CHAPTER 08:

AIR QUALITY

08

CHAPTER CONTENTS

8.0 AIR QUALITY

8.1 INTRODUCTION

This chapter assesses the likely air quality impacts associated with the proposed development at 1 North Wall Quay, Dublin 1. A full description of the development is available in Chapter 2 'Description of Proposed Development'.

8.1.1 Proposed Development

The Proposed Development relates to 1 North Wall Quay, Dublin 1, D01 T8Y1. The proposed development provides for the demolition of the existing building and construction of a new building ranging in height from 9 no. to 17 no. storeys over lower ground floor and double basement comprising of office accommodation, arts/community/cultural uses and a retail/café/restaurant unit. Office accommodation is provided from lower ground floor to 15th floor level, arts/community/cultural uses are provided at lower ground, ground, 1st and 16th floor level with a retail/café/restaurant unit at ground floor level. Landscaped terraces are located at 8th, 9th, 10th, 11th, 15th, 16th floor level with winter terraces located at 4th, 6th 9th floor level. Provision of a new landscaped street to the east of the building to include external arts/community/cultural uses. The double basement comprises 30 no. car parking spaces, 923 no. bicycle parking spaces and 6 no. motorbike spaces as well as shower/changing facilities and plantroom. A full description of the proposed development is outlined in Chapter 2 'Description of the Proposed Development' of this EIAR.

8.1.2 Relevant Legislation and Guidance

This chapter has been prepared having regard to the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (Institute of Air Quality Management (IAQM), 2024);
- Transport Infrastructure Ireland (TII) Guidance Air Quality Assessment of Specified Infrastructure Projects: PE-ENV-01106 (TII, 2022).

8.1.2.1 Development Plans

The Dublin City Council Development Plan 2022 - 2028 (Dublin City Council, 2023) outlines specific objectives in relation to air quality in Chapter 9: Sustainable Environmental Infrastructure and Flood Risk. Environmental Objective *SIO21* and *SIO22* are directly related to air quality:

SIO21 Air Quality Data Collection

"To reduce harmful emissions and to achieve and maintain good air quality in the City by working with the Dublin local authorities and relevant agencies in the collection of local data through the Dublin City ambient air quality monitoring network. "

SIO22 City Ambient Air Quality Monitoring Network

"To maintain and manage a Dublin City ambient air quality monitoring network in conjunction with the EPA and to commit to make available to the public the resulting air quality measurements through the https://dublincityairandnoise.ie/ website in real time, where feasible."

8.2 METHODOLOGY

8.2.1 Criteria for Rating of Impacts

8.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. 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, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for NO_2, PM_{10}, and $PM_{2.5}$ being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$ are set out in Table 8.1.

Table 8.1 *Ambient Air Quality Standards & TA Luft*

Pollutant	Regulation[Note1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m^2/day
NO_x	2008/50/EC	Annual limit value for the protection of vegetation	30 µg/m^3 NO + NO2
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/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 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$) – Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
Particulate Matter (as $PM_{2.5}$) – Stage 2	2008/50/EC	Annual limit for protection of human health	20 µg/m^3 $PM_{2.5}$

[Note 1] EU 2008/50/EC Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

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, the IT4 targets by 2030 and the final targets by 2040 (shown in Table 8.2). 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*". Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

Table 8.2 *WHO Air Quality Guidelines*

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

8.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns, and the EU ambient air quality standards outlined in Table 8.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard 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.

However, guidelines for 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.

8.2.2 Construction Phase Methodology

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 250m of a construction site, the majority of the deposition occurs within the first 50 m. 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 (see Section 8.3.1).

The Institute of Air Quality Management in the UK (IAQM) guidance document *'Guidance on the Assessment of Dust from Demolition and Construction'* (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 in order 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 (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 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.

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.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and, therefore, does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result a detailed air 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.

