10 Air Quality

10.1 Introduction

No revisions were necessary to this EIAR chapter in responding to Dun Laoghaire - Rathdown County Council (DLR CC) decision to request Further Information dated 25th March 2026 in respect of LRD26A/0051/WEB.

10.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by Darragh Grant, Environmental Consultant with DNV. Darragh is an Environmental Impact Assessment (EIA) practicioner with a bachelor's degree in Zoology (University College Dublin) and a master's degree in Environmental & Climate Law (University College Dublin). Darragh has experience preparing EIA Screening Reports, Material Assets (Waste and Utilities), Interactions and Mitigation & Monitoring chapters of Environmental Impact Assessment Reports (EIARs)

This chapter has been reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with 12 years' experience, specialising in EIAs for strategic infrastructure, renewable energy, residential, industrial and pharmaceutical projects. Gráinne has a B.A, in Geography, Planning and Environmental Policy, an MSc in Environmental Policy and a Post Graduate Diploma in Project Management.

This chapter has been approved by Catherine Keogan, Technical Diretor and EIA Lead at DNV. Catherine is an environmental consultant with 37 years experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a bachelor's degree (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

10.2 Study Methodology

The study methodology adopted for this assessment is in line with accepted industry practices and relevant regulatory guidance. In accordance with the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022), the baseline air quality of the site and surrounding area has been characterized using publicly available Environmental Protection Agency (EPA) monitoring data. Air quality effects from the Proposed Development are then determined by a qualitative assessment of the nature and scale of dust and emission generating activities associated with the construction phase of the Proposed Development in accordance with relevant guidance (Institute of Air Quality Management (IAQM), 2024).

In addition to assessing the effect on people as a result of air quality, the effects on sensitive ecosystems must also be assessed as per Transport Infrastructure Ireland (TII) guidance (2022;2025). The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive') requires an Appropriate Assessment (AA) to be carried out where there is likely to be a significant effect upon a European protected site.

The TII Air Quality Guidance requires the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2km of the site.

The following internationally designated sites are within 2km of the Proposed Development:

- South Dublin Bay Special Area of Conservation (SAC)(000210)
- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA)(004024)

This study involved coordination with the ecologist preparing the Biodiversity Chapter and Natura Impact Statement (NIS) and should be read in conjunction with the Population and Human Health, Land and Soils, Biodiversity, Climate and Traffic Chapters of this EIAR, as well as the Appropriate

Assessment Screening/NIS, where potential impacts to the nearest Natura 2000 sites are further assessed.

10.2.1 Relevant Legislation and Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are as follows:

- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- European Union (Environmental Impact Assessment) Regulations 2020 (S.I. No. 191/2020);
- Guidelines for Planning Authorities and An Coimisiún Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government (DHPLG), 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (IAQM, 2024);
- TII Guidance Air Quality Assessment of Specialised Infrastructure Projects- PE-ENV-01106 and TII Road Emissions Model (REM) online calculator tool (TII, 2025); and
- TII Road Emissions Model (REM): Model Development Report-GE-ENV-01107 (TII, 2024).

10.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to human health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government (DEHLG) (2004) and the European Parliament and Council of the European Union have set limit values in ambient air for a range of air pollutants. 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 based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022 (S.I. No. 739/2022), which incorporate European Commission Directive 2008/50/EC. This Directive sets limit values for numerous pollutants of which nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$) are considered the most relevant to this assessment due to their association with traffic emissions and construction-related dust.

Directive 2008/50/EC also sets ambient air quality limit values for other pollutants including sulphur dioxide (SO_2), carbon monoxide (CO), and benzene. While these pollutants are acknowledged for completeness and regulatory compliance, they are not considered significant in the context of the Proposed Development, where traffic-related emissions such as NO_2 and PM are more relevant. These pollutants are typically associated with industrial activities, fuel combustion, or older vehicle fleets and are not expected to be emitted in significant quantities during either the construction or operational phases of the Proposed Development.

Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1993/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. In addition, Ireland is a signatory to the Gothenburg Protocol under the United Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air

Pollution (LRTAP). The Protocol sets national emission reduction commitments for key pollutants including SO_2, nitrogen oxides (NO_X), volatile organic compounds (VOCs), ammonia (NH_3) and $PM_{2.5}$. While it does not establish ambient air quality standards, it supports national and EU-level efforts to reduce transboundary air pollution and informs Ireland's air quality and emissions policy framework. VOCs and NH_3 are acknowledged for completeness but are not considered significant in the context of the Proposed Development. NH_3 emissions are primarily associated with agricultural activities, which are not relevant to the Proposed Development. VOCs may be present in small quantities during construction (e.g. from paints or sealants) but are not expected to contribute significantly to ambient outdoor air pollution. Therefore, these pollutants are not assessed further in this chapter.

The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$, SO_2, CO and benzene are set out in Table 10-1.

Pollutant	Regulation	Limit Type	Value
Dust Deposition	TA Luft (German VDI, 2002)	Annual average limit for nuisance dust	350 mg/m^2/day
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health-not to be exceeded more than 18 times/year	200 $\mu g/m^3$
		Annual limit for the protection of human health	40 $\mu g/m^3$
NO_X	2008/50/EC	Annual limit for the protection of vegetation	30 $\mu g/m^3$
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health-not to be exceeded more than 35 times/year	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health	40 $\mu g/m^3$ PM_{10}
Particulate Matter (as $PM_{2.5}$)-Stage 1	2008/50/EC	Annual limit for protection of human health	25 $\mu g/m^3$ $PM_{2.5}$
Particulate Matter (as $PM_{2.5}$)-Stage 2	2008/50/EC	Annual limit for protection of human health	20 $\mu g/m^3$ $PM_{2.5}$
Sulphur Dioxide (SO_2)	2008/50/EC	Hourly limit for the protection of human health -not to be exceeded more than 24 times/year	350 $\mu g/m^3$
		Daily limit for protection of human health-not to be exceeded more than 3 times/year	125 $\mu g/m^3$
Carbon Monoxide (CO)	2008/50/EC	Maximum daily 8-hour mean	10 mg/m^3
Benzene	2008/50/EC	Annual limit for protection of human health	5 $\mu g/m^3$

Table 10.1. Ambient Air Quality Standards and TA Luft

On the 14th of October 2024 the European Parliament and the Council of the European Union adopted a directive setting updated air quality standards across the EU. The directive aims to improve air quality across the EU by aligning standards with the latest World Health Organization (WHO) guidelines and reducing air pollution's health impacts by more than 55% by 2030. The directive updates and consolidates previous directives (2004/107/EC and 2008/50/EC) to enhance clarity and effectiveness. This plan is part of the broader European Green Deal and Zero Pollution Action Plan, targeting significant reductions in air, water, and soil pollution by 2050. The revised directive will also ensure early action, with air quality roadmaps that need to be prepared ahead of 2030 if there is a risk that the new standards will not be attained by that date. The air quality standards will be reviewed regularly in line with latest scientific evidence to assess whether they continue to be appropriate.

Directive (EU) 2024/2881 was published in the EU's Official Journal and entered into force on the 10^{th} of December 2024. Member States have until the 10^{th} of December 2026 to transpose the directive into national law. Ireland is required to meet this deadline; however, at the time of writing, a national transposition date has not yet been confirmed.

By 2030, the European Commission will review the air quality standards, and every five years thereafter, in line with latest scientific evidence.

At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 10-1.

10.2.1.2 Air Quality and Traffic Impact Significance Criteria

The TII document Air Quality Assessment of Specified Infrastructure Projects-PE-ENV-01106 (TII, 2025) 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, 2025) and reproduced in Table 10-2. These criteria have been adopted for the Proposed Development to predict the effect 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 10.2. Dust Emission Magnitude for the Site (Source: Air Quality Assessment of Specified Infrastructure Projects- PE-ENV-01106 (TII, 2025))

10.2.2 Construction Phase

10.2.2.1 Construction Dust Impact Assessment

The main air quality impacts that may arise during demolition and construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10}, $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM_{10}, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts (and effects) is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The synoptic meteorological station at Dublin Airport is located approximately 13.9km northwest of the Proposed Development and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the site. This is due to the relatively short distance between the two locations. While Dublin Airport is not within proximity to the coast, its proximity to the Proposed Development site and the absence of significant topographical variation between the two areas suggest that large differences in prevailing weather patterns are unlikely.

