9 CLIMATE (AIR QUALITY)

9.1 INTRODUCTION

This chapter identifies, describes and assesses the likely air quality impacts of the proposed Mount Avenue large-scale residential development (LRD) located at lands in Castletown, Dundalk, Co. Louth.

A full description of the development is available in Chapter 3. This Chapter should be read in conjunction with Chapter 14 Material Assets Traffic and Transport and the Traffic and Transportation Assessment submitted with the planning application.

9.2 EXPERTISE & QUALIFICATIONS

This chapter was completed by Tanmay Gojamgunde. Tanmay is an environmental consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He holds a MSc in Air Pollution Management and Control from the University of Birmingham and has also completed BTech in Environmental Engineering. As part of the MSc, he worked on 'The Impact of bus-fleet electrification on air quality in Birmingham' utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi's first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and extends to broader aspects of environmental engineering.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

9.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

9.3.1 The Proposed Development

The proposed development is a large-scale residential development (LRD) on located on lands at Mount Avenue, Castletown, Dundalk, County Louth. The proposed development consists of residential units in a mix of houses, duplexes and apartments.

A detailed description of development can be found in Chapter 3 of this Report.

9.3.2 Cumulative Development

A review of the planned and permitted projects within the vicinity of the site was undertaken in order to identify developments with the potential for cumulative construction phase impacts.

There was a site identified which may have coinciding construction phases with that of the proposed development:

- LCC Reg. Ref. 2460792

9.4 ASSESSMENT METHODOLOGY

9.4.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- Guidance on the Assessment of Dust from Demolition and Construction v2.2 (Institute of Air Quality Management [IAQM] (hereafter referred to as the IAQM Guidelines) (IAQM, 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020); and
- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland [TII], 2022).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

9.4.2 Criteria for Rating of Impacts

9.4.2.1 Ambient Air Quality Standards

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

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

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

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for

pollutants to be achieved by 1 January 2030, these are more closely aligned with the WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11 December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

In relation to the proposed development, the applicable limit values are for nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). Table 9-1 outlines the limit values pre-2030 and post-2030 for the specified pollutants.

Pollutant	**Directive (EU) 2024/2881 Annex I Table 2**		**Directive (EU) 2024/2881 Annex I Table 1**	
	Limit Type	**Limit Value (to be attained by 2026 and applicable until 2030)**	**Limit Type**	**Limit Value (to be attained by 2030)**
Nitrogen Dioxide (NO_2)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m^3
	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as $PM_{2.5}$)	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m^3
	Annual limit for protection of human health	25 µg/m^3	Annual limit for protection of human health	10 µg/m^3

Table 9-1 Ambient Air Quality Limit Values (Source : AWN Consulting, 2025).

9.4.2.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (Table 9-2), the IT4 targets by 2030 and the final targets by 2040 (Table 9-2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m^3. The

strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*".

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that *"Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II."*

These assessment thresholds relate to monitoring of ambient air quality by Member States, where *"exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years."*

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	24-hour limit for protection of human health	-	-	25 µg/m³
	Annual limit for protection of human health	20 µg/m³	-	10 µg/m³
PM (as PM_{10})	24-hour limit for protection of human health	75 µg/m³	50 µg/m³	45 µg/m³
	Annual limit for protection of human health	30 µg/m³	20 µg/m³	15 µg/m³
PM (as $PM_{2.5}$)	24-hour limit for protection of human health	37.5 µg/m³	25 µg/m³	15 µg/m³
	Annual limit for protection of human health	15 µg/m³	10 µg/m³	5 µg/m³

Table 9-2 WHO Air Quality Guidelines 2021 (Source: WHO, 2021)

The applicable air quality limit values for the purposes of this assessment are those set out in Table 9-1. The limit values stipulated in Table 2 of Annex I of Directive (EU) 2024/2881 are applicable for the construction phase and Opening Year 2027 for the proposed development. The limit values stipulated in Table 1 of Annex I of Directive (EU) 2024/2881 are applicable for the Design Year 2042 for the proposed development.

9.4.2.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 9-1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-

Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

9.4.2.4 Air Quality & Traffic Significance Criteria

The Transport Infrastructure Ireland (TII) guidance document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do-Nothing scenario. The TII significance criteria are outlined in Table 4.9 of Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022) and reproduced in Table 9-3 below. These criteria have been adopted for the proposed development to predict the impact of NO_2, PM_{10} and $PM_{2.5}$ emissions as a result of the proposed development.

Long-term average concentration at receptor in assessment year	**% Change in concentration relative to Air Quality Limit Value (AQLV)**			
	1%	**2-5%**	**6-10%**	**>10%**
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Table 9-3 Air Quality & Traffic Significance Criteria (Source: TII, 2022)

As per Table 9-3 a neutral effect is one where a change in concentration at a receptor is:

- 5% or less where the Opening Year, without the proposed development, annual mean concentration is 75% or less of the standard; or
- 1% or less where the Opening Year, without the proposed development, annual mean concentration is 94% or less of the standard.

Where an effect does not meet the criteria for neutral, as described above, the effect can either be positive or negative. The TII guidance (TII, 2022) states that "*the evaluation of significance of effects for the operational phase should be undertaken for the Opening Year only as the Design Year is likely to show lower total pollutant concentrations and changes in concentration*" (TII, 2022).

Non-significant effects (i.e. of local importance only) are 'neutral' or 'slight' changes in concentrations while significant effects can be changes in pollutant concentrations that are either 'moderate' or 'substantial'. However, the TII guidance (TI, 2022) states that these must be considered in the context of the project and 'moderate' or 'substantial' increases are not necessarily always significant effects.

The impact descriptors in Table 9-3 are used to describe the impact at each modelled receptor location, and the significance of the impacts is then determined, aligning with the terminology in the EPA guidelines (EPA, 2022). Whilst it may be determined that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, an overall judgement should be made of whether the proposed development is 'significant' or 'not significant' in terms of air quality. Factors to consider when determining the overall significance of a proposed development are provided in Table 4.10 of the TII guidance (TII, 2022).

9.4.3 Construction Stage

9.4.3.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) 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. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts.

These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The criteria for determining the category for the works involved are outlined in Table 9-4, these are based on the IAQM guidance (IAQM, 2024). The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Dust Emission Magnitude		
Small	**Medium**	**Large**
Demolition		
• 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	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material • Demolition activities 6 – 12 m above ground level	• 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
Earthworks		
• 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 • Earthworks during wetter months	• 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 3 – 6 m in height	• 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 >6 m in height
Construction		

Dust Emission Magnitude		
Small	**Medium**	**Large**
• Total building volume <12,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >75,000 m^3 • On-site concrete batching • Sandblasting
Trackout (Truck Movements)		
• <20 HDV (>3.5 t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50 m	• 20 – 50 HDV (>3.5 t) outward movements in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 – 100 m	• >50 HDV (>3.5 t) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m

Table 9-4 IAQM Criteria to Determine Dust Emissions Magnitude

The sensitivity of the area must be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. 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. **Error! Reference source not found.** outlines the criteria for determining the sensitivity of the area to dust soiling and dust-related human health effects as per the IAQM guidance (IAQM, 2024).

