emissions. This is a Temporary, Slight, Negative effect, which will be reduced through use of the best practice mitigation measures as presented below and will be implemented in full.

Transport to and from Wind Farm Site and Grid Connection

The transport of turbine components, construction materials, waste and workers to and from the Wind Farm Site and Grid Connection, (see Section 15.1 of this EIAR), will also give rise to exhaust emissions associated with the transport vehicles. This constitutes a Short-term, Moderate, Negative effect in terms of air quality. Mitigation measures in relation to exhaust emissions are presented below and will be implemented in full.

Mitigation

- All construction vehicles and plant used onsite during the construction phase will be maintained in good operational order. If a vehicle requires repairs this work will be carried out at an appropriate offsite location, thereby minimising any emissions that arise.
- Turbines components will be transported to the Wind Farm Site on specified routes only (see Chapter 15 Material Assets), unless otherwise agreed with the Planning Authority.
- All machinery and vehicles will be switched off when not in use and not left idling.
- The majority of aggregate materials for the construction of the Proposed Development will be obtained from the borrow pits on site. This will significantly reduce the number of delivery vehicles accessing the Wind Farm Site, thereby reducing the amount of emissions associated with vehicle movements.
- Deliveries of aggregate materials that cannot be source from the onsite borrow pits will be sourced from local quarries which will reduce the distance of these deliveries, thereby reducing the effect to traffic and transport in the wider area.
- The Materials Recovery Facility (MRF) f will be as close as possible to the Wind Farm Site and Grid Connection to reduce the amount of emissions associated with vehicle movements.

Residual Effect

The residual effect from the construction phase and the implementation of the above mitigation measures will result in a Temporary-to-Short-term, Slight, Negative effect.

Significance of Effects

Based on the evaluation above there will be no significant direct or indirect effects on air quality due to the construction of the Proposed Development.

10.2.4.2.2 *Dust Emissions*

Wind Farm Site

The construction of turbines and associated foundations and hard-standing areas, 110kV electrical substation, meteorological mast, access roads, temporary construction compound, underground cabling, site drainage, tree felling, and all ancillary works and apparatus will give rise to dust emissions.

The majority of the construction materials for the proposed Wind Farm Site will be won onsite from the temporary borrow pits, where an estimated 151,000m^3 of materials will be extracted. The removal of the topsoil followed by its transportation and deposition at the spoil management area during the construction phase will give rise to dust emissions.

In order to accommodate the delivery of turbine components, accommodation works will be required at 3 no. locations along the R465 Regional Road in the townlands of Aharinaghbeg and Kilmore, Co. Clare. Works associated with the accommodation works will give rise to localised dust emissions.

The IAQM (2024) methodology for *the Assessment of Dust from Demolition and Construction* as discussed in Section 10.2.2.4 above is used to assess the potential risk to sensitive receptors from dust deposition. Dust deposition impacts can occur for a distance of 250m from works areas, but the majority of deposition occurs within the first 50m (IAQM, 2024). The High Sensitive Receptors were identified using a constraints mapping process, and detailed and updated planning searches which informed the project sensitive receptor dataset.

- There are 0 no. High Sensitive Receptors located within 20m of the proposed Wind Farm Site footprint;
- There is 1 no. High Sensitive Receptor within 50m of the proposed Wind Farm Site footprint;
- There are 2 no. High Sensitive Receptors within 100m of the proposed Wind Farm Site footprint;
- There are 24 no. High Sensitive Receptors within 250m of the proposed Wind Farm Site footprint.
- The 12 O'Clock Hills walking trail which is a Low Sensitive Receptor is within 250m of the proposed Wind Farm Site footprint.

Table 10-17 below identifies sensitivity of the area to dust soiling effects on people and property surrounding the development footprint of the Wind Farm Site to dust soiling effects, as described in Section 10.2.2.4 above. The overall sensitivity of the area to dust soiling effects is considered to be Low.