A review of Dublin Airport meteorological data indicates that the prevailing wind direction is south-westerly and wind speeds are generally gentle-moderate in nature (see Section 10.3.3.2). Moderate to high windspeeds (above 5m/s (7-10 knots)) are most likely to result in fugitive dust emissions. Approximately 56% of all hourly data features winds of below 5m/s. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2mm. According to a review of daily rainfall data from 1994-2024, it can be determined that dust generation will be reduced approximately 46% of the time. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust.

The 1994-2024 dataset was selected to ensure full calendar years were included in the analysis and to maintain consistency with the wind rose and rainfall assessments. While more recent data is available, it was not used as 2025 is incomplete, noting the timing of this assessment being undertaken in December 2025 and would, therefore, not provide a consistent long-term baseline.

As with any impact, the risk will be determined by the magnitude of the source, the effectiveness of the pathway and the sensitivity of the receptor.

The IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024) provides a framework for the assessment of risk.

Activities on construction sites have been divided into four types:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions is assessed for each activity that is likely to take place. The assessment methodology considers three separate dust impacts (and effects):

- Annoyance due to dust soiling;
- The risk of health impacts due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors with account being taken to the sensitivity of the area that may experience those effects.

The assessment is used to define appropriate mitigation measures to ensure that there will be no significant effect.

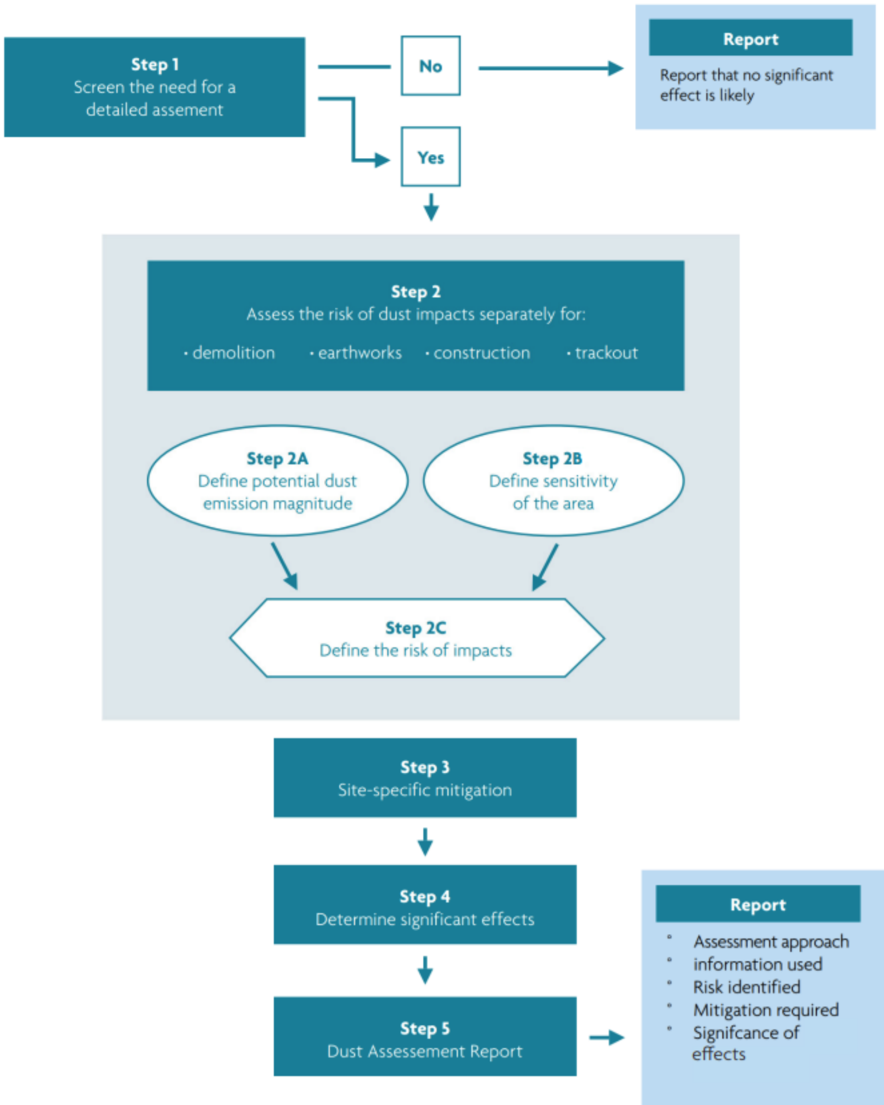

Figure 10.1. Steps to Perform a Dust Assessment (IAQM, 2024)

Step 1- Screening the Need for a Detailed Assessment

Step 1 is to screen the requirement for a more detailed assessment. An assessment will normally be required when there is:

- A human receptor within:
  -250m of the boundary of the site; and/or
  -50m of the route(s) used by the construction vehicles on the public highway, up to 250m from the site entrance(s).
- An ecological receptor within:
  -50m of the boundary of the site; and/or
  -50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

A human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust-soiling, or exposure to particulate matter (PM_{10}) over a period relevant to air quality objectives. An ecological receptor refers to any sensitive habitat that may be affected by dust deposition, including designated sites such as SACs, SPAs, and Sites of Special Scientific Interest (SSSIs).

The screening distances of 50m and 250m are based on IAQM guidance and reflect the typical range within which construction dust may cause impacts, depending on site activity and meteorological conditions. No further assessment is required if there are no receptors within the specified distances.

There are a number of human (residential and commercial) receptors within 250m of the site boundary. The presence of these receptors within the screening zone necessitates a detailed assessment of potential air quality impacts during the construction phase. Table 10.3 identifies the number and type of human sensitive receptors located within 250m of the site boundary.

Receptors	Number of Receptors	Distance to Site Boundary (m)
Residential Properties	465	10-250
Workplaces	22	20-250

Table 10.3. Human Sensitive Receptors within 250m of the Site Boundary

A review of publicly available information indicates that there are no statutory (international or national) ecological receptors within 50m of the site or applicable construction routes. It can therefore be concluded, as there are no statutory receptors within the distance defined by the criteria, that the level of risk to ecological sites is negligible, and impacts will not be significant.

Figures 10.2 - 10.5 show the buffers of 20m, 50m, 100m and 250m from the Proposed Development site boundary, respectively.

Figure 10.2. Map Showing 20m Buffer from Site Boundary

Figure 10.3. Map Showing 50m Buffer from Site Boundary

Figure 10.4. Map Showing 100m Buffer from Site Boundary

Figure 10.5. Map Showing 250m Buffer from the Site Boundary

Step 2- Assess the Risk of Dust Impacts

Step 2 is to assess the risk of dust impacts. This is carried out separately for each of the four activities (demolition, earthworks, construction and trackout). According to the IAQM (2024), the risk of dust arising in sufficient quantities to cause annoyance and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high. A site is allocated a risk category based on two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium and large (Step 2A); and
- The sensitivity of the area to dust impacts (Step 2B), which is defined as low, medium or high sensitivity.

These two factors are combined in Step 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time. Risks are described in terms of there being a low, medium and high risk of dust impacts for each of the four separate potential activities. Where there are low, medium and high risks of an impact, then site-specific mitigation will be required, proportionate to the level of risk.

Step 2A- Define the Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium or Large.

Demolition: Definitions for demolition are as follows:

- Small: Total building volume 12,000m3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months;
- Medium: Total building volume 12,000m3 – 75,000m3, potentially dusty construction material, demolition activities 6-12m above ground level; and
- Large: Total building volume >75,000m3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level.

The total volume of building to be demolished is 538.2m^3 and therefore, the dust emission magnitude for demolition is defined as Small.

Earthworks: Earthworks will primarily involve excavating material, haulage, topping and stockpiling. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium and large based on the definitions from the IAQM guidance:

- Small: Total site area <18,000m2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds >3m in height;
- Medium: Total site area 18,000m2 – 110,000m2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- Large: Total site area >110,000m2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height.

The total site area is approximately 45,600m^2 and therefore, the dust emission magnitude for the proposed earthwork activities is defined as Medium.

