CHAPTER FOURTEEN AIR QUALITY

14.1 INTRODUCTION

This chapter identifies, describes and assesses the likely air quality impacts of the proposed development (as described in chapter 2 of this EIAR).

The proposed application site (Phase II) is part of a phased development proposal for a significant city centre, regeneration area or Masterplan Site (MS). This MS is divided into four different phases of delivery as detailed in Section 1.6.3 in Chapter 1.0 Introduction. The overall MS layout which illustrates the indicative layout of the subject site and adjoining lands in the ownership of the applicant is displayed in Chapter 1.0, Figure 1.4 and full details of the proposed development phases are provided in Chapter 2.0, Section 2.2.4.'In addition to an in-depth assessment of the Proposed Development, this assessment takes a holistic approach and examines the wider MS area, taking into account the proposed future phases of development based on the available information.

This Chapter should be read in conjunction with Chapter 18 Material Assets Traffic and Transport and the Traffic and Transportation Assessment submitted with the planning application.

14.2 ASSESSMENT METHODOLOGY

14.2.1 Relevant Legislation & Guidance

The principal guidance and best practice documents adhered to in carrying out the assessment of potential impacts on air quality are listed 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 adhered to 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).

14.2.2 Criteria for Rating of Impacts

14.2.2.1 Ambient Air Quality Standards

To reduce the risk to health from poor air quality, national and European statutory bodies 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 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 sets out 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 0-1 outlines the limit values pre-2030 and post-2030 for the specified pollutants.

Table 0-1 Ambient Air Quality Limit Values

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

14.2.2.2 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 0-2), the IT4 targets by 2030 and the final targets by 2040 (Table 0-2). 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."*

Table 0-2 WHO Air Quality Guidelines 2021

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	24-hour limit for protection of human health	-	-	25 µg/m^3
	Annual limit for protection of human health	20 µg/m^3	-	10 µg/m^3
PM (as PM_{10})	24-hour limit for protection of human health	75 µg/m^3	50 µg/m^3	45 µg/m^3
	Annual limit for protection of human health	30 µg/m^3	20 µg/m^3	15 µg/m^3
PM (as $PM_{2.5}$)	24-hour limit for protection of human health	37.5 µg/m^3	25 µg/m^3	15 µg/m^3
	Annual limit for protection of human health	15 µg/m^3	10 µg/m^3	5 µg/m^3

The applicable air quality limit values for the purposes of this assessment are those set out in Table 0-1. The limit values stipulated in Table 2 of Annex I of Directive (EU) 2024/2881 are applicable for the construction phase and Opening Year 2026 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 2041 for the proposed development (15 years post-opening year).

14.2.2.3 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 0-1 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/m^2/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.

14.2.2.4 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 0-3 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.

Table 0-3 Air Quality & Traffic Significance Criteria

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

Source: Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022)

As per Table 0-3 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 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).

14.2.3 Construction Phase

14.2.3.1 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 0-4, 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.

Table 0-4 IAQM Criteria to Determine Dust Emissions Magnitude

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		
• 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

Once the dust emission magnitude has 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 0-5.

Table 0-5 IAQM Criteria to Determine Risk of Dust Impacts

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

14.2.3.2 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.

ARUP have prepared a Traffic and Transport Assessment (TTA) for the proposed development enclosed separately and AtkinsRealis have prepared Chapter 18 Material Assets – Traffic and Transport of this EIAR. As per the TTA and Chapter 18, it has been determined by Atkins Realis 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 to human or ecological receptors.

14.2.4 Operational Phase

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 13.4.2.4 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. The proposed development will not result in the operational phase traffic increasing by more than 1,000 AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the proposed development satisfy the screening criteria (Section 13.4.3.2). A quantitative assessment of the impact of traffic emissions on ambient air quality is not necessary as there is no potential for significant impacts to local air quality.

Potential emissions from standby diesel generators have also been considered. These generators are intended for emergency use only and all have a thermal input capacity of less than1MW_{th}. Due to their small capacity and infrequent use, they are therefore considered minor emission sources and have been scoped out of further assessment.

14.2.5 Limitations and Assumptions

The assessment is subject to the following limitations and assumptions:

- Where details were unavailable for construction methods and programme, the assessment was completed using professional judgment on the likely scale of activities, the sensitivity of the environment, and experience of working on similar schemes.

However, the assumptions made for the purposes of the assessment are robust and have not impacted the conclusion of the assessment.