8.2.3 Operational Phase Methodology

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 8.2.2 was used to determine if any road links are affected by the Proposed Development and require inclusion in a detailed air dispersion modelling assessment. Due to the nature of the Proposed Development there will be minimal vehicles accessing the site during the operational phase. 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 (see Section 8.2.2) and 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.

8.3 RECEIVING ENVIRONMENT

8.3.1 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 Dublin Airport meteorological station, which is located 60 km south of the proposed development. Dublin Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 8.1). For data collated during five representative years (2018 - 2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.4 m/s over the 30-year period 1991 - 2020 (Met Eireann, 2023).

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 from 1991-2020 for Dublin Airport meteorological station indicates that on average 200 days per year have rainfall over 0.2 mm (Met Eireann, 2023) and, therefore, it can be determined that 55% of the time dust generation will be reduced.

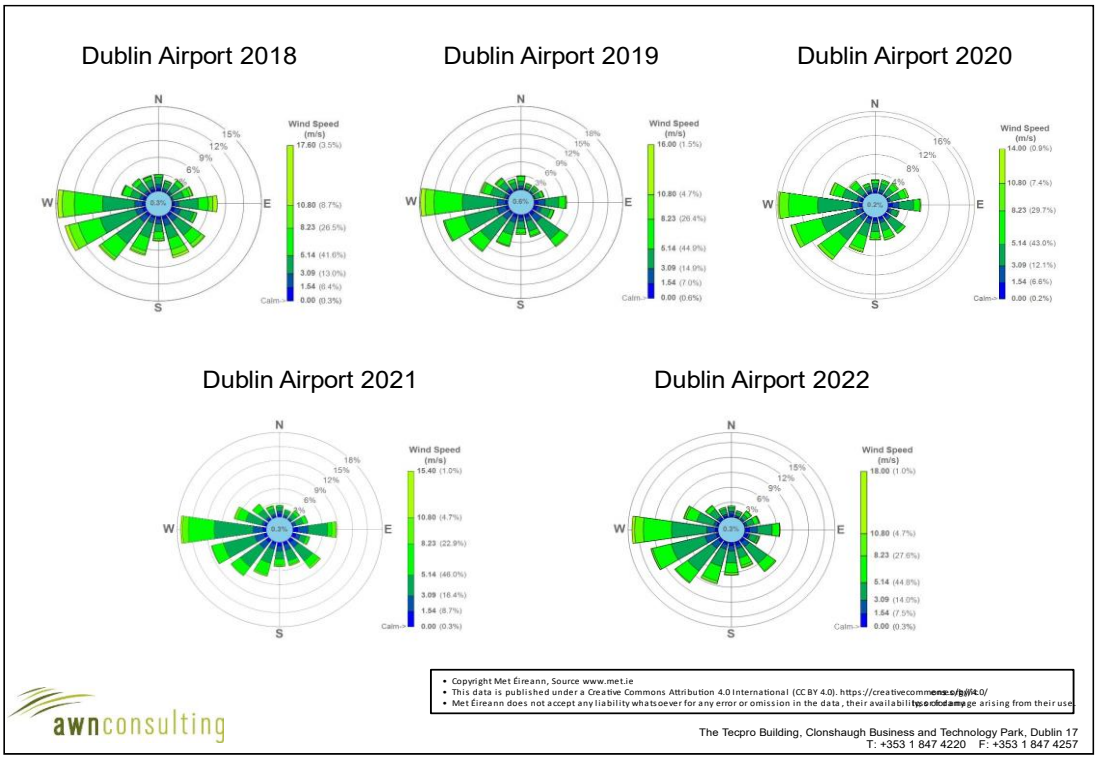

Figure 8.1 *Dublin Airport Windroses 2018 - 2022 (Source: Met Eireann, 2023)*

8.3.2 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 2022*" (EPA, 2023). 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 (EPA, 2023).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2023). 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 A (EPA, 2023).

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.).