Sensitivity of the Area to Dust Soiling Effects on People and Property					
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
Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from Source (m)**			
			<20	**<50**	**<100**	**<250**
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10 - 100	**Low**	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

Table 9-5 Criteria for Determining the Sensitivity of the Area (Source: Adapted from IAQM, 2024)

Once the dust emission magnitude and sensitivity of the area have been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 9-6.

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

Table 9-6 IAQM Criteria to Determine Risk of Dust Impacts (Source: Adapted from IAQM,2024)

9.4.3.2 Construction Phase Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being '*affected*' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

DBFL Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 14 Material Assets -Transportation and Transport of this EIAR. As per Chapter 14, it has been determined by DBFL Consulting Engineers that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality with respect with human or ecological receptors.

9.4.4 Operational Stage

9.4.4.1 Operational Phase Traffic Assessment

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 9.4.3.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. DBFL Consulting Engineers has prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 14 (Material Assets- Transportation). The proposed development will result in a greater than 1000 AADT increase on several road links in the vicinity of the proposed development site. As a result, an assessment of traffic related emissions was conducted. Additionally, traffic associated with other cumulative developments in the vicinity of the proposed development was included in the figures supplied to ensure a full cumulative assessment was conducted. See Traffic and Transport Assessment and Chapter 14 (Material Assets -Transportation) for further details.

The impact of traffic emissions on air quality is assessed for both human and ecological receptors within 200 m of impacted roads as per the TII PE-ENV-01106 guidance (TII, 2022). The following sections describe the methodology for each assessment.

The impact to air quality as a result of changes in traffic is assessed at sensitive human receptors in the vicinity of affected roads. These are discussed in further detail within Section 9.5.3.2 and shown graphically in Figure 9.3.

The TII guidance (2022) states that modelling should be conducted for NO_2, PM_{10} and $PM_{2.5}$ for the Base, Opening and Design Years for both the Do Nothing, i.e. assuming the proposed development is not in place, and Do Something (with the proposed development in place) scenarios. Modelling of operational NO_2, PM_{10} and $PM_{2.5}$ concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2025).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), heavy duty vehicles (HDV) AADT (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The Default fleet mix option was selected along with the Intermediate Case fleet data for cars, ICE Sales Ban for LGVs and EU target projections for HGVs, as per TII Guidance (TII 2022, TII 2025). The Intermediate Case assumes a linear interpolation between the Business-as-Usual case – where current trends in vehicle ownership continue and the Climate Action Plan (CAP) case – where adoption of low emission light duty vehicles occurs. The ICE Sales Ban 2035 option for LGVs presents a sales ban on new combustion engine vehicles to be implemented by 2035. The EU Targets projections for HGVs represents interim targets for emissions from sales of new HGVs. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII 2025).

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII guidance (2022) also states that impacts to sensitive ecology due to traffic emissions should be considered. Consideration should be given to designated sites within 2km of the proposed development. However, a detailed assessment is only required at a local level, where there is a designated site within 200m of impacted road links. The TII guidance (TII, 2022) notes that only sites that are sensitive to nitrogen and acid deposition need to be included in the assessment. It is not necessary to include sites, for example that have been designated as a geological feature or water course. There are no designated ecological sites within 200m of the site or impacted road links and

therefore no assessment was required as there is no potential for significant impacts to the designated sites due to changes in air quality.

9.4.4.2 Traffic Data used in Modelling Assessment

Traffic flow information is detailed in Table 9-7 as obtained from DBFL Consulting Engineers for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the Opening Year 2027 and Design Year 2042 were provided. The traffic data included traffic associated with the development site and other cumulative sites as relevant (see Chapter 14 Material Assets - Transportation for further details).

The modelling assessment has been undertaken for road links that were within 200 m of receptors. Background concentrations have been included as per Section 9.5.2 of this chapter based on available EPA background monitoring data (EPA, 2024).

Road Name	Speed (kph)	Opening Year		Design Year	
		Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Castletown Road (Link A)	50	8885 (469)	9488 (501)	10145 (536)	12878 (680)
Castletown Road (Link D)	50	10502 (592)	11368 (641)	12005 (677)	13299 (750)
Mount Avenue Road (W) (Link F)	50	4854 (127)	5039 (132)	5462 (143)	7518 (196)
Mound Avenue Road (S) (Link G)	50	2729 (153)	2909 (163)	3012 (169)	5010 (280)
Carrickmacross Road (Link H)	50	7574 (292)	7757 (299)	8636 (332)	9744 (375)
Mount Avenue internal Road (Link J)	60	0 (0)	1205 (63)	0 (0)	4926 (259)
Junction between R934 and N53 (Link K)	30	12797 (1687)	12965 (1710)	14863 (1960)	15880 (2094)
Castletown Road (Link O)	30	12376 (721)	12976 (756)	14165 (825)	16884 (984)
Castletown Road (Link P)	80	12399 (677)	13000 (710)	14181 (774)	16910 (923)
Castletown Road (Link V)	50	11381 (499)	11988 (525)	12985 (569)	15741 (690)
Castletown Road (Link W)	50	10581 (597)	10853 (612)	12099 (682)	13886 (783)
Castletown Road (Link Z)	50	10485 (592)	10785 (609)	11988 (677)	13811 (780)

Table 9-7 Traffic Data used in Operational Phase Air Quality Assessment (Source: AWN Consulting, 2025)

9.5 RECEIVING ENVIRONMENT

9.5.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO,

2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 66 km south of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 9.1). For data collated during five representative years (2020 - 2024), the predominant wind direction is westerly to south-westerly; the mean wind speed over the long term 30-year averaging period 1991 - 2020 is 5.3 m/s (Met Éireann, 2025).