14.3 EXISTING RECEIVING ENVIRONMENT

The receiving environment in terms of air quality is the same for the proposed development and overall masterplan development. Air quality is unlikely to differ across the sites. Therefore, the following sections detail the existing air quality environment and do not differentiate between the overall cumulative masterplan development or the individual proposed development.

14.3.1 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 Shannon Airport meteorological station, which is located approximately 18 km northwest of the site. Shannon Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 0.1). 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 4.6 m/s (Met Éireann, 2025).

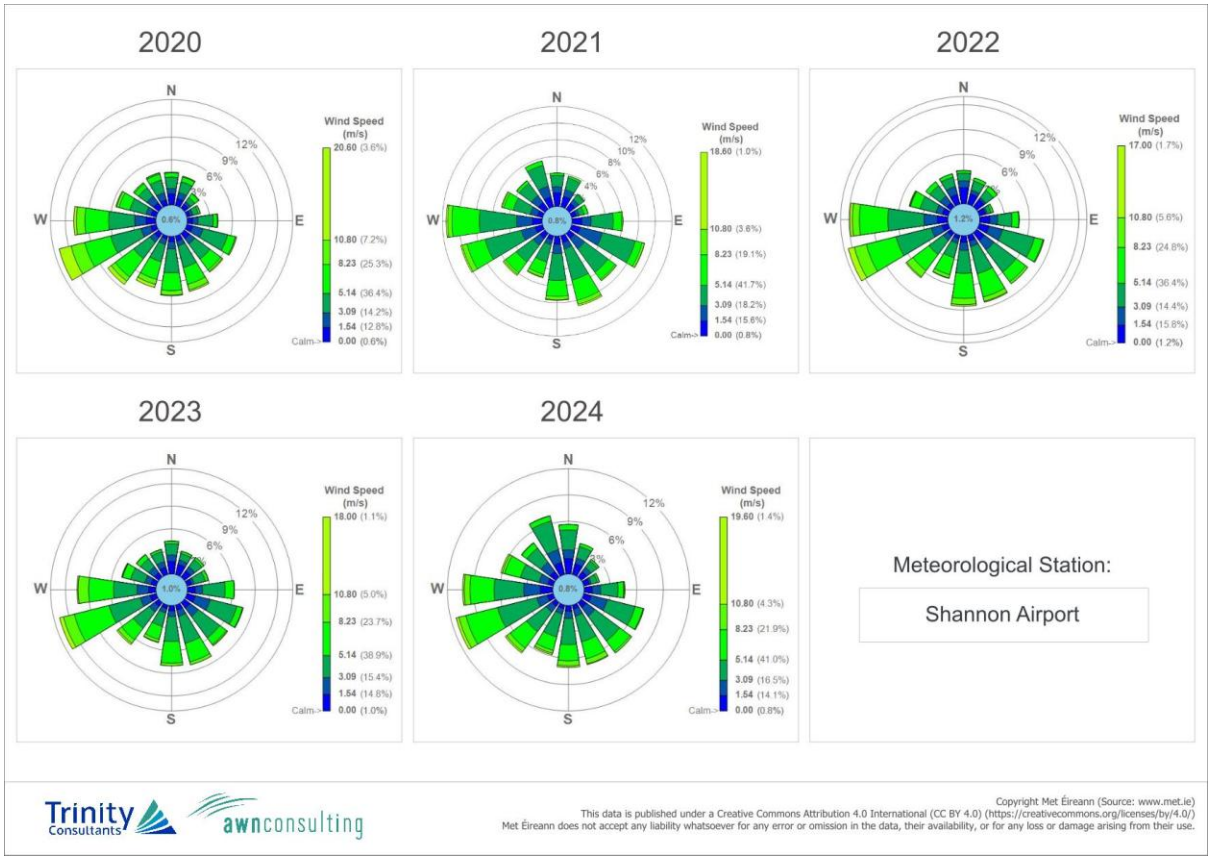

Figure 0.1 Wind Roses for Shannon Airport Meteorological Station

14.3.2 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 2023*' (EPA, 2024). 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, 2024). 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, 2024). 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.). Representative EPA monitoring stations have been used to determine an estimate of the background air quality in the region of the proposed development.

14.3.2.1 NO_2

Long-term NO_2 monitoring was carried out at the representative Zone C suburban background location of Dundalk, Kilkenny and Portlaoise for the period 2019 – 2023 (Table 0-6) (EPA, 2024). Long-term average concentrations are significantly below the annual average limit of 40 µg/m^3. Average results range from 4 – 12 µg/m^3. The overall annual average concentration for this 5-year period is 8 µg/m^3. Additionally, there was at most 1 exceedance of the hourly limit value of 200 µg/m^3. 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.