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The IAQM example definitions for construction are:

- Small: Total building volume <12,000m3, construction material with low potential for dust release (e.g. metal cladding or timber);
- Medium: Total building volume 12,000m3 – 75,000m3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Large: Total building volume >75,000m3, on site concrete batching, sandblasting.

The total building volume to be constructed is 141,933.5m^3 and therefore, the dust emission magnitude for construction activities is Large.

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. IAQM definitions for trackout are:

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

These numbers are for heavy duty vehicles (HDV) that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

The dust emission magnitude for the proposed trackout activities can be classified as Medium, as there will be no more than 50 outward HDV movements in any one day. This figure was provided by the Construction & Environmental Management Plan (CEMP) prepared by JJ Campbell & Associates Consulting Engineers and reflects the anticipated peak daily volume of HDV movements associated with construction activities.

Table 10.4 provides a summary of the dust emission magnitude for the site.

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Medium
Construction	Large
Trackout	Medium

Table 10.4. Dust Emission Magnitude for the Site

Step 2B- Define the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Sensitivities of People to Dust Soiling Effects

For the sensitivity of people and their property to soiling, the IAQM (2024) recommends that the air quality practitioner uses professional judgment to identify where on the spectrum between high and low the sensitivity of a receptor lies, taking into account the following general principles set out in Table 10-5.

Sensitivity	Features	Indicative Examples
Low	• The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or • There is a transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use for the land.	• Playing fields; • Farmland (unless commercially sensitive horticultural); • Footpaths; • Short-term car parks; and • Places of work
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	• Parks; and • Places of work
High	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at	• Dwellings; • Museums and other culturally important collections; and

	least regularly for extended periods, as part of the normal pattern of the use of the land.	• Medium and long-term car parks and show rooms.

Table 10-5. Sensitivities of People to Dust Soiling Effects (Source: IAQM, 2024)

Sensitivities of People to Health Effects of PM_{10}

For the sensitivity of people to the health effects of PM_{10}, the IAQM (2024) recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period, consistent with the Defra's advice for local air quality management, Defra LAQM Technical Guidance LAWM.TG (2022). Table 10.6 shows the sensitivities of people to the health effects of PM_{10}.

Sensitivity	Features	Indicative Examples
Low	• Locations where human exposure is transient	• Public footpaths; • Playing fields; and • Shopping streets
Medium	• Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	• Office and shop owners
High	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	• Residential properties; • Hospitals; • Schools; and • Residential care homes

Table 10.6. Sensitivities of People to the Health Effects of PM10 (Source: IAQM, 2024)

Tables 10-7 and 10-8 illustrate how the sensitivity of the area may be determined for dust soiling, human health impacts and ecological impacts, respectively. It should be noted that the highest level of sensitivity from each table should be considered, as recommended by the IAQM.

The criteria detailed in Tables 10-7 and 10-8 were used to determine the sensitivity of the area to dust soiling effects and human health impacts for the Proposed Development.

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20m	<50m	<100m	<250m
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 10.7. Sensitivity of Dust Soiling Effects on People and Property

Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from the Source (m)**			
			<20m	**<50m**	**<100m**	**<250m**
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>100	High	Medium	Low	Low
		10-100	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

Low	-	≥1	Low	Low	Low	Low

Table 10-8. Sensitivity of the Area to Human Health Impacts

Step 2C- Define the Risk of Impacts

In accordance with the IAQM Guidelines, the dust emission magnitude (Step 2A) and sensitivity of the area (Step 2B) have been combined and the risk of impacts from demolition, construction, earthworks and trackout have been determined (before mitigation is applied).

Tables 10-9 – 10-12 illustrate how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk with no mitigation measures applied.

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 10.9. Risk of Dust – Demolition

Potential Impact	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 – Earthworks

Potential Impact	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 10.11. Risk of Dust – Construction

	Dust Emission Magnitude

Potential Impact	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Table 10.12. Risk of Dust – Trackout

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with no mitigation applied.

The risk of dust soiling and the effect on human health before mitigation are summarized in Section 10.5.1.

10.2.2.2 Construction Phase Traffic Emissions

Construction phase traffic has the potential to affect air quality. The TII guidance 'Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106' (TII, 2025) 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, its approach may be applied to other developments where a material change in traffic volumes or characteristics is expected:

- 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 20kph or more; or
- A change in road alignment by 5m or greater.

The demolition and construction stage traffic will not change by more than 1,000 AADT or 200 HDV AADT and does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, in accordance with TII guidance, a detailed air assessment of construction stage traffic emissions has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

10.2.3 Operational Phase

Operational phase traffic has the potential to affect local air quality as a result of increased vehicle movements associated with the Proposed Development. The TII scoping criteria detailed in Section 10.2.2.2 were used to determine if any road links will be affected by the Proposed Development and require inclusion in a detailed air quality modelling assessment. The Proposed Development will result in the operational phase traffic increasing by more than 1,000 AADT on 2 no. road links. Therefore, a detailed air quality modelling assessment of operational phase traffic emissions was conducted.

The effect on air quality due to changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The receptor locations are discussed in further detail within Section 10.2.3.2.

The TII guidance (TII, 2025) 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 Minimum (Do Nothing) and Do Something 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) AADT;
- Annual average daily heavy duty vehicles (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 base selection, in accordance with TII Guidance (Air Quality Modelling for National Road Projects, TII, 2024). The Intermediate Case represents a midpoint between two scenarios outlined in the guidance, the Business as Usual case, which assumes current trends in vehicle ownership and fuel types continue, and the Climate Action Plan (CAP) case, which assumes full implementation of national climate targets, including widespread adoption of electric and low-emission vehicles.

It assumes a liner interpolation between these two scenarios and is intended to provide a balanced and realistic projection of future fleet composition.

This approach is considered appropriate for the Proposed Development, as it reflects national policy direction while avoiding overly conservative or optimistic assumptions.

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 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 PM10 emissions associated with brake and tire wear (TII, 2024). 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.

10.2.3.1 Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from NRB Consulting Engineers (2025) for the purposes of this assessment. A full copy of the AADT generated during the operational phase of the Proposed Development can be found in Appendix 10-1. Two different scenarios are presented in Table 10-13 for the operational phase vehicle trip generation data. The 'Do Nothing' and 'Do Something' scenarios for the Opening Year (2028) and Design Year (2043), which is Opening Year plus 15 years, as per TII Guidance. These scenarios have been used to assess the potential traffic-related impacts of the Proposed Development during its operational phase.

The traffic data as detailed in Table 10-13 shows that 2 no. road inks met the TII scoping criteria and were within 100m of receptors, therefore, these links were included in the modelling assessment. Background concentrations have been included as per section 10.3.1 of this chapter based on available EPA background monitoring data (EPA, 2025).

Link Number	Road Name	Opening Year (2028)		Design Year (2043)		Speed (Km/h)	Link Length (m)
		Do Nothing	Do Something	Do Nothing	Do Something		
		AADT	AADT	AADT	AADT		

1	Site Access Road	184 (0%HDV)	1389 (0%HDV)	202 (0%HDV)	1408 (0%HDV)	30	100
17	Temple Rd (N21) east of Rockhill	21475 (2%HDV)	22064 (2%HDV)	23644 (2%HDV)	24920 (2%HDV)	50	120

Table 10.13. Traffic Data Used in Air Modelling Assessment

10.2.3.2 Sensitive Receptors

The effect on air quality as a result of changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (TII, 2025) states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the Proposed Development are to be included in the modelling. The TII criteria state that receptors within 200m of affected road links should be assessed; roads which are greater than 200m from receptors will not affect pollutant concentrations at that receptor. The TII guidance (TII, 2025) defines sensitive receptor 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.