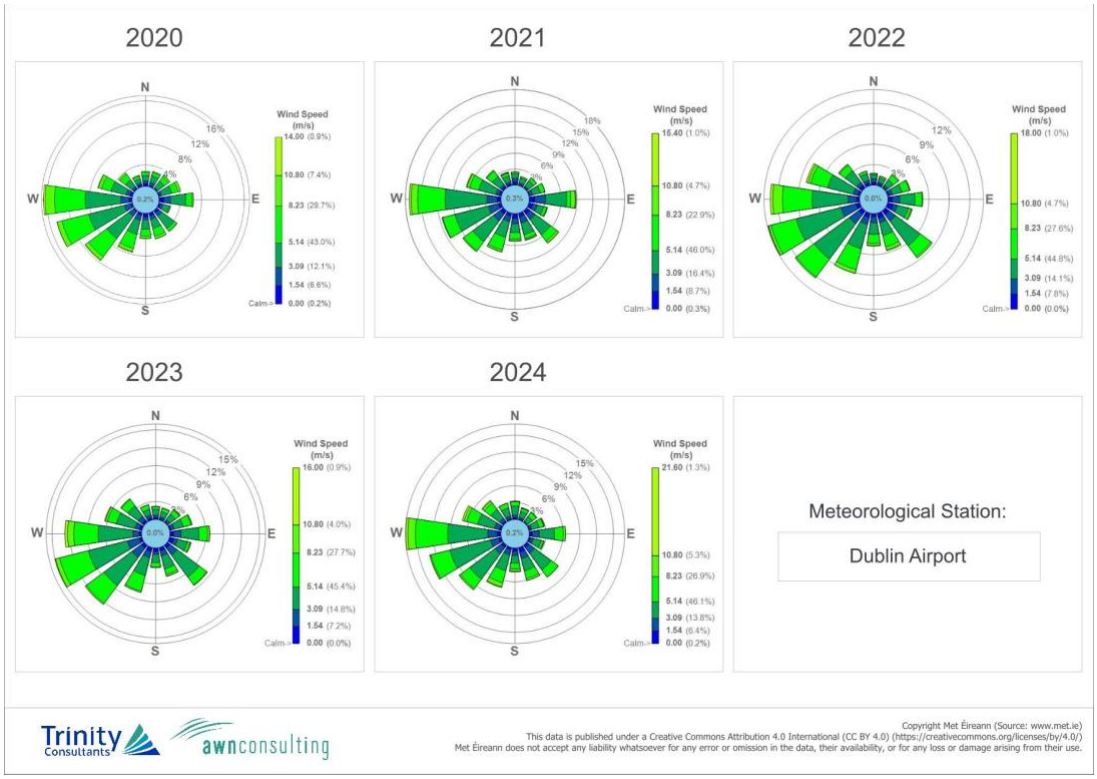

Figure 9.1 Wind Roses for Dublin Airport Meteorological Station (Source: AWN Consulting, 2025)

9.5.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is *'Air Quality In Ireland 2024'* (EPA, 2025). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2025). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone C (EPA, 2025). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts

for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). The use of publicly available long-term datasets is recommended by TII in their PE-ENV-0016 guidance (2022). This use of long-term data sets is preferred over on-site baseline air monitoring surveys as it gives a better indication of long-term trends in air quality. The use of long-term monitoring data from the EPA is considered appropriate for determining the background air quality in the area of the proposed development.

Continuous monitoring by the EPA is carried out at a number of monitoring stations within Zone C; these include urban background sites, roadside (traffic) sites and suburban background sites. It is necessary to select monitoring stations that are representative of the site location. Not all monitoring stations are considered suitable for determining background pollutant concentrations and must be reviewed on a case-by-case basis to determine the most appropriate EPA monitoring sites for the current assessment.

The EPA, on their website (EPA, 2025), state that background sites generally represent overall area-wide exposure more closely than roadside sites. Roadside monitoring sites are heavily influenced by traffic emissions and are not considered representative of area-wide pollutant levels.

The full suite of EPA Zone C monitoring locations were reviewed. Suburban background was determined to be the most representative background for the area of the proposed development. Influences from traffic emissions will be captured within the traffic modelling assessment and therefore, suburban background concentrations give the best indication of other, non-traffic derived sources of pollutants.

9.5.2.1 NO_2

Long-term NO_2 monitoring was carried out at the representative Zone C suburban background locations of Dundalk, Kilkenny Seville Lodge and Portlaoise over the period 2020 – 2024 (EPA, 2025).

Long term average NO_2 concentrations are significantly below the annual average limit of 40 µg/m^3 (see Table 9-8). Average results range from 4 – 11 µg/m^3 over the period 2020 – 2024 for the Zone C sites. The 5-year average NO_2 concentration for all representative sites suggests an average concentration of no more than 8 µg/m^3 as a background concentration. Based on the above information, a conservative estimate of the current background NO_2 concentration for the region of the proposed development is 8 µg/m^3.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Dundalk (Zone C Suburban Background)	Annual Mean NO_2 (µg/m^3)	10	11	10	9	10
	1-hr Mean > 200 µg/m^3 (days)	1	0	1	1	0
Kilkenny Seville Lodge (Zone C Suburban Background)	Annual Mean NO_2 (µg/m^3)	4	4	5	4	5
	1-hr Mean > 200 µg/m^3 (days)	0	0	0	0	0
Portlaoise (Zone C Suburban Background)	Annual Mean NO_2 (µg/m^3)	8	8	9	8	8
	1-hr Mean > 200 µg/m^3 (days)	0	0	0	0	0

Table 9-8 Trends In Air Quality - Nitrogen Dioxide (NO_2) (Source: EPA, 2025)

9.5.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at the representative Zone C suburban background location of Athlone, Carlow Town, Dundalk, Kilkenny Seville Lodge, Portlaoise and Tralee over the period 2020 – 2024 (EPA, 2025).

Long-term PM_{10} concentrations are in compliance with the annual average limit value of 40 µg/m³. Levels range from 10 - 18 µg/m³ over the five-year period at the Zone C sites, with at most 11 exceedances (in Tralee) of the 24-hour limit value of 50 µg/m³ (35 exceedances are permitted per year) (EPA, 2025). The 5-year average PM_{10} concentration at the sites suggests an average concentration of no more than 13 µg/m³ (Table 9-9). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 13 µg/m³.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone (Suburban Background)	Annual Mean PM_{10} (µg/m³)	16	12	12	12	12
	24-hr Mean > 50 µg/m³ (days)	3	2	3	-	3
Carlow Town (Suburban Background)	Annual Mean PM_{10} (µg/m³)	11	10	11	10	11
	24-hr Mean > 50 µg/m³ (days)	1	0	0	-	0
Dundalk (Suburban Background)	Annual Mean PM_{10} (µg/m³)	13	12	12	13	12
	24-hr Mean > 50 µg/m³ (days)	2	0	2	-	0
Kilkenny Seville Lodge (Suburban Background)	Annual Mean PM_{10} (µg/m³)	18	17	18	14	12
	24-hr Mean > 50 µg/m³ (days)	1	2	2	-	0
Portlaoise (Suburban Background)	Annual Mean PM_{10} (µg/m³)	12	11	12	11	12
	24-hr Mean > 50 µg/m³ (days)	0	1	0	-	0
Tralee (Suburban Background)	Annual Mean PM_{10} (µg/m³)	16	17	18	15	15
	24-hr Mean > 50 µg/m³ (days)	7	11	14	-	5

Table 9-9 Trends In Air Quality - PM_{10} (Source: EPA, 2025)

9.5.2.3 $PM_{2.5}$

Average $PM_{2.5}$ levels in Athlone, Carlow Town, Portlaoise and Tralee over the period 2020 - 2024 ranged from 6 - 13 µg/m³, (EPA, 2025). The overall annual average concentration for this 5-year period is 9 µg/m³ (Table 9-10). Based on this information, a background $PM_{2.5}$ concentration in the region of the proposed development of 9 µg/m³ has been used in the assessment.