Table 0-6 Trends In Zone C Air Quality - Nitrogen Dioxide (NO_2)

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Dundalk	Annual Mean NO_2 (µg/m^3)	12	10	11	10	9
	1-hr Mean > 200 µg/m^3 (days)	-	1	0	1	1
Kilkenny Seville Lodge	Annual Mean NO_2 (µg/m^3)	5	4	4	5	4
	1-hr Mean > 200 µg/m^3 (days)	-	0	0	0	0
Portlaoise	Annual Mean NO_2 (µg/m^3)	11	8	8	9	8
	1-hr Mean > 200 µg/m^3 (days)	-	0	0	0	0

14.3.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at a number of representative Zone C locations from 2019 – 2023; Athlone, Carlow Town, Dundalk, Ennis, Galway Rahoon, Kilkenny Seville Lodge, Portlaoise and Tralee. Annual average PM_{10} concentrations across the sites ranged from 10 – 28 µg/m^3 over the 2019 – 2023 period (Table 0-7). The overall annual average concentration for this 5-year period is 15 µg/m^3. There were at most 21 exceedances of the daily limit of 50 µg/m^3 in 2022 (at Ennis). However, 35 exceedances are permitted per year (EPA, 2024). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 15 µg/m^3.

Table 0-7 Trends In Zone C Air Quality - PM_{10}

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Athlone	Annual Mean PM_{10} (µg/m^3)	17	16	12	12	12
	24-hr Mean > 50 µg/m^3 (days)	-	3	2	3	-
Carlow Town	Annual Mean PM_{10} (µg/m^3)	11	11	10	11	10
	24-hr Mean > 50 µg/m^3 (days)	-	1	0	0	-
Dundalk	Annual Mean PM_{10} (µg/m^3)	14	13	12	12	13
	24-hr Mean > 50 µg/m^3 (days)	2	2	0	2	-
Ennis	Annual Mean PM_{10} (µg/m^3)	18	20	19	20	16
	24-hr Mean > 50 µg/m^3 (days)	12	19	17	21	-
Galway Rahoon	Annual Mean PM_{10} (µg/m^3)	13	13	11	13	13
	24-hr Mean > 50 µg/m^3 (days)	0	1	1	0	-
Kilkenny Seville Lodge	Annual Mean PM_{10} (µg/m^3)	18	18	17	18	14
	24-hr Mean > 50 µg/m^3 (days)	7	1	2	2	-
Portlaoise	Annual Mean PM_{10} (µg/m^3)	15	12	11	12	11
	24-hr Mean > 50 µg/m^3 (days)	0	0	1	0	-
Tralee	Annual Mean PM_{10} (µg/m^3)	28	16	17	18	15
	24-hr Mean > 50 µg/m^3 (days)	2	7	11	14	-

14.3.2.3 $PM_{2.5}$

Average $PM_{2.5}$ levels in Athlone, Carlow Town, Ennis, Greystones, Naas, Portlaoise, Tralee and Bray over the period 2019 - 2023 ranged from 5 – 23 µg/m^3 (EPA, 2024). The overall annual average concentration for this 5-year period is 9 µg/m^3 (Table 0-8). Based on this information, an estimate of the background $PM_{2.5}$ concentration in the region of the proposed development is 9 µg/m^3.

Table 0-8 Trends In Zone C Air Quality - $PM_{2.5}$

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Athlone	Annual Mean $PM_{2.5}$ (µg/m^3)	14	12	9	9	8
Carlow Town	Annual Mean $PM_{2.5}$ (µg/m^3)	8	7	7	7	6
Ennis	Annual Mean $PM_{2.5}$ (µg/m^3)	14	14	15	16	12
Greystones	Annual Mean $PM_{2.5}$ (µg/m^3)	-	-	6	7	6
Naas	Annual Mean $PM_{2.5}$ (µg/m^3)	-	-	7	8	7
Portlaoise	Annual Mean $PM_{2.5}$ (µg/m^3)	-	8	8	8	7
Tralee	Annual Mean $PM_{2.5}$ (µg/m^3)	23	12	13	13	10
Bray	Annual Mean $PM_{2.5}$ (µg/m^3)	7	5	6	6	6

14.3.2.4 Summary

Based on the above information the air quality in the Limerick area is generally good, with concentrations of the key pollutants generally well below the current 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 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 has 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 predicts that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2024).