For the purpose of determining local air quality effects, 5 no. receptors were included in this modelling assessment and have been identified. The receptors modelled will represent the worst-case location in the vicinity of the Proposed Development and were chosen based on proximity (within 200m) to the road links affected by the Proposed Development:

Name	Type	ITM Coordinates	
		X	Y
R1	Residential	721889	728950
R2	Residential	721828	728891
R3	Commercial	721223	729429
R4	Commercial	721280	729435
R5	Residential	721269	729372

Table 10.14. Road Traffic Emissions Sensitive Receptors

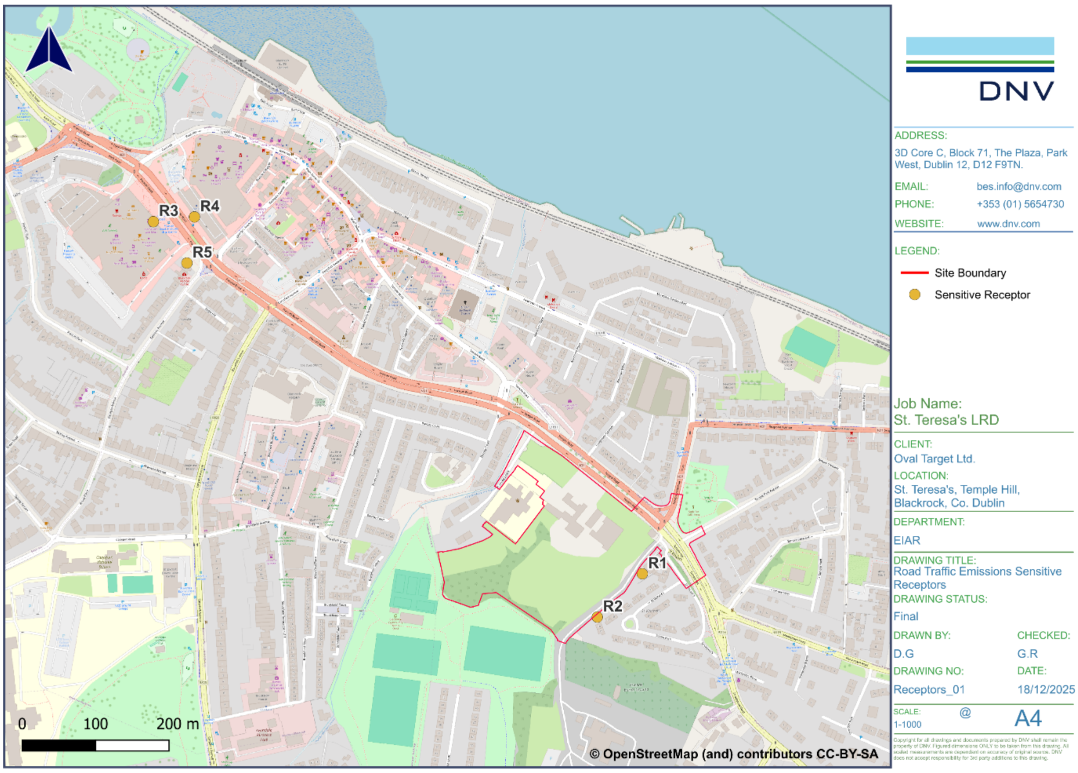

Figure 10.6. Road Traffic Emissions Sensitive Receptors

The modelling results are discussed in Section 10.5 of this chapter.

10.2.3.2.1 Air Quality Impacts on Sensitive Ecology

In addition to assessing the impact to people as a result of air quality, the impact to sensitive ecosystems must also be assessed as per the TII guidelines (TII, 2024; 2025). The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive') requires an Appropriate Assessment to be carried out where there is likely to be a significant impact upon a European protected site. TII requires the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2km of the proposed development site. However, as the potential impact of a scheme is limited to local level, detailed consideration need only be given to roads where there is a significant change to traffic flows, and the designated site lies within 200m of the road centre line. Where these two requirements are fulfilled, the assessment involves a calculation of nitrogen oxides (NOx) and ammonia (NH3) concentrations to determine the N deposition and acid deposition rates using the methodology set out in TII Guidance document PE-ENV-01106 (TII, 2025).

A review of publicly available information indicates that there are no statutory (international or national) ecological receptors within 200m of any of the link roads identified in Table 10-13. Therefore, assessment of potential impacts to ecological receptors has been scoped out and is not considered further in this assessment. As such, a detailed assessment of the potential effects on ecological receptors is not required.

10.3 The Existing Receiving Environment (Baseline)

The site is located at lands off Temple Road, Blackrock, Co. Dublin. The site is approximately 4.56 hectares (Ha) in area. The site is bordered by Temple Road (N31) to the north, the residential area of St. Vincent's Park to the east, the Alzheimer Society of Ireland and further residential buildings to the west, and a greenfield site to the south, beyond which lies Rockfield Park`. The site has vehicular access via St. Louise's Park, which is connected to Temple Road.

10.3.1 Air Quality

Air quality monitoring programmes 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 provides both monitoring data and the results of previous air quality assessments (EPA, 2025).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland by the EPA air quality management and assessment purposes. The main areas defined in each zone are:

- **Zone A:** Dublin Conurbation
- **Zone B:** Cork Conurbation
- **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- **Zone D:** Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

The site is located in Blackrock, Co. Dublin and falls into 'Zone A' of Ireland which is the Dublin Conurbation.

The EPA launched a national air quality forecast in November 2023 to provide greater information to the public regarding expected air quality in Ireland for up to three days- 'Today', 'Tomorrow' and the 'Day after Tomorrow'.

Forecasts include daily Air Quality Index for Health (AQIH), Particulate Matter (PM), nitrogen dioxide (NO2) and ozone (O3). PM, NO2 and O3 are the three main air pollutants impacting human health in Ireland. All pollutants mapped are presented on the AQIH scale (1 – 10). The forecast maps are uploaded twice daily, once in the morning and once in the evening.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality in Ireland, 2024' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2024 (EPA, 2025)

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measures concentrations of NO_2 for the years 2023 and 2024 are presented in Table 10-15 for Zone A monitoring stations.

Station	Objective	Concentration (µg/m^3)		Limit or Threshold Value
		2023	2024	
Amiens St.	Annual Mean NO_2	-	36.4	40 µg/m^3
	Days >200 µg/m^3	-	0	18 days
Ballyfermot	Annual Mean NO_2	13.4	13.1	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Blanchardstown	Annual Mean NO_2	25.4	28.6	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Davitt Road	Annual Mean NO_2	17.3	15.8	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Dublin Airport	Annual Mean NO_2	20.5	17.9	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Dublin Port	Annual Mean NO_2	23.1	23.8	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Dun Laoghaire	Annual Mean NO_2	13.4	10.7	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Lucan	Annual Mean NO_2	20.6	18.6	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Pearse St.	Annual Mean NO_2	38.8	38.2	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Rathmines	Annual Mean NO_2	14.8	12.8	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Ringsend	Annual Mean NO_2	19.2	17.5	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
St. Johns Road	Annual Mean NO_2	32.1	31.1	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Swords	Annual Mean NO_2	10.3	9.5	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Tallaght	Annual Mean NO_2	13.8	12.1	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days
Winetavern St.	Annual Mean NO_2	19.3	15.1	40 µg/m^3
	Days >200 µg/m^3	0	0	18 days

Table 10.15. Concentrations of NO2 at Zone A Monitoring Stations

Based on the data summarised in Table 10-15, existing baseline air quality for the area in which the site is located can be characterised as being of good quality with no exceedances of the Air Quality Regulations limit values of specific pollutants. The results show that current levels of NO_2 are below the annual mean and 1-hour maximum limit values. In the year 2023, annual mean concentrations of NO2 ranged from 10.3 - 38.8 µg/m^3 across all Zone A stations, with no exceedance of the maximum hourly limit (EPA, 2024). In the year 2024, annual mean concentrations of NO_2 ranged from 10.7 - 38.2 µg/m^3 across all Zone D stations, with no exceedance of the maximum hourly limit (EPA, 2025).

The average concentration of NO_2 in 2024 was 20.08 µg/m^3. EPA 2024 background concentrations have been used in combination with correction factors to estimate the current average NO_2 concentrations in the region of the Proposed Development. These factors have been adapted to from both TII (2011) and DEFRA roadside NO_2 projection factors. While developed in UK conditions, DEFRA’s projection factors are commonly used in Irish assessments where localised projection tools are not available. The term ‘projection factor’ is used in DEFRA guidance to describe year-on-year adjustments to NO_2 concentrations based on expected changes in traffic and emissions. Based on these correction factors, the current NO_2 concentration in the region of the Proposed Development is 17.8 µg/m^3.