8.3.2.1 NO_2

Long-term NO_2 monitoring was carried out at the Zone A urban background locations of Winetavern Street and Rathmines and urban traffic locations of Pearse Street, Ringsend for the period 2018 - 2022,(EPA, 2023). Annual mean concentrations of NO_2 range from 13 - 49 µg/m^3 over the five-year period (**Table 8.3**). Long term average concentrations are significantly below the annual average limit of 40 µg/m^3.

Based on the above information, a conservative estimate of the current background NO_2 concentration in the region of the proposed development is 19 µg/m^3.

Table 8.3 *Trends in Zone A Air Quality - Nitrogen Dioxide (NO_2)*

Station	Averaging Period [Note 1]	Year				
		2018	2019	2020	2021	2022
Winetavern Street	Annual Mean NO_2 (µg/m^3)	29	28	15	18	19
	Max 1-hr NO_2 (µg/m^3)	165	142	121	89	118
Pearse Street	Annual Mean NO_2 (µg/m^3)	-	49	27	36	38
	Max 1-hr NO_2 (µg/m^3)	-	151	142	166	116
Ringsend	Annual Mean NO_2 (µg/m^3)	27	24	18	19	19
	Max 1-hr NO_2 (µg/m^3)	121	109	124	87	129
Rathmines	Annual Mean NO_2 (µg/m^3)	20	22	13	14	14
	Max 1-hr NO_2 (µg/m^3)	138	183	170	143	97

[Note 1] Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). 1-hour limit value - 200 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

8.3.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at the Zone A urban background location of Rathmines and urban traffic location of Winetavern Street, Ringsend and St. John's Road from 2018 - 2022. Concentrations range from 11 - 20 µg/m^3 over the five year period (Table 8.4). Hence, long term concentrations are significantly below the annual limit value of 40 µg/m^3. In addition, there were at most 12 exceedances (in Ringsend) of the 24-hour limit value of 50 µg/m^3 in 2090, albeit 35 exceedances are permitted per year (EPA, 2023). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the development is 15 µg/m^3.

Table 8.4 *Trends in Zone A Air Quality - PM_{10}*

Station	Averaging Period [Note 1]	Year				
		2018	2019	2020	2021	2022
Winetavern Street	Annual Mean PM_{10} (µg/m^3)	14	15	13	12	14
	24-hr Mean > 50 µg/m^3 (days)	1	9	0	0	1
St. John's Road	Annual Mean PM_{10} (µg/m^3)	14	14	13	13	15
	24-hr Mean > 50 µg/m^3 (days)	0	5	0	0	1
Ringsend	Annual Mean PM_{10} (µg/m^3)	20	19	17	16	16
	24-hr Mean > 50 µg/m^3 (days)	3	12	8	6	11
Rathmines	Annual Mean PM_{10} (µg/m^3)	15	15	11	12	15
	24-hr Mean > 50 µg/m^3 (days)	2	9	2	0	4

[Note1] Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). Daily limit value - 50 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

8.3.2.3 $PM_{2.5}$

Continuous $PM_{2.5}$ monitoring was carried out at the Zone A urban background location of Rathmines and urban traffic location of Winetavern Street, Ringsend and St. John's Road from 2018 - 2022. Average $PM_{2.5}$ levels in Ringsend, Pearse Street, Rathmines and St. John's Road over this period ranged from 7 - 10 µg/m^3 (Table 8.5). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 10 µg/m^3.

Table 8.5 *Trends In Zone A Air Quality - $PM_{2.5}$*

Station	Averaging Period [Note 1]	Year				
		2018	2019	2020	2021	2022
Ringsend	Annual Mean $PM_{2.5}$ (µg/m^3)	8	10	8	8	8
Pearse Street	Annual Mean $PM_{2.5}$ (µg/m^3)	-	-	8	8	8
Rathmines	Annual Mean $PM_{2.5}$ (µg/m^3)	9	8	8	9	8
St. John's Road	Annual Mean $PM_{2.5}$ (µg/m^3)	9	9	7	8	8

[Note 1] Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). Daily limit value - 50 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

Based on the above information the air quality in suburban rural areas is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2. There is the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2023).