14.3.3 Sensitivity of the Receiving Environment

14.3.3.1 Construction Phase

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first 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. Table 0-9 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).

Table 0-9 Criteria for Determining the Sensitivity of the Area

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

Sensitivity of the Area to Dust Related Ecological Impacts		
Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	**High**	Medium
Medium	Medium	Low
Low	Low	Low

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 0.2). 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. It is also likely that due to the phasing and timeline of the construction works the Salesians and Stonetown Terrace residential property could be occupied during the construction phase. Based on these receptor numbers and using the IAQM criteria in Table 0-9, 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 15 µg/m^3. There are 10-100 high sensitivity receptors within 20 m of the proposed development boundary (Figure 0.2). It is also likely that due to the phasing and timeline of the construction works the Salesians and Stonetown Terrace residential property could be occupied during the construction phase .Based on the IAQM criteria outlined in Table 0-9 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 from 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.

Designated sites within 250m of the proposed development include the Fergus Estuary-North Shore pNHA, Inner Shannon Estuary-South Shore pNHA, Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA (Figure 0.2). High sensitivity ecological receptors are sites with European or National designation with particularly dust sensitive species present. The Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA are Natura 2000 site (European designation) and are therefore of high sensitivity. The same sensitivity has been used for the two Natura 2000 sites due to their overlapping areas. Based on the IAQM criteria outlined in Table 13.9, the worst-case sensitivity of the area to dust-related ecological impacts is considered high.