Measures concentrations of PM_{10} for the years 2023 and 2024 are presented in Table 10-16 for Zone A monitoring stations.

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2023	2024	
Amiens St.	Annual Mean PM_{10}	-	16.0	40 µg/m³
	Days >50 µg/m³	-	2	35 days
Ballyfermot	Annual Mean PM_{10}	11.1	11.5	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Blanchardstown	Annual Mean PM_{10}	13.3	12.8	40 µg/m³
	Days >50 µg/m³	0	1	35 days
Clonskeagh	Annual Mean PM_{10}	10.3	11.4	40 µg/m³
	Days >50 µg/m³	0	2	35 days
Davitt Road	Annual Mean PM_{10}	13.3	16.8	40 µg/m³
	Days >50 µg/m³	0	6	35 days
Dublin Airport	Annual Mean PM_{10}	11.9	12.2	40 µg/m³
	Days >50 µg/m³	0	1	35 days
Dublin Port	Annual Mean PM_{10}	15.4	14.8	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Dun Laoghaire	Annual Mean PM_{10}	11.6	11.8	40 µg/m³
	Days >50 µg/m³	0	1	35 days
Finglas	Annual Mean PM_{10}	12.3	12.4	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Lucan	Annual Mean PM_{10}	12.4	13.0	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Marino	Annual Mean PM_{10}	11.6	12.2	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Pearse St.	Annual Mean PM_{10}	14.4	14.5	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Phoenix Park	Annual Mean PM_{10}	9.1	9.5	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Rathmines	Annual Mean PM_{10}	15.1	13.1	40 µg/m³
	Days >50 µg/m³	1	2	35 days
Ringsend	Annual Mean PM_{10}	13.8	15.5	40 µg/m³
	Days >50 µg/m³	0	3	35 days
St. Anne's Park	Annual Mean PM_{10}	10.9	10.5	40 µg/m³
	Days >50 µg/m³	0	0	35 days
St. Johns Road	Annual Mean PM_{10}	11.9	13.2	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Swords	Annual Mean PM_{10}	9.0	10.2	40 µg/m³
	Days >50 µg/m³	0	0	35 days
Tallaght	Annual Mean PM_{10}	11.5	10.4	40 µg/m³
	Days >50 µg/m³	1	0	35 days
Winetavern St.	Annual Mean PM_{10}	12.9	11.6	40 µg/m³
	Days >50 µg/m³	0	0	35 days

Table 10.16 Concentrations of PM10 at Zone A Monitoring Stations

As is evident from the results shown in Table 10-16, current levels of PM_{10} are below the annual mean limit value. In the year 2023, annual mean concentrations of PM_{10} ranged from 9.0 – 15.4 µg/m³ across all Zone A stations, with no exceedance of short-term limit values (EPA, 2024). In the year 2024, annual mean concentrations of PM_{10} ranged from 9.5 – 16.8 µg/m³ across all Zone A stations, with no exceedance of short-term limit values (EPA, 2025).

For PM_{10} projections, DEFRA does not provide straightforward year-on-year factors like it does for NO_2. In the absence of detailed local projection tools, a general annual reduction is applied to reflect expected improvements in vehicle emissions and air quality trends.

While a 2-4% reduction is commonly used in practice, a 2% reduction has been applied to remain conservative. This approach helps ensure that projected concentrations are not underestimated, which is particularly important when assessing potential impacts on sensitive receptors.

The average concentration of PM_{10} in 2024 was 12.67 µg/m³. A conservative estimate of the background PM_{10} levels for the region of the Proposed Development is therefore 12.42 µg/m³.

Measured concentrations of $PM_{2.5}$ for the years 2023 and 2024 are presented in Table 10-17 for Zone A monitoring stations.

Station	Averaging Period	Year	
		2023	2024
Amiens St.	Annual Mean $PM_{2.5}$ ($\mu g/m^3$)	-	8.1
Ballyfermot		6.9	7.3
Blanchardstown		7.1	7.3
Clonskeagh		6.4	7.2
Davitt Road		7.0	7.8
Dublin Airport		6.2	6.6
Dublin Port		7.8	7.4
Dun Laoghaire		7.4	7.5
Finglas		6.6	7.0
Lucan		6.9	7.3
Marino		7.2	7.6
Pearse St.		7.4	7.9
Phoenix Park		5.6	7.5
Rathmines		7.2	7.6
Ringsend		6.6	7.1
St. Anne's Park		6.5	6.4
St. Johns Road		7.1	7.8
Swords		5.8	6.4
Tallaght		5.9	6.2
Winetavern St.		-	6.4

Table 10.17. Concentrations of PM2.5 at Zone A Monitoring Stations

As evident from the results in Table 10-17, current levels of $PM_{2.5}$ are below the annual mean limit value of 25 $\mu g/m^3$. In the year 2023, annual mean concentrations of $PM_{2.5}$ ranged from 5.6 – 7.8 $\mu g/m^3$ across all Zone A stations (EPA, 2024). In the year 2024, annual mean concentrations of $PM_{2.5}$ ranged from 6.2 – 8.1 $\mu g/m^3$ across all Zone A stations (EPA, 2025).

For PM2.5 projections, DEFRA does not provide straightforward year-on-year factors like it does for NO2. In the absence of detailed local projection tools, a conservative annual reduction of 2% is applied to recent measured or modelled concentrations. This aligns with the approach used for PM10 and ensures consistency across assessments.

The average concentration of $PM_{2.5}$ in 2024 was 7.22 μg/m^3. A conservative estimate of the background PM_{10} levels for the region of the Proposed Development is therefore 7.08 μg/m^3.

10.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9oC and 10oC. Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground; and generally, decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

10.3.3 Microclimate

The synoptic meteorological station at Dublin Airport is located approximately 13.9km northwest of the Proposed Development and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the site.

The weather in the area of the site is generally dominated by the Irish Sea which results in damp, mild weather that is dominated by cool oceanic air masses. The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The expected annual rainfall for the eastern half of the country ranges between 750mm and 1000mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

Based on meteorological data at Dublin Airport over the last 3 years, the mean January temperature is 5.1° C, while the mean July temperature is 15.5° C.

10.3.3.1 Rainfall

Table 10-18 illustrates the monthly and annual rainfall data collected over a 3-year period (2022-2024) at Dublin Airport. The annual rates of precipitation ranged from 670.0mm in 2024 to 1,001.2mm in 2023, with distribution of the highest monthly rainfall values falling mainly in the autumn and winter months. This is broadly within the expected range of the eastern half of the country.

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual
2024	61.3	74.3	115.4	70.2	36.8	30.4	37.7	36.6	59.6	47.8	54.2	45.7	670.0
2023	41.2	16.2	119.0	77.6	35.9	49.4	149.2	119.4	134.0	125.7	65.1	68.5	1001.2
2022	14.4	88.5	45.6	28.1	48.4	43.6	29.6	34.6	127.9	106.8	46.1	74.0	687.6
Long-Term Average	61.8	52.4	51.4	55.0	57.0	64.0	61.0	73.4	63.3	78.4	82.7	72.1	772.5

Table 10.18. Monthly Rainfall Values (mm) for Dublin Airport Weather Station from January 2022 to December 2024 (Source: Met Éireann)

10.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Dublin Airport synoptic weather station over a period of 30 years (1994-2024) suggests that the predominant wind direction blows form the southwest, with windspeeds of between 11-16 knots occurring most frequently.

Figure 10-7 provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Dublin Airport weather station over a period of 30 years (1994-2024). Wind speeds of 7 and 8 knots have the highest frequency, occurring approximately 7.95% of the time.