8.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (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, schools and hospitals.

In terms of receptor sensitivity to dust soiling, there are a number of high sensitivity residential properties in close proximity to the site boundary (see Figure 8.2). There are between 1 and 10 high sensitivity residential receptors within 20 m of the development boundary. Therefore, the sensitivity of the area to dust soiling impacts is considered **medium** based on the IAQM criteria outlined in Table 8.6.

Table 8.6 *Sensitivity of the Area to Dust Soiling Effects on People and Property (IAQM, 2024)*

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

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 and there are between 1 and 10 high sensitivity receptors within 20 m of the proposed development boundary (see Figure 8.2). Based on the IAQM criteria outlined in Table 8.7, the worst-case sensitivity of the area to human health is considered **low**.

Table 8.7 *Sensitivity of the Area to Dust Related Human Health Impacts (IAQM, 2024)*

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			<20	**<50**	**<100**	**<200**	**<250**
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	**Low**	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	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 entrance of a large site. 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.

The closest designated site Royal Canal NHA is 230 m to the east of the site. High sensitivity ecological receptors are sites with European or National designation with particularly dust sensitive species present. These designated areas will be unaffected by dust emissions due to the distance from the works. The designated sites are all more than 50m away from the proposed development which is the area of potential impact as per IAQM guidelines (IAQM 2014). Therefore, impacts from dust emissions on ecology has been screened out of a detailed assessment.

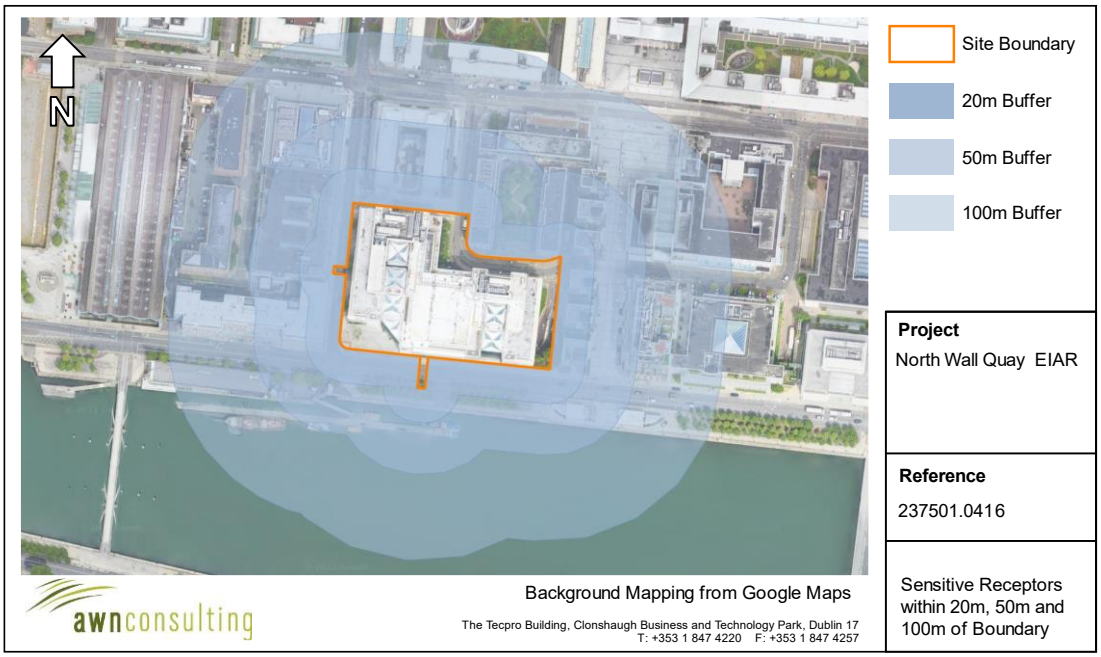

Figure 8.2 *Sensitive Receptors within 20 m, 50 m and 100 m of Site Boundary*

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

8.4.1 Construction Phase

During the construction phase construction dust emission have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, 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. These have been scoped out in Section 8.2.2. Construction phase impacts will be short-term in duration.