Table 10-17 Sensitivity of the Area to Dust Soiling Effects on People and Property from Wind Farm Site construction works. 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 sensitivity of people in the area surrounding the development footprint of the Wind Farm Site to the health effects of PM_{10}, as described in Section 10.2.2.4 above. The overall sensitivity of the area to human health effects of PM_{10} is considered to be Low.

Table 10-18 Sensitivity of the Area to Human Health Impacts from Wind Farm Site 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

As identified in Section 10.2.2.4 above, the Wind Farm Site is classified as 'Large' for Earthworks, Construction and Trackout activities. Therefore, when combined with the sensitivity of the area, using Table 10-8 to Table 10-10 above as guidance, the pre-mitigation risk of impacts from the Wind Farm Site is summarised in Table 10-19 below.

Table 10-19 Summary Dust Risk Table for Wind Farm Site Activities

Potential Impact	Dust Emission Risk			
	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	N/A	N/A	N/A

The overall risk of dust emissions impacts with no mitigation applied for the major dust generating activities during the construction phase of the Wind Farm Site is Low. Therefore, the potential effects of dust from the construction phase of the Wind Farm Site are considered to be equivalent to Short-term, Slight Negative effects.

Grid Connection

The construction of the proposed Grid Connection will give rise to dust emissions. It is proposed to provide construction grade materials for the Grid Connection infrastructure from local licenced quarries.

The number of sensitive receptors within 250m from Grid Connection works areas and their likely risk of dust impacts during the construction works, as highlighted in the IAQM (2024) methodology discussed above are as follows:

- There are 35 no. Sensitive Receptors located within 20m from the proposed Grid Connection route;
- There are 92 no. Sensitive Receptors located within 50m of the proposed Grid Connection route;
- There are 127 no. Sensitive Receptors located within 100m of the proposed Grid Connection route;
- There are 311 no. Sensitive Receptors located within 250m of the proposed Grid Connection route, one of which is also located within 250m of the proposed Wind Farm Site footprint (H492).

Table 10-20 below identifies the sensitivity of the area surrounding the development footprint of the Grid Connection to dust soiling effects, as described in Section 10.2.2.4 above. The overall sensitivity of the area to dust soiling effects is High due to the number of sensitive receptors within 20m of the proposed Grid Connection route.

Table 10-20 Sensitivity of the Area to Dust Soiling Effects from Grid Connection construction works 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 10-21 below identifies the sensitivity of people in the area surrounding the development footprint of the Grid Connection to the health effects of PM_{10}, as described in Section 10.2.2.4 above. The overall sensitivity of the area to human health effects of PM_{10} is Low.

Table 10-21 Sensitivity of the Area to Human Health Impacts from Grid Connection 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

As identified in Section 10.2.2.4 above, the Grid Connection is classified as 'Medium' for Earthworks, 'Small' for Construction, and 'Medium' for Trackout activities. Therefore, when combined with the sensitivity of the area, using Table 10-8 to Table 10-10 above as guidance, the pre-mitigation risk of impacts from the Grid Connection is summarised in Table 10-22.

Table 10-22 Summary Dust Risk Table for Grid Connection Activities

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

The overall risk of dust emissions impacts with no mitigation applied for the major dust generating activities during the construction phase of the Grid Connection is Medium. Therefore, the potential effects of dust from the construction phase of the Grid Connection are considered to be equivalent to Temporary, Moderate Negative effects. Mitigation measures to reduce this effect are presented below and will be implemented in full.