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone (Suburban Background)	Annual Mean $PM_{2.5}$ (µg/m³)	12	9	9	8	8.8
Carlow Town (Suburban Background)	Annual Mean $PM_{2.5}$ (µg/m³)	7	7	7	6	6.9

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Portlaoise (Suburban Background)	Annual Mean $PM_{2.5}$ ($\mu g/m^3$)	8	8	8	7	8.1
Tralee (Suburban Background)	Annual Mean $PM_{2.5}$ ($\mu g/m^3$)	12	13	13	10	11

Table 9-10 Trends In Air Quality – $PM_{2.5}$ (Source: EPA, 2025)

9.5.2.4 Summary

Based on the above information the air quality in the Zone C area, including Mount Avenue is generally good, with concentrations of the key pollutants generally well below the relevant limit values set out in Table 2 of Annex I of Directive (EU) 2024/2881. The current pollutant concentrations at the majority of monitoring sites are also in compliance with the 2030 limit values set out in Table 1 of Annex I in Directive (EU) 2024/2881 and the clean air strategy, however, concentrations are exceeding or approaching the limit values at some sites. Further measures will be needed at a national scale to reduce air pollution in future years. The EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2025).

9.5.3 Sensitivity of the Receiving Environment

9.5.3.1 Construction Stage

The impact to air quality due from construction phase activities is assessed at sensitive receptors within 250 m of the development boundary. In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 9.2). There are 10-100 high sensitivity residential properties within 20m of the site boundary, there are a further 10-100 within 50m and >100 properties within 100m of the site boundary.

Figure 9.2 shows the sensitive receptors in the construction dust study area within 250m of the site.

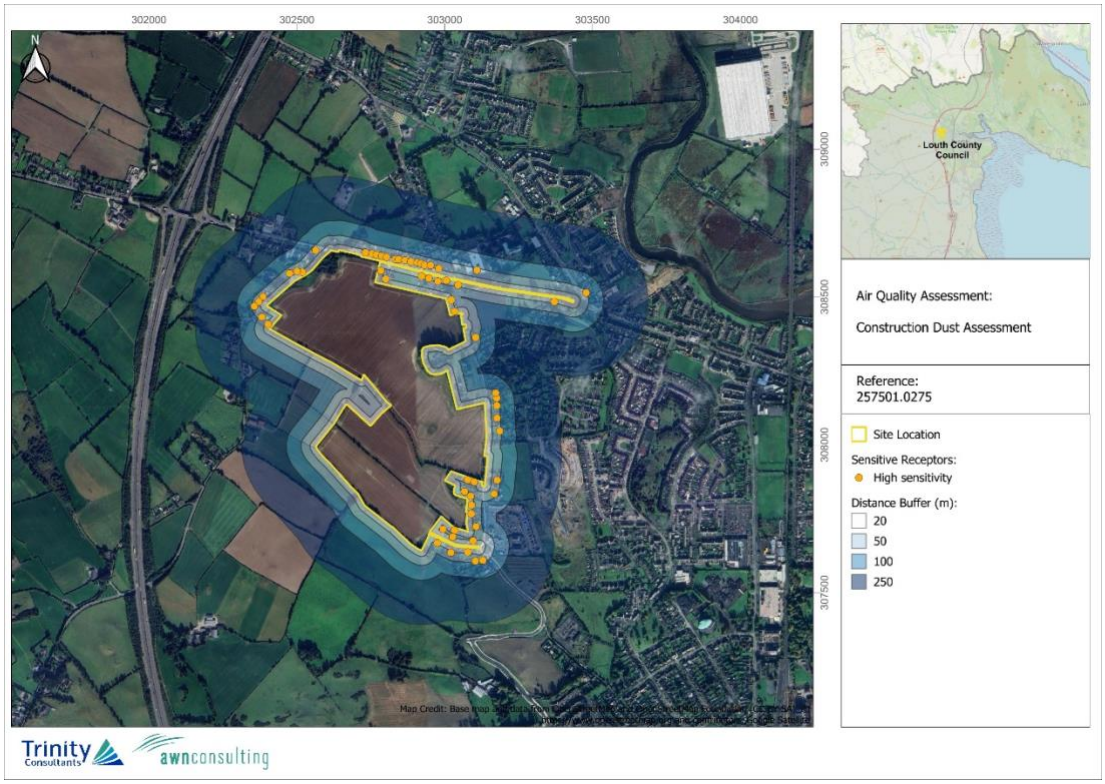

Figure 9.2 Sensitive Receptors within 250m of Site (Source: AWN Consulting, 2025)

9.5.3.2 Operational Stage

The impact to air quality due to changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022) states that a proportionate number of representative receptors, which are located in areas which will experience the highest concentrations or greatest improvements because of the proposed development, are to be included in the modelling. The TII criteria state that receptors within 200 m of impacted road links should be assessed; roads which are greater than 200 m from receptors will not impact pollutant concentrations at that receptor (TII, 2022). The TII guidance (2022) defines sensitive receptor locations for the purposes of modelling annual mean pollutant concentrations as: residential housing, schools, hospitals, care homes and short term-accommodation such as hotels, i.e. locations where members of the public are likely to be regularly present for 24 hours. A total of 12 no. high sensitivity residential receptors (R1-R12) were included in the modelling assessment (see Figure 9.3)