8.4.2 Operational Phase

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 NO_2, PM_{10} and $PM_{2.5}$. These have been scoped out in Section 8.2.3. Operational phase impacts will be long-term in duration.

8.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Air Quality

In order 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 (see Section 8.3.3). As per Section 8.2.2, the major dust generating activities are divided into demolition, earthworks, construction and trackout within the IAQM guidance to reflect their different potential impacts.

Demolition

The proposed development comprises the partial demolition of the existing buildings and the construction of a new building ranging in height from 9 no. to 17 storeys over lower ground floor.

Dust emission magnitude from demolition can be classified as small, medium, or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** 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;
- **Medium** Total building volume 12,000 m^3 – 75,000 m^3 potentially dusty construction material, demolition activities 6-12 m above ground level; and
- **Small** 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.

The dust emission magnitude for the proposed demolition activities can be classified as **large** due to the potential for demolition of the existing six storey building, which may result in total building volume of more than 75,000 m^3.

The sensitivity of the area, as determined in Section 8.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 8.8, this results in an overall high risk of dust soiling impacts.

Table 8.8 *Risk of Dust Impacts: Demolition*

Sensitivity of Area	**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

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. 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 or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total site area > 110,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height;
- **Medium** 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;
- **Small** 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.

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 sensitivity of the area, as determined in Section 8.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 8.9, this results in an overall medium risk of dust soiling impacts.

Table 8.9 *Risk of Dust Impacts: Earthworks*

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

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total building volume > 75,000 m^3, on-site concrete batching, sandblasting;
- **Medium** Total building volume 12,000 m^3 - 75,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- **Small** Total building volume < 12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as large as the total building volume will be more than 75,000 m^3. As outlined in Table 8.10, this results in an overall medium risk of dust soiling impacts.

Table 8.10 *Risk of Dust Impacts: Construction*

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

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

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

The dust emission magnitude for the proposed trackout can be classified as medium, as at worst-case peak periods there will likely be between 20 than 50 outward HGV movements per day. As outlined in Table 8.11, this results in an overall medium risk of dust soiling impacts.

Table 8.11 *Risk of Dust Impacts: Trackout*

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

Summary of Dust Emission Risks

The risk of dust impacts as a result of the Proposed Development are summarised in Table 8.12 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a high risk of dust soiling and human health impacts associated with the proposed works. Best practice dust mitigation measures 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***.

Table 8.12 *Summary of Dust Impact Risk used to Define Site-Specific Mitigation*

Potential Impact	**Dust Emission Risk**			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust Soiling Risk	High Risk	Medium Risk	Medium Risk	Medium Risk
Human Health Risk	Medium Risk	Low Risk	Low Risk	Low Risk
Ecological Risk	n/a	n/a	n/a	n/a

There is also the potential for traffic emissions to impact air quality 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 scoping assessment criteria in Section 8.2.2. It can, therefore, be determined that the construction stage traffic will have a ***direct, short-term, negative*** and ***imperceptible*** impact on air quality.

8.5.1.2 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Section 8.3.3, the surrounding area is of low sensitivity to dust-related human health impacts. In addition, there is at most a low risk of dust-related human health impacts as a result of the proposed construction works. In the absence of mitigation there is the potential for ***direct, short-term, negative*** and ***imperceptible*** impacts to human health as a result of construction dust emissions.

8.5.2 Operational Phase

8.5.2.1 Traffic

There is the potential for maintenance vehicles accessing the site to result in emissions of NO_2, PM_{10} and $PM_{2.5}$. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved, 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 (see Section 8.2.2). A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. Operational stage impacts to air quality are predicted to be ***direct, long-term, negative*** and ***imperceptible.***

8.5.2.2 Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. A detailed air dispersion modelling assessment of traffic emissions was conducted and it was determined that emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, it can be determined that the impact to human health during the operational stage is ***direct, long-term, negative*** and ***imperceptible***.