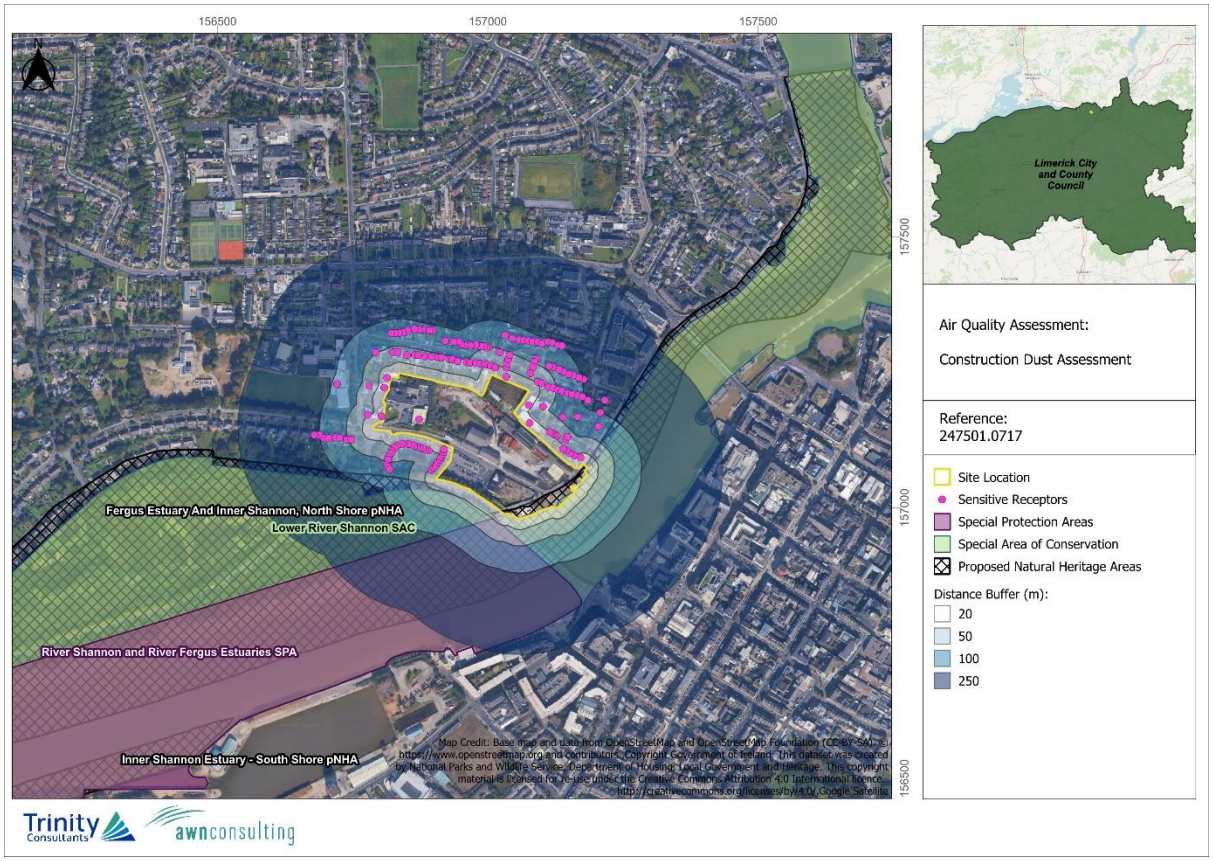

Figure 0.2 Sensitive Receptors within 250m of site

14.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will provide a mixed-use development including residential units, student accommodation, commercial spaces and a creche; public realm works; mobility hub and all associated

site development works. Refer to Chapter 2 of this EIAR and the statutory notices for a full description of the proposed development.

During the construction phase construction dust emissions have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, demolition of existing structures, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of nitrogen dioxide (NO_2) and particulate matter (as PM_{10} and $PM_{2.5}$). Operational phase impacts will be long-term in duration.

14.5 LIKELIHOOD OF SIGNIFICANT EFFECTS

14.5.1 Construction Phase

14.5.1.1 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 Shannon Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 14.3.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Shannon Airport meteorological station indicates that on average 223 days per year have rainfall over 0.2 mm (Met Éireann, 2025). Therefore, it can be determined that 61% of the time dust generation will be reduced due to natural meteorological conditions.

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 14.3.3). 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).

14.5.1.2 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 0-4.

- Demolition: The dust emission magnitude for the demolition activities can be categorised as medium due to the volume being within the medium category range of 12,000 m^3 - 75,000 m^3

of buildings to be demolished. All demolition works will be carried out prior to commencement of construction works.

- Earthworks: The dust emission magnitude for the proposed earthwork activities can be classified as medium as the total site area is between 18,000 m^2 - 110,000 m^2. The impact of rock breaking and crushing has also been considered in this category.
- Construction: The dust emission magnitude for the proposed construction activities can be classified as large as a worst-case as the total volume of buildings to be constructed will be greater than 75,000 m^3.
- Trackout: The dust emission magnitude for the proposed trackout can be classified as large, as HGV movement during worst-case peak periods of construction work are estimated to be 20 HGVs per hour arriving and leaving. Hence, there will be greater than 50 outward HGV movements per day during the peak construction phase of the proposed development.

14.5.1.3 Determining the Risk of Dust Impacts

Once the dust emission magnitude has 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 and dust-related human health effects (Section 14.3.3). The level of risk associated with each activity is determined using the criteria in Table 0-5. The overall risk of dust impacts from the construction works is shown in Table 0-10 for each category.

- Demolition: As the overall sensitivity of the area to dust soiling is high, when combined with a medium dust emission magnitude, this produces an overall medium risk of dust soiling impacts (as per the criteria in Table 0-5). As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects (as per the criteria in Table 0-5). As the overall sensitivity of the area to dust-related ecological effects is high, this results in a medium risk of dust-related ecological effects (as per the criteria in Table 0-5).
- Earthworks: As the overall sensitivity of the area to dust soiling is high, when combined with a large dust emission magnitude, this produces an overall high risk of dust soiling impacts (as per the criteria in Table 0-5). As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects. As the overall sensitivity of the area to dust-related ecological effects is high, this results in a medium risk of dust-related ecological effects (as per the criteria in Table 0-5).
- Construction: Combining the large dust emissions magnitude for the construction activities with the high sensitivity to dust soiling results in a high risk of dust soiling impacts using the criteria in Table 0-5. There is an overall low risk of dust-related human health impacts as a result of the proposed construction activities. There is an overall high risk of dust-related ecological impacts as a result of the proposed construction activities.
- Trackout: Combining the large dust emission magnitude for the trackout activities with the high sensitivity to dust soiling results in a high risk of dust soiling impacts using the criteria in Table 0-5. There is an overall low risk of dust-related human health impacts as a result of the proposed trackout activities. There is an overall high risk of dust-related ecological impacts as a result of the proposed trackout activities.

There is at most a high risk of dust soiling impacts , a low risk of dust-related human health impacts and a high risk of dust-related ecological impacts associated with the proposed works. 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. In the absence of mitigation, dust impacts are predicted to be ***direct, short-term, negative*** and ***slight***, which is an overall ***not significant*** impact in EIA terms.