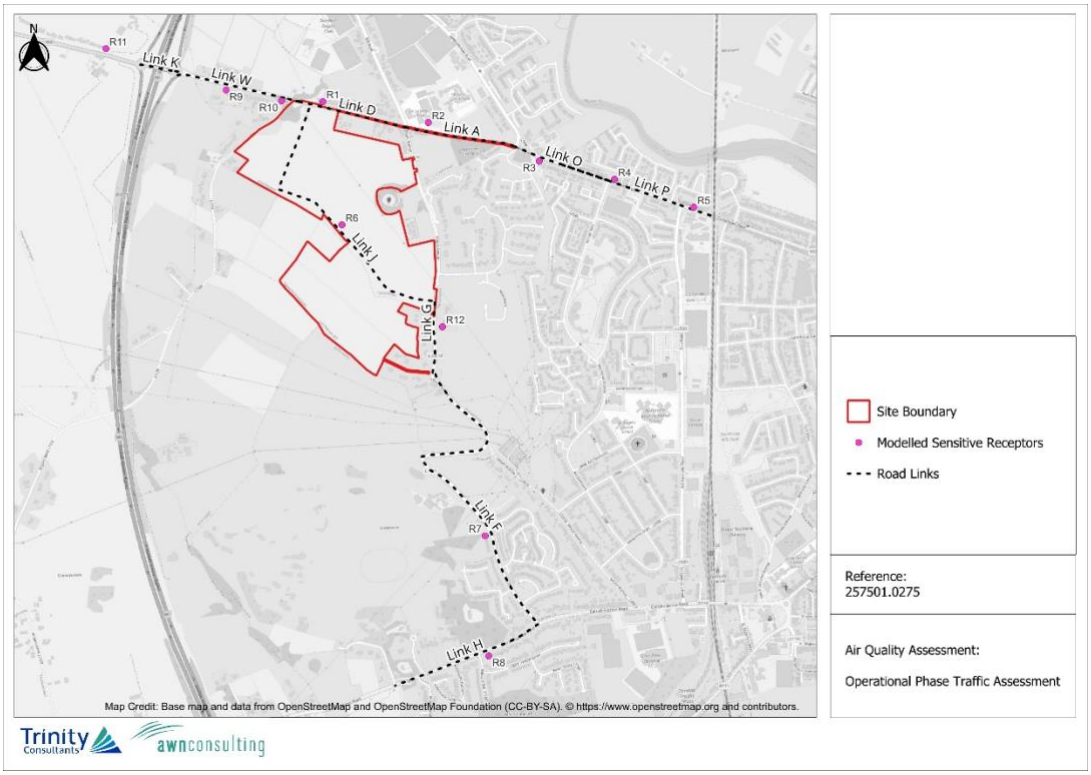

Figure 9.3 Location of Sensitive Receptors used in Operational Phase Air Quality Assessment (Source: AWN Consulting, 2025)

9.6 THE 'DO NOTHING' SCENARIO

In the Do-Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 9.7.2 and it was found to be ***direct, long-term, negative*** and ***slight*****,** which is overall ***not significant***.

9.7 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

9.7.1 Construction Stage

9.7.1.1 Construction Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2024). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Dublin Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 9.5.1). A review of historical 30-year average data for Dublin Airport indicates that on average 200 days per year have rainfall over 0.2 mm (Met Éireann, 2025a). Therefore, it can be determined that over 54% of the time dust generation will be negligible.

To determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (Section 9.5.3). The major dust generating

activities are divided into four types within the IAQM (IAQM, 2024) guidance to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (movement of heavy vehicles).

9.7.1.2 Determining the Potential Dust Emission Magnitude

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity has been determined below for the proposed development using the criteria in Table 9-4.

Activity	Dust Emission Magnitude	Justification
Demolition	N/A	No demolition proposed
Earthworks	Medium	Total site area is between 18,000 and 110,000 m^2
Construction	Large	More than 75,000 m^3 of building to be constructed
Trackout	Medium	Approximately 20-50 outward vehicle movements per day from construction site activities

Table 9-11 Dust Emission Magnitude (Source: AWN Consulting, 2025)

9.7.1.3 Determining the Sensitivity of the Area

In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 9.2). There are 10-100 high sensitivity residential properties within 20m of the site boundary, there are a further 10-100 within 50m and >100 properties within 100m of the site boundary. Based on these receptor numbers and using the IAQM criteria in Table 9-5, the sensitivity of the area to dust soiling impacts from the proposed development is high.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 14 $\mu g/m^3$. There are 10-100 high sensitivity receptors within 20 m of the proposed development boundary. Based on the IAQM criteria outlined in Table 9-5 the worst-case sensitivity of the area to dust-related human health effects is low.

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant, as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site, and 50 m from site access roads, up to 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. There are no sensitive ecological receptors that meet these criteria within the study area and there is no potential for impacts to sensitive ecology from construction dust emissions and no further assessment is required.

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High	High	High
Human Health	N/A	Low	Low	Low

Table 9-12 Sensitivity of the Area (Source: AWN Consulting, 2025)

9.7.1.4 Determining the Risk of Dust Impacts

As detailed in Table 9-6, the predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation.

Table 9-13 Risk of Dust Impacts used to Define Site-Specific Mitigation (Source: AWN Consulting, 2025)

below provides a summary of the risk of dust impacts for the proposed development.

There is at most a high risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the proposed works. Without mitigation in place, construction dust will have a ***direct, negative, short-term*** and ***slight*** impact on air quality, which is overall, ***not significant***. As a result, best practice dust mitigation measures associated with high-risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors (see Section 9.8.1).

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium Risk	High Risk	High Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

Table 9-13 Risk of Dust Impacts used to Define Site-Specific Mitigation (Source: AWN Consulting, 2025)

9.7.1.5 Construction Stage Traffic Assessment

There is also the potential for traffic emissions to impact air quality with respect to human health in the short-term over the construction phase, particularly, due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII assessment criteria in Section 9.4.3.2.

Therefore, it can be determined that the construction stage traffic will have an ***imperceptible, neutral, short-term*** and ***not significant*** impact on air quality.

9.7.2 Operational Stage

9.7.2.1 Operational Stage Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated due to the development. The traffic data has included specific cumulative developments within the area to provide for a worst-case assessment and to assess potential cumulative impacts (see Transport Assessment and Chapter 14 Material Assets - Transportation, both prepared by DBFL Consulting Engineers for further details).

The traffic data includes the Do Nothing (DN) scenario and Do Something (DS) scenario. The impact of NO_2, PM_{10} and $PM_{2.5}$ emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the impacted road links. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do Nothing' scenario, which assumes that the proposed development is not in place in future years, to determine the degree of impact.

Traffic related air emissions have the potential to impact air quality which can affect human health. The following details the results of the air dispersion modelling assessment of traffic emissions to determine the impact to human health. The predicted pollutant concentrations have been compared against the ambient air quality limit values set out in Table 9-1. The limit values set out in Table 2 of Annex I in Directive (EU) 2008/50/EC are applicable to the Opening Year 2027 and limit values set out in Table 1 of Annex I in Directive (EU) 2024/2881 are applicable to the Design Year 2042 as the assessment year is post-2030.