Mitigation & Monitoring Measures for the Proposed Development

- 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 will be carried out along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, , increased runoff.
- All plant and materials vehicles for the Proposed Development will be stored in dedicated areas within the Wind Farm Site.
- Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.
- Turbines and construction traffic will be transported to the Wind Farm Site on specified haul routes only.
- Grid Connection infrastructure will be transported to the Grid Connection on specified haul routes only.
- Construction materials for the proposed Grid Connection and a small volume for the proposed Wind Farm Site will be sourced locally from licenced quarries.
- The agreed haul route road adjacent to the Wind Farm Site will be checked weekly by the Site Manager for cleanliness and cleaned as necessary.
- The roads adjacent to the Wind Farm Site entrances will be checked weekly for damage/potholes and repaired as necessary.
- The transportation of materials from the borrow pits around the Wind Farm Site will be covered by tarpaulin or similar covered vehicles.
- The transportation of construction materials from locally sourced quarries for the proposed Grid Connection infrastructure and a small volume for the proposed Wind Farm Site will be covered by tarpaulin .
- In periods of extended dry weather, excavated material will be dampened prior to transport to the spoil management areas.
- Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by an appropriately licensed waste contractor. The MRF facility will be local to the Proposed Development to reduce the amount of emissions associated with vehicle movements
- The Construction and Environmental Management Plan (CEMP) submitted as part of this planning application will be a key contract document and will be implemented in full by the contractor throughout the construction phase. (see Appendix 4-3). The CEMP includes dust suppression measures.

Residual Impact

With the implementation of the above, the Wind Farm Site is considered to have a Short-term Not Significant Negative effect on air quality brought about by dust emissions generated during the construction activities.

The Grid Connection is considered to have a Temporary Slight Negative effect on air quality brought about by dust emissions generated during the construction activities.

Significance of Effects

The effects on air quality from dust emissions during the construction phase will be Not Significant for the Wind Farm Site and Slight for the Grid Connection.

10.2.4.3 Operational Phase

10.2.4.3.1 *Exhaust Emissions*

Exhaust emissions associated with the operational phase of the Proposed Development will arise from machinery and vehicles that are intermittently required onsite for maintenance. This will give rise to a Long-term, Not Significant, Negative effect due to the localised and intermittent nature of the maintenance. Mitigation measures to reduce this effect are presented below and will be implemented in full.

Mitigation

- 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 on-site vehicles will have their engines switched off.

Residual Effect

Long-term Imperceptible Negative effect.

Significance of Effects

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

10.2.4.3.2 *Air Quality*

The Proposed Development, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, will result in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2). The production of renewable energy from the Proposed Development will have a Long-term, Significant, Positive effect on air quality, and thus not requiring mitigation. Further details on the carbon dioxide savings associated with the Proposed Development are presented in Section 11.5.2 of Chapter 11.

Residual Effect

Long-term Significant Positive effect for all turbines within the range. For the purposes of the air quality assessment this EIAR, an output range of between 5.7 MW and 7.2 MW per turbine has been chosen to calculate the power output of the proposed 9-turbine wind energy development, which would result in an estimated installed capacity of between 51.3 MW and 64.8 MW of electricity that doesn't directly emit carbon dioxide (CO_2), oxides of nitrogen (NO_x), or sulphur dioxide (SO_2). Whilst there are potentially turbines with a greater MW output capacity , the residual effect will not be altered.

Significance of Effects

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

10.2.4.3.3 *Human Health*

Whilst the operational phases of the Proposed Development will give rise to minor increases in vehicle emissions, the implementation of the mitigation measures discussed in section 10.2.4.3.1 above, and good management practices will avoid, reduce or offset potential effects off-site. s. The potential for health effects are considered negligible as the potential for exhaust emissions will be limited and controlled through site layout design and mitigation measures.

Exposure to chemicals such as SO_2 and NO_x are known to be harmful to human health. The production of clean renewable energy from the Proposed 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 effect on human health. Further information on the impact of the Proposed Development on Human Health is contained in Chapter 5: Population and Human Health.

Residual Effect

Long-term Slight Positive effect.

Significance of Effects

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

10.2.4.4 Decommissioning Phase

The wind turbines proposed as part of the Wind Farm Site are expected to have a lifespan of 35 years. Following the end of this lifespan, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Wind Farm Site will be decommissioned fully as described at section 4.6 of chapter 4 of this EIAR.