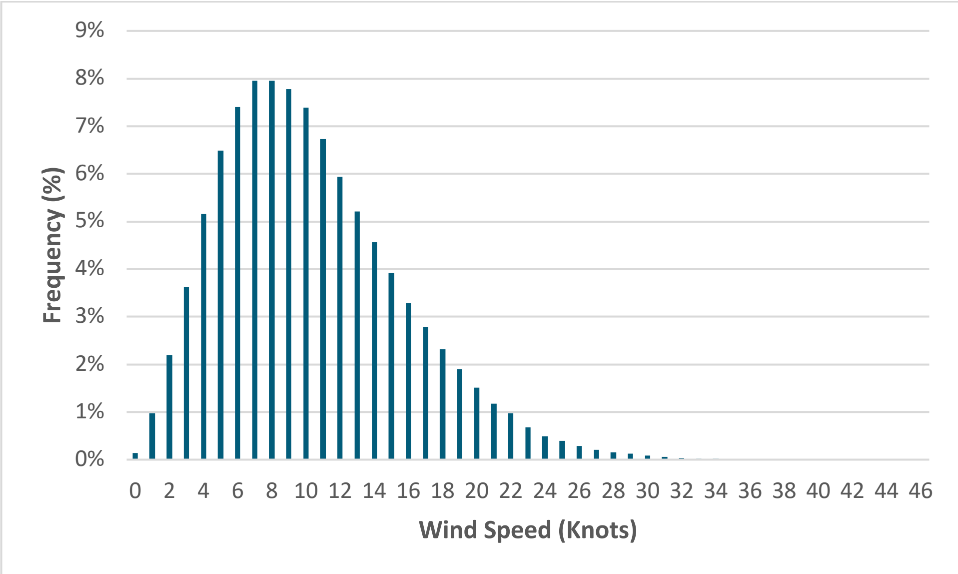

Figure 10.7. Wind Speed Frequency Distribution at Dublin Airport Synoptic Weather Station over a period of 30 Years (1994-2024)(Developed using Met Éireann Hourly Data)

Figure 10-8 provides a wind rose of the predominant wind directions and associated wind speeds at Dublin Airport synoptic weather station. As is visible from Figure 10-8, the prevailing winds are south-westerly, with an annual incidence of 31.62% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 11-16 knots, which is considered a 'Moderate Breeze' in terms of the Beaufort Scale. This wind direction and wind speed occurs in combination approximately 11.16% of the time. The overall most common windspeed is between 7 and 10 knots, occurring in approximately 31.07% of incidences, and wind speeds between 11 and 16 knots, occurring in approximately 29.65% of incidences.

The lowest frequency is for winds blowing from the north, with an annual incidence of approximately 2.94%. The incidence of wind between 1 and 6 knots is approximately 25.85%, with wind speeds of above 17 knots occurring in approximately 13.29% of incidences. The wind rose shown in Figure 10-8 is broadly representative of the prevailing conditions experienced at the site of the Proposed Development.

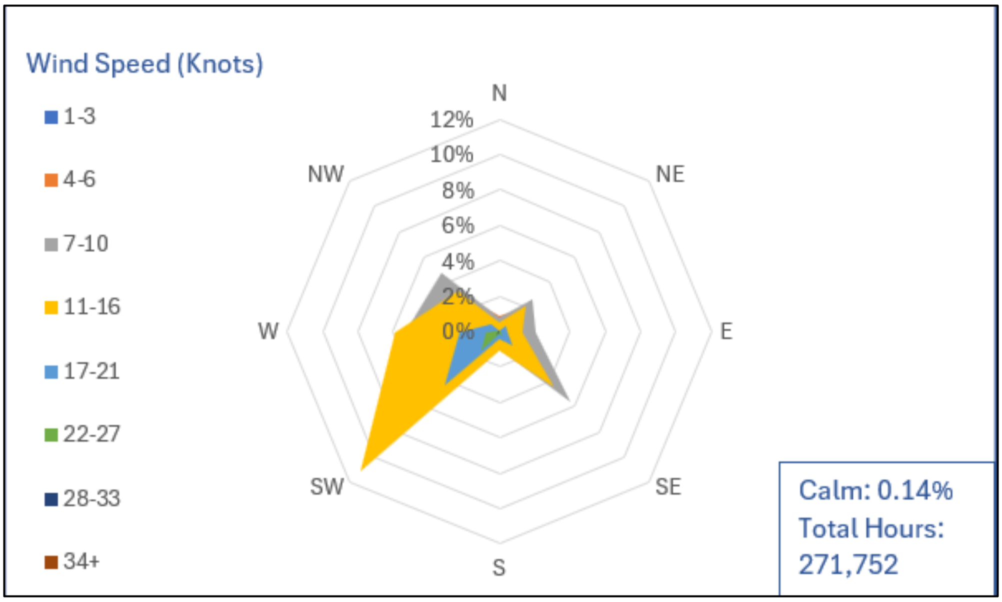

Figure 10.8. 30-year Wind Rose at Dublin Airport Synoptic Weather Station over a period of 30 years (1994-2024) (Developed using Met Éireann Hourly Data)

10.4 Characteristics of the Proposed Development

Chapter 2 of this EIAR includes a detailed description of the Proposed Development.

10.4.1 Aspects Relvant to this Assessment

10.4.1.1 Construction Phase

The aspects of the construction phase relevant to this chapter are as follows:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10}, $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM_{10}, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

10.4.1.2 Operational Phase

The aspects of the operational phase relevant to this chapter are as follows:

- An increase in concentrations of PM_{10}, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles assessing the site.

10.5 Potential Impact of the Proposed Development

10.5.1 Construction Stage

10.5.1.1 Dust

There is potential for construction related air emissions to effect local air quality due to the Proposed Development. The IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' (2024) provides a framework for the assessment of risk, details of which are provided in Section 10.2 of this chapter.

Potential Dust Emission Magnitude (Step 2A)

The potential magnitude of dust emissions from demolition, construction, earthworks and trackout has been assessed, as identified in Table 10-19.

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Medium
Construction	Large
Trackout	Medium

Table 10.19. Dust Emission Magnitude for the Site

Sensitivity of the Area (Step 2B)

Table 10-20 outlines the sensitivity of the area to construction dust based on three factors: dust soiling, human health and ecology. The classification helps in assessing the potential effect of construction activities on air quality and guides mitigation.

Sensitivity Type	Factors	Sensitivity of Area	
		On-Site	Trackout
Dust Soiling	In order to account for a worst-case scenario, the sensitivity of the area has been classified as high for on-site activity (demolition, earthworks, and construction) and trackout.	High	High
Human Health	As per Section 10.3.1, a conservative estimate of the background PM_{10} levels for the region of the Proposed Development is 12.42 µg/m^3. The PM_{10} concentration is less than 24µg/m^3, however, a precautionary approach has been taken due to the presence of human receptors to the east and west of the site. The sensitivity of the area to human health effects is therefore considered medium.	Medium	Medium
Ecology	A review of publicly available information indicates that there are no statutory (international or national) ecological receptors within 50m of the site or applicable construction routes. It can therefore be concluded, as there are no statutory receptors within the distance defined by the criteria, that the sensitivity of ecological sites is low.	Low	Low

Table 10.20 - Sensitivity of the Area

Risk of Dust Impacts (Step 2C)

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. The risk is then used to inform the selection of appropriate mitigation. Table 10-21 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

Potential Impact	Sensitivity	Magnitude			
		Demolition	Earthworks	Construction	Trackout
		Small	Medium	Large	Medium
Dust Soiling	High	Medium Risk	Medium Risk	High Risk	Medium Risk

Human Health	Medium	Low Risk	Medium Risk	Medium Risk	Low Risk
Ecology	Low	Negligible	Low Risk	Low Risk	Low Risk

Table 10.21. Summary of Unmitigated Risks

The dust risk categories for each of the four activities determined in STEP 2C have been used to define the appropriate, site-specific, mitigation measures to be adopted in Section 10.8.1 of this chapter (Step 3 as per the IAQM 'Guidance on the assessment of dust from demolition and construction' (2024) (see Section 10.2 of this chapter)).

For those cases where the risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required. However, additional mitigation measures as defined in Section 10.2 will be applied as part of good practice.

10.5.1.2 Traffic Assessment

There is also the potential for traffic emissions to affect air quality in the short-term over the construction phase, particularly due to the increase in HDVs accessing the site. NRB Consulting Engineers (2025) have confirmed that the projected demolition and construction traffic volumes fall below the thresholds set out in TII guidance. This information was provided directly by NRB Consulting Engineers and reflects project-specific traffic modelling undertaken by NRB Consulting Engineers.