NO_2

The results of the NO_2 modelling are shown in Table 9-14. In the Opening Year 2027, predicted annual mean concentrations of NO_2 are in compliance with the annual mean limit value of 40 µg/m^3, reaching at most 29% of the limit. In addition, the TII guidance (2022) states that the hourly limit value for NO_2 of 200 µg/m^3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m^3. As predicted NO_2 concentrations are significantly below 60 µg/m^3 (Table 9-14), it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations. Some increases in NO_2 concentrations are predicted at the worst-case receptor assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 9-14). Concentrations are predicted to increase by at most 0.20 µg/m^3 at receptor R6. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 0.50% at receptor R6. The other receptor in the area will experience similar or lesser impacts and all increases are considered 'neutral' as per the TII criteria in Table 9-3.

In the Design Year 2042, predicted annual mean NO_2 concentrations are in compliance of the limit value of 20 µg/m^3 at the worst-case receptors assessed, reaching at most 42% of the limit. The proposed development will result in a 'neutral' increase in NO_2 concentrations according to the TII significance criteria in Table 9-3, with concentrations increasing by at most 0.06 µg/m^3 as a result of the proposed development (at receptor R6, Table 9-14), which is an increase of 0.30% when compared with the applicable annual mean limit value for NO_2. Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	9.99	25%	10.16	25%	0.17	0.43%	Neutral
R2	9.10	23%	9.18	23%	0.08	0.20%	Neutral
R3	11.41	29%	11.57	29%	0.16	0.40%	Neutral
R4	10.78	27%	10.91	27%	0.13	0.33%	Neutral
R5	10.82	27%	10.97	27%	0.15	0.38%	Neutral
R6	8.00	20%	8.20	21%	0.20	0.50%	Neutral
R7	8.72	22%	8.75	22%	0.03	0.07%	Neutral
R8	9.26	23%	9.29	23%	0.03	0.07%	Neutral
R9	10.00	25%	10.05	25%	0.05	0.13%	Neutral
R10	9.24	23%	9.28	23%	0.04	0.10%	Neutral
R11	8.18	20%	8.18	20%	0.00	0.00%	Neutral
R12	8.37	21%	8.39	21%	0.02	0.05%	Neutral
Receptor	**Impact Design Year**						

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	8.18	41%	8.20	41%	0.02	0.10%	Neutral
R2	8.10	41%	8.12	41%	0.02	0.10%	Neutral
R3	8.35	42%	8.38	42%	0.03	0.15%	Neutral
R4	8.19	41%	8.21	41%	0.02	0.10%	Neutral
R5	8.25	41%	8.28	41%	0.03	0.15%	Neutral
R6	8.00	40%	8.06	40%	0.06	0.30%	Neutral
R7	8.06	40%	8.08	40%	0.02	0.10%	Neutral
R8	8.11	41%	8.12	41%	0.01	0.05%	Neutral
R9	8.18	41%	8.21	41%	0.03	0.15%	Neutral
R10	8.11	41%	8.13	41%	0.02	0.10%	Neutral
R11	8.02	40%	8.02	40%	0.00	0.00%	Neutral
R12	8.03	40%	8.05	40%	0.02	0.10%	Neutral

Table 9-14 Predicted Annual Mean NO_2 Concentrations (µg/m³) (Source: AWN Consulting, 2025)

PM_{10}

The results of the PM_{10} modelling can be seen in Table 9-15 for the Opening Year 2027 and Design Year 2042.

In the Opening Year 2027, annual mean PM_{10} concentrations are in compliance with the annual mean limit value of 40 µg/m³ reaching at most 44% of the limit. In the Design Year 2042 annual mean PM_{10} concentrations are also in compliance with the annual mean limit value of 20 µg/m³ reaching at most 88% of the limit. In addition, the proposed development will not result in any days of exceedance of the daily PM_{10} limit value (Table 9-1) in both the opening and design years.

The changes in PM_{10} concentrations as a result of the proposed development can be assessed relative to the 'Do Nothing' (DN) levels. In the Opening Year 2027 annual PM_{10} concentrations will increase by at most 0.21 µg/m³ at receptor R6, this is a 0.53% increase when compared with the annual mean limit value of 40 µg/m³. The other receptor in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 9-3.

In the Design Year 2042 the proposed development will result in a maximum increase of 0.78 µg/m³ at receptor R6, which is a 3.90% increase when compared with the annual mean limit of 20 µg/m³. The changes in concentrations in the Design Year are considered 'neutral' to 'slight adverse' based on the TII criteria in Table 9-3.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	16.25	41%	16.43	41%	0.18	0.45%	Neutral
R2	15.23	38%	15.32	38%	0.09	0.23%	Neutral
R3	17.40	44%	17.57	44%	0.17	0.43%	Neutral
R4	16.34	41%	16.45	41%	0.11	0.27%	Neutral
R5	17.13	43%	17.30	43%	0.17	0.43%	Neutral
R6	14.00	35%	14.21	36%	0.21	0.53%	Neutral
R7	14.77	37%	14.80	37%	0.03	0.08%	Neutral

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R8	15.38	38%	15.42	39%	0.04	0.10%	Neutral
R9	16.26	41%	16.32	41%	0.06	0.15%	Neutral
R10	15.40	39%	15.44	39%	0.04	0.10%	Neutral
R11	14.19	35%	14.19	35%	0.00	0.00%	Neutral
R12	14.41	36%	14.44	36%	0.03	0.07%	Neutral
Receptor	**Impact Design Year**						
	DN	**% of AQLV**	**DS**	**% of AQLV**	**DS-DN**	**% Change of AQLV**	**Description**
R1	16.28	81%	16.52	83%	0.24	1.20%	Neutral
R2	15.25	76%	15.58	78%	0.33	1.65%	Slight Adverse
R3	17.42	87%	17.67	88%	0.25	1.25%	Neutral
R4	16.46	82%	16.64	83%	0.18	0.90%	Neutral
R5	17.15	86%	17.62	88%	0.47	2.35%	Slight Adverse
R6	14.00	70%	14.78	74%	0.78	3.90%	Neutral
R7	14.76	74%	15.05	75%	0.29	1.45%	Neutral
R8	15.39	77%	15.57	78%	0.18	0.90%	Neutral
R9	16.29	81%	16.63	83%	0.34	1.70%	Slight Adverse
R10	15.42	77%	15.63	78%	0.21	1.05%	Neutral
R11	14.18	71%	14.19	71%	0.01	0.05%	Neutral
R12	14.40	72%	14.67	73%	0.27	1.35%	Neutral

Table 9-15 Predicted Annual Mean PM_{10} Concentrations (µg/m^3) (Source: AWN Consulting, 2025)

$PM_{2.5}$

In relation to changes in $PM_{2.5}$ concentrations as a result of the proposed development, the results of the assessment can be seen in Table 9-16 for the modelled Opening Year 2027 and Design Year 2042.