Table 0-10 Risk of Dust Impacts used to Define Site-Specific Mitigation

Receptor	Receptor Sensitivity	Dust Emission Magnitude	Risk of Dust-Related Impacts
Demolition			
Dust Soiling	High	Medium	Medium Risk
Human Health	Low		Low Risk
Ecology	High		Medium Risk
Earthworks			
Dust Soiling	High	Medium	Medium Risk
Human Health	Low		Low Risk
Ecology	High		Medium Risk
Construction			
Dust Soiling	High	Large	High Risk
Human Health	Low		Low Risk
Ecology	High		High Risk
Trackout			
Dust Soiling	High	Large	High Risk
Human Health	Low		Low Risk
Ecology	High		High Risk

14.5.1.4 Construction Phase 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 Section14.2.3.2.

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

14.5.2 Operational Phase

There is the potential for vehicles accessing the site to result in emissions of NO_2, PM_{10} and $PM_{2.5}$. However, the proposed development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the proposed development satisfy the screening criteria (Section 14.2.4). The traffic data provided for the assessment included cumulative traffic associated with the full masterplan development and other cumulative developments in the area as required (see Traffic and Transport Assessment for further detail). A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. Operational stage effects on air quality are predicted to be ***imperceptible, neutral*** and ***long-term***, which is overall ***not significant*** in EIA terms.

14.5.3 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). It is expected that background pollutant concentrations in the local area will reduce over time as newer vehicle technology becomes more prevalent in the Ireland traffic fleet.

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 14.5.2 and it was found to be ***imperceptible, neutral*** and ***long-term***, which is overall ***not significant*** in EIA terms.

14.6 CUMULATIVE DEVELOPMENT & IMPACTS

14.6.1 Construction Phase

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 500m of the site.

A review of the planned and permitted projects (see Appendix 1.1) within the vicinity of the site was undertaken in order to identify developments with the potential for cumulative construction phase impacts, and it was found that there were a number of relevant substantial development sites within 500m of the site for which cumulative impacts may occur should their construction phase and that of the proposed development overlap.

These include the following developments (planning reference):

- Construction of a 2-storey Education and Research Building, University Maternity Hospital Limerick, Ennis Road, Limerick (2560061);
- Development works from TUS Moylish Campus to the City, Cratloe Road Sexton Street North, High Road Belfield Court and Belfield Gardens, Limerick (228014); and
- Construction of a 5-storey apartment building, Windmill Street and Cogan Street, Limerick (221003).

Additionally, it is proposed to construct the full masterplan development on a phased basis with the potential for later phases of the masterplan development to overlap with that of the proposed development.

There will be at most a high risk of dust impacts associated with the proposed development (see Table 0-10). The dust mitigation measures outlined in Section 14.7.1 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 ***localised*** which is overall ***not significant***.

14.6.2 Operational Phase

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 cumulative traffic associated with the proposed development as well as other specific cumulative developments as required and the overall masterplan development (see Traffic Impact Assessment for further details on specific developments). The cumulative operational phase impact is assessed within Section 14.5.2 and was found to be long-term, neutral, imperceptible and not significant.

14.7 REMEDIAL & MITIGATION MEASURES

14.7.1 Construction Phase Mitigation

The proposed development has been assessed as having a high risk of dust soiling and ecology impacts and a low risk of dust related human health impacts during the construction phase as a result of demolition, earthworks, construction and trackout activities (see Section 14.5.1). 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. These measures are also applicable to rock breaking activities that are required on site. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024),Defra (2012), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site and will be implemented in full by the appointed contractor. The measures are divided into different categories for different activities (see Table 0-11).

Table 0-11 Standard Construction Dust Management Measures

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
Communications	Construction Compound/Site Boundary and throughout (as required)	• An Environmental Manager (EM) will be in assigned by the appointed contractor. The EM will be responsible for co-ordinating the day-to-day management of environmental impacts during the Construction Phase. The EM will be responsible for performing inspections as deemed necessary and manage responses to environmental incidents. The name and contact details of the EM will be responsible for construction dust management and air quality issues will be displayed at the construction compound/site boundary hoarding, as well as head/regional office contact details. • A complaints register will be kept by the appointed contractor detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out. • Previously established community engagement with neighbouring business will continue for the remainder of the construction works.