However, as outlined in Section 10.2.2.2, the construction stage traffic has been reviewed against the scoping criteria set out in TII guidance document 'Air Quality Assessment of Specific Infrastructure Projects- PE-ENV-01106 (TII, 2025). None of the affected road links meet the thresholds for inclusion in a detailed local air quality assessment.

Specifically, the projected changes in traffic volumes, HDVs, speeds and road alignment fall below the defined criteria. Therefore, in accordance with TII guidance, a detailed air quality assessment has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

It can be determined that the construction stage traffic will have a ***direct, short-term, negative*** and ***imperceptible*** effect on air quality and human health, which is overall not significant in EIA terms.

10.5.2 Operational Stage

The potential effects of the Proposed Development have been assessed by modelling emissions from the traffic generated as a result of the development using the TII Road Emissions Model (TII, 2025). The traffic data includes the Do Nothing and Do Something scenarios. The effect of NO2, PM10 and PM2.5 emissions for the modelled Opening Year and Design Year was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute effects, to be determined.

The TII guidance PE-ENV-01106 (TII, 2025) 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 effect is determined based on both the absolute and relative effects 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 effect.

10.5.2.1 NO_2

The results of the assessment of the effects of the Proposed Development on NO2 in the Opening Year 2028 and Design Year 2043 are shown in Table 10-22. The annual average concentration is in compliance with the limit value at the worst-case receptors in the years 2028 and 2043. Concentrations of NO2 are at most 49.98% of the annual limit value in 2028 and 44.98% of the annual limit value in 2043. In addition, the TII guidance (TII, 2025) states that the hourly limit value for NO2 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 NO2 concentrations are significantly below 60 µg/m^3. It can be concluded that the short-term NO2 limit value will be complied with at all receptor locations.

The effects of the Proposed Development on annual mean NO2 concentrations can be assessed relative to 'Do Nothing' levels. NO2 concentrations at the receptors assessed will increase as a result of the Proposed Development when compared with the Do-Nothing scenario. There will be at most an increase of 0.19µg/m^3 at receptor R2, which is a 0.475% change when compared with the ambient air quality limit value of 40 µg/m^3.

Where the predicted annual mean concentrations in the Opening Year and Design Year without the proposed scheme are less than 75% of the air quality standard (see Table 10-1) and there is a less than 5% change in concentrations compared with the annual mean ambient air quality standard, then, the impact is considered neutral as per the TII significance criteria (see Table 10-2). Therefore, the effect of the Proposed Development on NO2 concentrations according to the TII guidance (TII, 2025) is neutral.

Receptor	Impact Opening Year (2028)						
	Do Nothing (DN)	% of AQLV	Do Something (DS)	% of AQLV	DS-DN	% of AQLV	Description
R1	17.83	44.58%	18	45%	0.17	0.425%	Neutral
R2	17.83	44.58%	18.02	45.05%	0.19	0.475%	Neutral
R3	19.54	48.85%	19.56	48.9%	0.02	0.05%	Neutral
R4	19.96	49.9%	19.99	49.98%	0.03	0.075%	Neutral
R5	18.97	47.43%	18.98	47.45%	0.01	0.025%	Neutral
Impact Design Year (2043)							
R1	17.8	44.5%	17.82	44.55%	0.02	0.05%	Neutral
R2	17.8	44.5%	17.82	44.55%	0.02	0.05%	Neutral
R3	17.95	44.88%	17.95	44.88%	0	0%	Neutral
R4	17.98	44.95%	17.99	44.98%	0.01	0.025%	Neutral
R5	17.9	44.75%	17.9	44.75%	0	0%	Neutral

Table 10.22. Predicted Annual Mean NO2 Concentrations (µg/m^3)

10.5.2.2 PM_{10}

In relation to changes in PM10 concentrations as a result of the Proposed Development, the results of the assessment can be seen in Table 10-23 for the Opening Year 2028 and Design Year 2043. The annual average concentration is in compliance with the limit value at the worst-case receptors in the year 2028 and 2043. Concentrations of PM10 are at most 41.25% of the annual limit value in 2028 and 40.65% of the annual limit value in 2043. In addition, the Proposed Development will not result in any exceedances of the daily PM10 limit value of 50 µg/m^3. The effects of the Proposed Development on annual mean PM10 concentrations can be assessed relative to 'Do Nothing' levels. PM10 concentrations at the receptors assessed will increase as a result of the Proposed Development when compared with the Do-Nothing scenario.

There will be at most an increase of 0.31µg/m^3 at receptor R2, which is a 0.775% change when compared with the ambient air quality limit value of 40 µg/m^3. As with NO2, where the predicted annual mean concentrations in the Opening Year without the proposed scheme are less than 75% of the air quality standard (see Table 10-1) and there is a less than 5% change in concentrations compared with the annual mean ambient air quality standard, then, the impact is considered neutral as per the TII significance criteria (see Table 10-2). Therefore, the effect of the Proposed Development on PM10 concentrations according to the TII guidance (TII, 2025) is neutral.

Receptor	Impact Opening Year (2028)						
	Do Nothing (DN)	% of AQLV	Do Something (DS)	% of AQLV	DS-DN	% of AQLV	Description

R1	12.46	31.15%	12.75	31.88%	0.29	0.725%	Neutral
R2	12.47	31.18%	12.78	31.95%	0.31	0.775%	Neutral
R3	15.67	39.18%	15.7	39.25%	0.03	0.075%	Neutral
R4	16.46	41.15%	16.5	41.25%	0.04	0.1%	Neutral
R5	14.59	36.48%	14.62	36.55%	0.03	0.075%	Neutral
Impact Design Year (2043)							
R1	12.46	31.15%	12.72	31.8%	0.26	0.65%	Neutral
R2	12.47	31.18%	12.74	31.85%	0.27	0.675%	Neutral
R3	15.45	38.63%	15.51	38.78%	0.06	0.15%	Neutral
R4	16.19	40.48%	16.26	40.65%	0.07	0.175%	Neutral
R5	14.45	36.13%	14.49	36,23%	0.04	0.1%	Neutral

Table 10.23. Predicted Annual Mean PM10 Concentrations (µg/m3)

10.5.2.3 PM2.5

In relation to changes in PM2.5 concentrations as a result of the Proposed Development, the results of the assessment can be seen in Table 8-24 for the modelled Opening Year 2028 and Design Year 2043. The annual average concentration is in compliance with the limit value at the worst-case receptors in the year 2028 and 2043. Concentrations of PM2.5 are at most 36.96% of the annual limit value in 2028 and 36.64% of the annual limit value in 2043. The effect of the Proposed Development on annual mean PM2.5 concentrations can be assessed relative to 'Do Nothing' levels. PM2.5 concentrations at the receptors assessed will increase as a result of the Proposed Development when compared with the Do-Nothing scenario.

There will be at most an increase of 0.16 µg/m^3 at receptors R2, which is a 0.64% change when compared with the ambient air quality limit value of 25 µg/m^3. As with NO2, where the predicted annual mean concentrations in the Opening Year without the proposed scheme are less than 75% of the air quality standard (see Table 10-1) and there is a less than 5% change in concentrations compared with the annual mean ambient air quality standard, then, the impact is considered neutral as per the TII significance criteria (see Table 10-2). Therefore, the effect of the Proposed Development on PM2.5 concentrations according to the TII guidance (TII, 2025) is neutral.

Receptor	Impact Opening Year (2028)						
	Do Nothing (DN)	% of AQLV	Do Something (DS)	% of AQLV	DS-DN	% of AQLV	Description
R1	7.1	28.4%	7.25	29%	0.15	0.6%	Neutral
R2	7.11	28.44%	7.27	29.08%	0.16	0.64%	Neutral
R3	8.8	35.2%	8.82	35.28%	0.02	0.08%	Neutral
R4	9.22	36.88%	9.24	36.96%	0.02	0.08%	Neutral
R5	8.23	32.92%	8.25	33%	0.02	0.08%	Neutral
Impact Design Year (2043)							
R1	7.1	28.4%	7.24	28.96%	0.14	0.56%	Neutral
R2	7.1	28.4%	7.25	29%	0.15	0.6%	Neutral
R3	8.72	34.88%	8.76	35.04%	0.04	0.16%	Neutral
R4	9.12	36.48%	9.16	36.64%	0.04	0.16%	Neutral
R5	8.18	32.72%	8.2	32.8%	0.02	0.08%	Neutral

Table 10.24. Predicted Annual Mean PM2.5 Concentrations (µg/m3)

10.5.2.4 Conclusion

Overall, the TII significance criteria have identified neutral impacts due to increases in NO_2, PM_{10} and $PM_{2.5}$ annual mean concentrations which are less than 5% of the annual mean ambient air quality standards (and the annual mean concentrations are less than 75% of the air quality standard). This equates to a potential effect of the Proposed Development on ambient air quality, and human health, in the operational stage according to the EPA guidelines (EPA, 2022) which is considered direct, long-term, negative, which is overall not significant in EIA terms.