In the Opening Year 2027, predicted annual mean concentrations of $PM_{2.5}$ are in compliance with the annual mean limit value of 25 µg/m^3 reaching at most 47% of the limit. There is predicted to be an increase in $PM_{2.5}$ concentrations at the worst-case receptor assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 9-16). Concentrations are predicted to increase by at most 0.11 µg/m^3 at receptor R6. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 0.44% at receptor R6. The other receptor in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 9-3.

In the Design Year 2042, predicted annual mean $PM_{2.5}$ concentrations are in exceedance of the limit value of 10 µg/m^3 at all receptors assessed. Concentrations are in exceedance of the limit in both the Do Nothing and Do Something scenarios as a result of the estimated background concentrations. For the purposes of this assessment, it has been assumed that the current estimated background pollutant concentrations are applicable for both the opening and design years with no decreases in future background concentrations allowed for. There will be some decreases in background concentrations in future years, however, at present there is no explicit methodology available for estimating future year background concentrations and therefore, as a conservative approach, the current estimated background concentrations have been applied to future years. The current estimated background $PM_{2.5}$ concentration is 10 µg/m^3 (see Section 9.5.2) which is exactly the future annual mean limit value for $PM_{2.5}$. Hence, concentrations reach at most 119% of the annual mean limit value. The proposed development will result in a 'neutral' to 'substantial adverse' increases in

$PM_{2.5}$ concentrations according to the TII significance criteria in Table 9-3, with concentrations increasing by at most 0.42 µg/m^3 as a result of the proposed development (at receptor R6, see Table 9-16), which is an increase of 4.2% when compared with the annual mean limit value of 10 µg/m^3 for $PM_{2.5}$.

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	11.18	45%	11.28	45%	0.10	0.40%	Neutral
R2	10.65	43%	10.69	43%	0.04	0.16%	Neutral
R3	11.77	47%	11.86	47%	0.09	0.36%	Neutral
R4	11.31	45%	11.38	46%	0.07	0.28%	Neutral
R5	11.64	47%	11.73	47%	0.09	0.36%	Neutral
R6	10.00	40%	10.11	40%	0.11	0.44%	Neutral
R7	10.41	42%	10.42	42%	0.01	0.04%	Neutral
R8	10.73	43%	10.74	43%	0.01	0.04%	Neutral
R9	11.19	45%	11.22	45%	0.03	0.12%	Neutral
R10	10.73	43%	10.76	43%	0.03	0.12%	Neutral
R11	10.10	40%	10.10	40%	0.00	0.00%	Neutral
R12	10.22	41%	10.23	41%	0.01	0.04%	Neutral
Receptor	**Impact Design Year**						
	DN	**% of AQLV**	**DS**	**% of AQLV**	**DS-DN**	**% Change of AQLV**	**Description**
R1	11.21	112%	11.34	113%	0.13	1.30%	Moderate Adverse
R2	10.66	107%	10.84	108%	0.18	1.80%	Moderate Adverse
R3	11.80	118%	11.93	119%	0.13	1.30%	Moderate Adverse
R4	11.38	114%	11.48	115%	0.10	1.00%	Moderate Adverse
R5	11.68	117%	11.93	119%	0.25	2.50%	Substantial Adverse
R6	10.00	100%	10.42	104%	0.42	4.20%	Moderate Adverse
R7	10.41	104%	10.56	106%	0.15	1.50%	Moderate Adverse
R8	10.74	107%	10.84	108%	0.10	1.00%	Moderate Adverse
R9	11.22	112%	11.40	114%	0.18	1.80%	Substantial Adverse
R10	10.75	108%	10.87	109%	0.12	1.20%	Moderate Adverse
R11	10.09	101%	10.10	101%	0.01	0.10%	Neutral
R12	10.22	102%	10.36	104%	0.14	1.40%	Moderate Adverse

Table 9-16 Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m^3) (Source: AWN Consulting, 2025)

9.7.2.2 Significance of Predicted Changes in NO_2, PM_{10} and $PM_{2.5}$ Concentrations

As outlined in Section 9.4.2.4, the TII guidance (2022) states that the significance of effects should be assessed based on the opening year only. Non-significant effects are 'neutral' or 'slight' changes in concentrations while significant effects can be changes in pollutant concentrations that are either 'moderate' or 'substantial'. However, the TII guidance (2022) states that these must be considered in the context of the project and 'moderate' or 'substantial' increases are not necessarily always significant effects.

In relation to NO_2, PM_{10} and $PM_{2.5}$ the predicted changes in concentrations are 'neutral' in the Opening Year 2027. Therefore, the impact of the proposed development is not significant.

In the Design Year 2042, the proposed development will result in some increases in pollutants also, however, the primary contributor to pollutant concentrations is the estimated background concentration.

For the purposes of this assessment, it has been assumed that the current estimated background pollutant concentrations are applicable for both the opening and design years, with no decreases in future background concentrations allowed for. There will be some decreases in background concentrations in future years. However, at present there is no guidance-based methodology available for estimating future year background concentrations and therefore, as a conservative approach, the current estimated background concentrations have been applied to future years. The most affected

Due to the large uncertainty in future improvements in fleet composition and emissions, such as projected changes to vehicle registration and electric vehicle uptake, the future year emission rates utilised by the TII REM tool do not account for the full implementation of these measures. Predicted design year concentrations are therefore currently overly conservative as future emissions improvements are not fully taken into account, as well as no improvement in background concentrations being assumed.

As a result, the opening year predicted concentrations are the most appropriate for determining the significance of effects as per Section 9.4.2.4.

It can be concluded that the impact of traffic emissions on air quality and human health during the operational phase is ***long-term, direct, localised, negative*** and ***not significant*** in EIA terms.

The measures set out in the Clean Air Strategy for Ireland (Government of Ireland 2023) aim to work towards solutions to ensure that air pollution concentrations are reduced in order to comply with the future changes in limit values. Ireland will need to continue to implement and develop measures to ensure continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved. The estimated background concentrations used in the assessment are the largest contribution to predicted pollutant concentrations, rather than pollutant contributions associated with the proposed development. Strategies to improve air quality at a national level in future years will contribute to reducing background concentrations and therefore it is envisioned that air quality will improve in the future.