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
Construction Works Area Management	Construction Compound/Site Boundary and throughout (as required)	• Construction compounds will be laid out so that machinery and dust causing activities such as stockpiles are located away from receptors, as far as is practicable. • The appointed contractor will provide a site hoarding of 2.4m height along noise sensitive boundaries, at a minimum, at the Construction Compounds, which will assist in minimising the potential for dust impacts off-site. Construction works area fencing, barriers and scaffolding will be kept clean using wet methods. • Stockpiles will be covered to prevent wind whipping. • Any chutes and conveyors will be enclosed, and skips will be covered. • Drop heights from any conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised. Fine water sprays will be used on such equipment where visible dust plumes are generated. • Cutting, grinding or sawing equipment will be fitted with or used in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Equipment will be readily available in the construction works areas site to clean any dry spillages. Spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods. • An adequate water supply for effective dust or particulate matter suppression and mitigation will be ensured, and non-potable water will be used where possible and appropriate. • Construction works area runoff of water or mud will be managed as per the Surface Water Management Plan (CEMP, Appendix A5.1 in Volume 4 of this EIAR).
Operating Vehicles / Machinery	Construction Compound/Site Boundary and throughout (as required)	• Engines of all vehicles will be switched off engines when stationary - idling vehicles are not permitted. • The use of diesel- or petrol-powered generators will be avoided and mains electricity or battery powered equipment will be used where practicable. • A Construction Traffic Management Plan (CTMP) has been developed as part of the CEMP to minimise use of the Local Road Network. The CTMP will be adhered to be the appointed contractor. • The appointed contractor will prepare a Construction Stage Mobility Management Plan (CSMMP) to actively discourage personnel from using private vehicles to travel to the Proposed Scheme. The CSMMP will promote the use of public transport, cycling and walking by personnel. Private parking at the Construction Compounds will be limited. Vehicle-sharing will be encouraged, subject to public health guidelines, where travel by private vehicle is a necessity (e.g. for transporting heavy equipment).

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
Demolition Activities	Areas where demolition is required	• During the demolition process, any cutting, grinding or sawing equipment will be fitted or used in conjunction with a suitable dust suppression technique such as water sprays or local extraction. • Prior to demolition blocks will be soft stripped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust), as necessary. • Drop heights from conveyors, loading shovels, hoppers and other loading equipment will be minimised, if necessary fine water sprays will be employed. • Explosive blasting will be avoided, and appropriate manual or mechanical alternatives will be used. • The control of dust emissions from crushing processes will be by the use of suppression and appropriate siting of equipment. Crushers will be fitted with water suppression system over the crusher aperture. Correct operation of high pressure, low volume water sprays over the feed area will provide adequate dust control of the crushing process. • Deposits of dust on external parts of any crushing plant will be cleaned off at the end of each working day in order to minimise the potential for wind entrainment.
Earthworks Activities	Areas where earthworks are required	• Materials with the potential to produce dust, such as excavated material, will be removed from the construction works area as soon as possible, unless being re-used within the construction works area. Management of extracted material is detailed in the Construction and Demolition Resource and Waste Management Plan (CEMP, Appendix A5.1 in Volume 4 of this EIAR). • Areas exposed by earthworks will be re-vegetated to stabilise surfaces as soon as practicable. Hessian, mulches or trackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Cover will only be removed in small areas during work and not all at once. • During dry and windy periods and when there is a likelihood of dust nuisance (defined under “Monitoring” measures below), water-based dust suppression (e.g. bowser) will operate to ensure soil moisture content is high enough to increase the stability of the soil and thus suppress dust.
Construction Activities	Areas where construction is required	• Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process. • Smaller supplies of fine power materials bags will be sealed after use and stored appropriately to prevent dust escaping.

Mitigation Type	Location	Description of Mitigation or Monitoring Measures
Measures specific to trackout (transport of dust and dirt from the construction works areas onto the public road network)	Construction Compound/Site Boundary and throughout (as required)	• A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles. • Vehicles transporting loose materials (e.g. spoil or sand) entering and leaving the Proposed Scheme works areas and construction compounds will be covered with tarpaulin to prevent escape of materials during transport. Before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place. • Where construction work area or construction compound conditions result in large amounts of mud building up on truck wheels, wheel washing will be carried out for trucks before they use the public road network. • Water-assisted dust sweeper(s) will be used at the access points to a construction compound and the immediate adjoining local road, to remove, as necessary, any material tracked out of the compound. • Any on-site haul routes will be inspected for integrity and necessary repairs to the surface will be carried out as soon as reasonably practicable.
Monitoring	Construction Compound/Site Boundary and throughout (as required)	• To determine if any short-term dust impacts will occur, a minimum of daily visual inspections for dust soiling of receptors (including roads, and surfaces such as street furniture, cars and windowsills) adjoining the construction works areas will be undertaken. Inspection results will be recorded in the site inspection log. Cleaning will be provided, if necessary, such as in the event of a dust complaint resulting from the Proposed Scheme construction works. • The potential for dust generation increases when rainfall is less than 0.2 mm/day and at wind speeds of greater than 10 m/s. To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as 12-hour rainfall radar showing anticipated amounts of precipitation in mm. • The frequency of site inspections by the EM responsible for dust management will be increased to a minimum of twice daily during the above conditions. The effectiveness of dust control methods will be monitored via visual inspections and work that would generate dust (e.g. moving materials from stockpiles or transferring loose dry materials from trucks) will be limited in so far as is practicable during these weather conditions.