10.5.2.5 Co$_2$

There is the potential for increased traffic volumes to affect climate, therefore, traffic related CO_2 emissions have also been calculated through the use of the TII REM tool. The output is provided in terms of CO_2eq for the Opening Year (2028) and Design Year (2043). Both the 'Do Nothing' and 'Do Something' scenarios are quantified in order to determine the degree of change in emissions as a result of the Proposed Development.

The predicted concentrations of CO_2 for the Opening Year (2028) and Design Year (2043) are detailed in Table 10-25.

Year	Scenario	CO_2eq (tonnes/annum)
2028	Do Nothing	117.45
	Do Something	126.74
2043	Do Nothing	76.8
	Do Something	84.42
Increment in 2028		9.29
Increment in 2043		7.62

Table 10.25. Climate Traffic Assessment

Further discussion on the effect of the increased traffic volumes on Climate is discussed in Chapter 11 'Climate'.

10.6 Potential Cumulative Impacts

The EC 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' defines cumulative impacts as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Impacts which are caused by the interaction of impacts, or by associated or off-site projects, are classed as indirect impacts. Cumulative impacts are often indirect, arising from the accumulation of different effects that are individually minor.

Cumulative air quality effects have the potential to arise locally when construction activities associated with the Proposed Development occur simultaneously with other developments in the area. A review of other off-site developments was completed as part of this assessment. Chapter 2 of this EIAR details the existing, proposed, and granted planning permissions on record in the area, and this review has informed the consideration of cumulative impacts. The cumulative assessment presented in this chapter is informed by the list of existing, permitted, and proposed developments outlined in Chapter 2 of this EIAR, which should be referred to for full details.

10.7 Do Nothing Scenario

If the Proposed Development were not to proceed, 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). Under the Do-Nothing Scenario, construction works associated with the Proposed Development will not take place. Effects from increased traffic volumes and associated emissions from the Proposed Development will also not occur.

10.8 Mitigation Measures

10.8.1 Construction Stage

To minimise potential air quality impacts during construction, a suite of best practice mitigation measures will be implemented at the Proposed Development site. These measures are informed by guidance from the IAQM (2024) and are designed to effectively manage dust and emissions. The following measures will be adopted as appropriate to the scale and nature of the works.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of the person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager;
- Display the head or regional office contact information; and
- Develop and implement a Dust Management Plan (DMP), the final dust management plan will form part of the overall construction management plan which will formally be prepared and submitted to Dun-Laoghaire Rathdown County Council (DLRCC) post grant of planning permission.

Site Management

- Record all dust and air quality complaints, identify causes(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.

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 surface such as street furniture, cars and windowsills within 100m of the site boundary, with cleaning to be provided if necessary;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to DLRCC when asked; and
- 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.

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud'
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles' engineers are switched off when stationary to prevent idling;
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and
- A speed restriction of 20km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.

Operations

- Only use cutting, grinding or sawing equipment or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;

- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes, conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- 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.

Waste Management

- No bonfires and burning of waste materials.

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);
- Ensure effective water suppression is used during demolition operations. Hand held 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;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives; and
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) where possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless that is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- 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; and
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

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;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);

- 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; and
- Access gates are to be located at least 10m from receptors where possible.

These measures will be monitored and reviewed throughout the construction phase to ensure their effectiveness and compliance with relevant standards.

10.8.2 Operational Stage

It has been determined that the operational phase air quality effect is imperceptible and, therefore, no site-specific mitigation measures are proposed.

10.9 Residual Impacts

The IAQM recommends that significance is only assigned to an effect after considering the construction activity mitigation. The risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3 (see Section 8.6.1 of this chapter). The final step is to determine whether there are significant effects arising from the construction phase of the Proposed Development. With the proposed mitigation measures in place, the residual effects from construction dust are predicted to be not significant.

The traffic generated by the Proposed Development has been assessed for its effect on air quality and it has been determined to have an overall not significant effect in terms of local air quality.

Therefore, it is concluded that the Proposed Development will not give rise to any significant adverse residual effects in terms of air quality. The site is considered suitable for the Proposed Development from an air quality perspective.

10.10 Monitoring

10.10.1.1 Construction Stage

The monitoring of construction dust during the construction phase of the Proposed Development will be undertaken to ensure that effects are not experienced beyond the Proposed Development site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the site boundary for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the gauges should be removed from the site; the dust deposits in each gauge will then be determined gravimetrically and expressed as a dust deposition rate in $mg/m^2/day$ in accordance with the relevant standard.

10.10.1.2 Operational Stage

Due to the negligible effect on air quality from the operational phase of the Proposed Development, no specific monitoring is recommended except for monitoring via the Bergerhoff Method.

10.11 Reinstatement

No reinstatement measures pertaining to air quality are required.

10.12 Interactions

Interactions between Air Quality and other aspects of this EIA are considered in this section of the chapter. This section has been informed by, and should be read in conjunction with, other relevant chapters including Population and Human Health, Biodiversity, Land and Soils, Climate, and Traffic and Transport, to ensure a consistent and comprehensive assessment of potential interactions.

10.12.1 Population and Human Health

The Proposed Development has the potential to generate dust during demolition and construction and emissions from traffic during the operational phase, which could affect nearby sensitive receptors if not properly managed.

However, the mitigation measures employed at the Proposed Development during demolition and construction, as outlined in Section 10.8.1, will ensure that all effects are compliant with ambient air quality standards, and that exposure levels remain below thresholds known to impact human health.

Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant effect, therefore air quality effects from the Proposed Development are not expected to have a significant effect on population and human health. This chapter should be read in conjunction with Chapter 5 (Population and Human Health), to provide a comprehensive understanding of potential health-related interactions.

10.12.2 Biodiversity

Interactions between air quality and biodiversity have been considered in conjunction with Chapter 6 (Biodiversity). During the demolition and construction phase, dust emissions could potentially affect nearby habitats and species. However, the mitigation measures outlined in this chapter will minimise dust deposition and no significant impacts on designated sites or sensitive ecological receptors are anticipated. No significant interactions are expected during the operational phase.

10.12.3 Land and Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential to generate dust, which may interact with land and soils. This interaction has been considered alongside Chapter 7 (Land, Soils, Geology, Hydrogeology and Utilities). With the application of the appropriate dust control measures, no significant effects are predicted during the construction phase. There are no potentially significant interactions identified during the operational phase between air quality and land and soils.

10.12.4 Climate

Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the demolition/construction and operational phases of the Proposed Development. These activities generate pollutants that contribute to both local air quality impacts and global climate change.

During the construction phase, emissions may arise from machinery, equipment, and vehicle movements, contributing to both air pollutants and greenhouse gases. During the operational phase, traffic-related emissions associated with the Proposed Development are the primary source of ongoing contributions to climate-related impacts.

While air quality does not directly influence climate, the sources of emissions that affect both are closely linked. As such, the assessment of air quality has been undertaken in parallel with the climate assessment presented in Chapter 11 (Climate) to ensure consistency in the evaluation of emissions and their potential impacts.

Based on the nature and scale of the Proposed Development, and the mitigation measures in place, no significant effects on climate are anticipated during either the construction or operational phases.

10.12.5 Traffic

There can be a significant interaction between air quality and traffic. This is due to traffic-related pollutants that may arise during both the construction and operational phases. In the current assessment, traffic derived pollutants which may affect air quality have been deemed not significant. Therefore, the effect of the interaction between air quality and traffic is not significant for both the construction and operational phases of the Proposed Development.

10.13 Difficulties Encountered

No difficulties were encountered during the preparation of this chapter.

10.14 References

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