A Decommissioning Plan is included as Appendix 4-6 of this EIAR for the decommissioning of the Proposed 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 magnitude. The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential effects. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed within this EIAR.

10.2.5 Cumulative Assessment

The potential effects on air quality of the Proposed Development alone and in combination with other plans and projects in the vicinity of the Wind Farm Site and Grid Connection were also considered as part of this assessment. The other plans and projects considered as part of this cumulative effect assessment are presented in Appendix 2-2 of this EIAR, with relevant developments within 1km of the Wind Farm Site and Grid Connection presented below in Table 10-23 below. This is in line with the Transport Infrastructure Ireland (TII) Publication Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107, December 2022. Forestry operations in the townlands of Ballyvorgal, Snaty, Cloontra, Knockshanvo, and Formoyle have also been considered as part of this cumulative assessment. The cumulative project list was prepared following a review of planning files (An Board Pleanala and Local Authority files), EPA search engines, development plans and National Roads Office/Transport Infrastructure Ireland road projects.

Table 10-23 Other Plans and Projects with the potential to cause cumulative effects on air quality alone and in combination with the Proposed Development.

Planning Ref.	Description	Decision
315239	Proposed wind farm development consisting of approximately 10 wind turbines, 110kV substation, grid connection and site infrastructure within the townlands of Oatfield, Crag, Cloontra West, Derryvinnaan, Cloontra, Cloonheerea, Mountrice, Cloghera, Drumsillagh (Merritt), Drumsillagh (Parker), Kyle and Gortacullin, Co. Clare.	Application lodged December 2023.
2338	To relocate the existing Ardnacrusha-Tulla 38kV line	Granted by Clare County Council 17/04/2023
18567	To complete existing landfill site (originally started under previous planning exemptions), by filling the existing poor quality agricultural land with stone and soil in order to raise the level of the ground by approx. 1.0m, including ancillary site works.	Granted by Clare County Council 07/10/2018

The nature of the Proposed Development is such that, once operational, it will have a Long-term, Moderate, Positive effect on the air quality. Emissions of carbon dioxide (CO_2), oxides of nitrogen (NO_x), sulphur dioxide (SO_2) or dust emissions during the operational phases of the Proposed Development and other developments, listed in Appendix 2-2 of Chapter 2 and in Table 10-20 above, will be minimal, relating to the use of operation and maintenance vehicles onsite, and therefore there will be a Long-term, Imperceptible, Negative cumulative effect on air quality. During the construction phase of the Proposed Development and considering the potential cumulative effect with other existing and proposed plans and projects listed in Appendix 2-2 and within 1km of the Wind Farm Site and Grid Connection, there will be exhaust emissions from construction plant and machinery and potential dust emissions associated with all construction activities. Should these other plans and projects be constructed at the same time as the Proposed Development there will be a Short-term Slight Negative cumulative effect on air quality due to vehicular and dust emissions.

10.2.6 Conclusion

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 Proposed Development.

Construction Phase

The Proposed Development is considered to have a Short-term Not Significant Negative effect on air quality brought about by exhaust emissions generated during the construction activities.

The Wind Farm Site is considered to have a Short-term Not Significant Negative effect on air quality brought about by dust emissions generated during the construction activities.

The Grid Connection is considered to have a Temporary Slight Negative effect on air quality brought about by dust emissions generated during the construction activities.

Operational Phase

The Proposed Development is considered to have a Long-term Imperceptible Negative effect on air quality brought about by exhaust emissions generated during the operational phase.

The Proposed Development, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, will result in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2). The production of renewable energy from the Proposed Development will have a Long-term, Significant, Positive effect on air quality

Decommissioning Phase

The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential effects.

The residual effects are of the same significance for all permutations within the range. The same mitigation will be applied regardless of the turbine installed within the range.