14.7.2 Operational Phase Mitigation

No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.

14.8 RESIDUAL IMPACTS

14.8.1 Construction Phase

To minimise dust emissions during construction, a series of mitigation measures have been prepared as outlined in Section 14.7. Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are ***short-term, direct, negative, localised*** and ***not significant***.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive 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 will ensure that the impact complies with all EU ambient air quality legislative limit values (set out in Directive (EU) 2024/2881), which are based on the protection of human health (Table 0-1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is ***short-term, direct, negative, localised*** and ***not significant***.

14.8.2 Operational Phase

The operational 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 scoping criteria as discussed in Section 14.2.4. Therefore, the operational phase effect on air quality and human health as a result of increased traffic is ***direct***, ***short-term, neutral*** and ***imperceptible***, which is an overall ***not significant*** impact.

14.8.3 Cumulative Residual Effects

The primary potential cumulative residual effect relates to construction dust emissions. According to the IAQM guidance (IAQM, 2024), if the construction phase of the proposed development coincides with the construction phase of any other large scale permitted projects within 500m of the site, there is a possibility of cumulative residual dust effects occurring at any nearby sensitive receptors. Should simultaneous construction phases occur, it would lead to cumulative residual dust soiling and dust-related effects on human health and ecology, specifically localised to the works area associated with the proposed works.

However, should the construction phases of the development and any localised permitted developments coincide, it is predicted that once the mitigation measures outlined in Section 14.7.1 are put in place impacts will not be significant. Impacts will be ***short-term, negative*** and ***slight*** impact on air quality, which is an overall ***not significant*** impact. No significant cumulative adverse impacts to air quality are predicted for the construction or operational phases.

14.9 WORST CASE SCENARIO

Reasonable conservative estimates have been used as part of this assessment. As a result, Section 14.8 details the worst-case residual effect of the proposed development.

14.10 MONITORING

14.10.1 Construction Phase

The following monitoring measures are to be carried out by the EM to ensure the dust mitigation measures are working satisfactorily:

- To determine if any short-term dust impacts will occur, a minimum of daily visual inspections for dust soiling of receptors (including roads, and surfaces such as street furniture, cars and windowsills) adjoining the construction works areas will be undertaken. Inspection results will be recorded in the site inspection log. Cleaning will be provided, if necessary, such as in the event of a dust complaint resulting from the Proposed Scheme construction works.
- The potential for dust generation increases when rainfall is less than 0.2 mm/day and at wind speeds of greater than 10 m/s. To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as 12-hour rainfall radar showing anticipated amounts of precipitation in mm.
- The frequency of site inspections by the EM responsible for dust management will be increased to a minimum of twice daily during the above conditions. The effectiveness of dust control methods will be monitored via visual inspections and work that would generate dust (e.g. moving materials from stockpiles or transferring loose dry materials from trucks) will be limited in so far as is practicable during these weather conditions.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors (as identified in Section 14.3.3) during the construction phase of the proposed development will be implemented to ensure mitigation measures are working satisfactorily. This will 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.

14.10.2 Operational Phase

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

14.11 REFERENCES

- BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites
- Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
- Department for Environment, Food and Rural Affairs (Defra) (2012) Process Guidance Note 3/16(12) - Statutory guidance for mobile crushing and screening
- Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

- Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (2024) Air Quality in Ireland 2023 (& previous annual reports)
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Government of Ireland (2023) Clean Air Strategy for Ireland
- Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)
- Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)
- Met Éireann (2025) Met Éireann website: https://www.met.ie/
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
- Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107
- UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
- World Health Organisation (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)