9.7.3 Cumulative

9.7.3.1 Construction Stage

There is the potential for cumulative construction dust impacts to nearby sensitive receptors if the construction phase of the proposed development coincides with that of other large-scale developments within 500 m of the site.

A review of the planned and permitted projects within the vicinity of the site was undertaken in order to identify developments with the potential for cumulative construction phase impacts. There was a site identified which may have coinciding construction phases with that of the proposed development:

- Mount Avenue Farrandreg (Planning Ref. 2460792)

There is a high risk of dust impacts associated with the proposed development (see Table 9-13). The dust mitigation measures outlined in Section 9.8.1 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development and the aforementioned developments are deemed ***short-term, direct, negative*** and ***not significant***.

9.7.3.2 Operational Stage

There is the potential for cumulative impacts to air quality during the operational phase as a result of traffic associated with other existing and permitted developments within the area. The traffic data provided for the operational stage air quality assessment included specific cumulative developments within the area (see Traffic and Transport Assessment and Chapter 14: Material Assets (Traffic & Transport) for further details).

The cumulative operational phase impact is assessed within Section 9.7.2.1 and was found to have a neutral impact on air quality as per the TII significance criteria (Table 9-3). The cumulative operational stage impact is ***long-term, localised, direct, negative*** and ***not significant***.

9.8 MITIGATION MEASURES (AMELIORATIVE, REMEDIAL OR REDUCTIVE MEASURES)

9.8.1 Construction Stage

The proposed development has been assessed as having a high risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 9.7.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a high risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. Mitigation measures for high-risk sites as recommended by IAQM construction dust guidance are detailed in

Mitigation Measure	Action
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	Highly Recommended
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	Highly Recommended
Display the head or regional office contact information	Highly Recommended
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in the IAQM Guidance. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	Highly Recommended
Site Management	
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Highly Recommended
Make the complaints log available to the local authority when asked.	Highly Recommended
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	Highly Recommended
Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the	Highly Recommended

Mitigation Measure	Action
interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	
Monitoring	
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	Highly Recommended
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked	Highly Recommended
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Highly Recommended
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	Highly Recommended
Preparing and Maintaining the Site	
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	Highly Recommended
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Highly Recommended
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period	Highly Recommended
Avoid site runoff of water or mud.	Highly Recommended
Keep site fencing, barriers and scaffolding clean using wet methods.	Highly Recommended
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	Highly Recommended
Cover, seed or fence stockpiles to prevent wind whipping.	Highly Recommended
Operating vehicle/machinery and sustainable travel	
Ensure all vehicles switch off engines when stationary – no idling vehicles.	Highly Recommended
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	Highly Recommended
Impose and signpost a maximum-speed-limit of 24 kmph on surfaced and 16 kmph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	Highly Recommended
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Highly Recommended
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	Highly Recommended

Mitigation Measure	Action
Operations	
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems	Highly Recommended
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate	Highly Recommended
Use enclosed chutes and conveyors and covered skips.	Highly Recommended
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Highly Recommended
Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Highly Recommended
Waste management	
Avoid bonfires and burning of waste materials.	Highly Recommended
Measures Specific to Demolition	
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible to provide a screen against dust	Highly Recommended
Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	Highly Recommended
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	Highly Recommended
Bag and remove any biological debris or damp down such material before demolition.	Highly Recommended
Measures Specific to Earthworks	
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable	Desirable
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable.	Desirable
Only remove the cover in small areas during work and not all at once.	Desirable
Measures Specific to Construction	
Avoid scabbling (roughening of concrete surfaces) if possible.	Desirable
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	Highly Recommended
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Desirable
For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.	Desirable

Mitigation Measure	Action
Measures Specific to Trackout	
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	Highly Recommended
Avoid dry sweeping of large areas.	Highly Recommended
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Highly Recommended
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Highly Recommended
Record all inspections of haul routes and any subsequent action in a site logbook.	Highly Recommended
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	Highly Recommended
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Highly Recommended
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Highly Recommended
Access gates to be located at least 10 m from receptors where possible.	Highly Recommended

Table 9-17 Construction Phase Dust Mitigation Measures. (Source: Adapted from IAQM, 2024)

9.8.2 Operational Stage

The impact of the operational traffic associated with proposed development on air quality is predicted to be ***not significant*** with respect to the operational phase in the long term. Therefore, no site-specific mitigation measures are required.

9.9 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

9.9.1 Construction Stage

9.9.1.1 Air Quality

Once the dust mitigation measures outlined in Section 9.8.1 are implemented, the impact of the proposed development in terms of dust soiling will be ***direct, short-term, negative, localised*** and ***not significant*** at nearby receptors.

9.9.1.2 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be ***direct, short-term, negative, localised*** and ***not significant*** with respect to human health.

9.9.2 Operational Stage

9.9.2.1 Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2, PM_{10} and $PM_{2.5}$ at nearby sensitive receptors as a result of the proposed development will be 'neutral' in line with the TII assessment criteria (Table 9-3). Therefore, the operational phase impact to air quality is ***long-term, direct, negative*****,** and ***not significant***.

9.9.2.2 Human Health

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the TII assessment criteria which is based on the impacts in the opening year. Section 9.7.2.1 determined that the impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be ***localised, direct, long-term, negative*** and ***not significan*****t** for the opening year. However, Ireland will need to develop measures to ensure continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved.

9.9.3 Cumulative

9.9.3.1 Construction Stage

According to the IAQM guidance (2024) should the construction phase of the proposed development coincide with the construction phase of any other developments within 500m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. However, provided the mitigation measures outlined in Section 9.8.1, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted. Impacts are predicted to be ***direct, short-term, negative, localised*** and ***not significant***.

9.9.3.2 Operation Stage

Air dispersion modelling of operational traffic emissions associated with the proposed development and cumulative developments in the wider area was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2, PM_{10} and $PM_{2.5}$ at nearby sensitive receptors as a result of the proposed development in combination with cumulative developments will be neutral as per the TII descriptors in Table 9-3. Therefore, the operational phase impact to air quality is ***long-term, direct, negative*****,** and ***not significant***.

9.10 MONITORING

9.10.1 Construction Stage

The following monitoring measures are proposed to ensure the dust mitigation measures are working satisfactorily:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days). Monitoring shall ensure that the dust mitigation measures are working satisfactorily as construction works progress.

9.10.2 Operational Stage

There is no monitoring recommended for the operational phase of the proposed development as impacts to air quality are predicted to be ***not significant***.

9.11 REINSTATEMENT

This is not relevant to air quality.

9.12 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered when compiling this assessment.

9.13 CONCLUSION

This chapter has assessed the predicted impacts of the construction and operational phases of the proposed development on air quality. The cumulative impacts of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is not significant.