8.5.3 Do-Nothing Impact

Under the Do-Nothing scenario the proposed development will not be constructed. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area. As the site is zoned for development, in the absence of the proposed development it is likely that a development of a similar nature would be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase impacts outlined in this assessment are likely to occur in the future even in the absence of the proposed development.

8.6 MITIGATION MEASURES

8.6.1 Construction Phase

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 8.5.1). 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 medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

8.6.1.1 Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community

engagement includes explaining the nature and duration of the works to local residents and businesses.

- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

8.6.1.2 Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site 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.

8.6.1.3 Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- 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. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

8.6.1.4 Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

8.6.1.5 Operations

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

- 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 and 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.
- 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.

8.6.1.6 Waste Management

- Avoid bonfires and burning of waste materials.

8.6.1.7 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.
- Bag and remove any biological debris or damp down such material before demolition.

8.6.1.8 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.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

8.6.1.9 Measures Specific to Construction

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

8.6.1.10 Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.

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

8.6.1.11 Monitoring

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

8.6.2 Operational Phase

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be ***direct, long-term, negative*** and ***imperceptible.***

8.7 MONITORING OR REINSTATEMENT MEASURES

8.7.1 Construction Phase

Monitoring of construction dust deposition at nearby sensitive receptors during the construction phase of the proposed development will be carried out to ensure mitigation measures are working satisfactorily. This will be done 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. Dust deposition monitoring will be carried out on a monthly basis (between 28 - 32 days) for at least one month (ideally three months) in order to capture baseline conditions pre enabling works, as well as for the duration of the enabling works and construction period. An independent contractor will be appointed to carry out this monitoring. The TA Luft limit value is 350 mg/m^2/day during this monitoring period. Following the laboratory analysis of the monthly monitoring samples (typically 15 day turnaround), results will be reported on a monthly basis. If requested by Fingal County Council this monitoring report will be made available. If dust deposition rates exceed 350 mg/m^2/day, Fingal County Council

will be notified of any exceedance within 24 hours. In the event of an exceedance the procedures, site activities and appropriate application of dust mitigation measures will be reviewed in consultation with Fingal County Council and improved to achieve a level below 350 mg/m^2/day in future monitoring.

8.7.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality are predicted to be imperceptible.

8.8 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

8.8.1 Construction Phase

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared. Provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality impacts during the construction phase are ***direct, short-term, negative,*** 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, which are based on the protection of human health (see Table 8.1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is ***direct, short-term, negative*** and ***not significant***.

8.8.2 Operational Phase

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the relevant air quality standards. Section 8.5.2 determined that the impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be ***direct, long-term, negative*** and ***imperceptible.***

Emissions of air pollutants during the operational phase are predicted to be significantly below the ambient air quality standards, which are based on the protection of human health. Therefore, residual impacts to human health related to air quality will be ***direct, long-term, negative*** and ***imperceptible.***

8.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

Developments that potentially could overlap during the construction phase (within 500m) are included in Appendix 2.1 Relevant Planning History.

8.9.1 Construction Phase

According to the IAQM guidance (2024) there is potential for cumulative construction dust impacts where the construction phase of developments that are within 500m of each other coincide, as dust impacts at nearby sensitive receptors are considered within a 250m buffer from the proposed development and a committed development. However, provided the mitigation measures outlined in Section 8.6.1, are implemented

throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted.

8.9.2 Operational Phase

The impact to air quality during the operational phase of the proposed development will be ***direct, long-term, negative*** and ***imperceptible.*** Therefore, there is no potential for significant cumulative impacts with other development and the impact is predicted to be ***direct, long-term, negative*** and ***imperceptible***.

8.10 INTERACTIONS AND INTERRELATIONSHIPS

8.10.1 Population & Human Health

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is ***short-term***, ***imperceptible*** and ***negative*** with respect to population and human health during construction and ***long-term***, ***imperceptible*** and ***neutral*** during operation phase.

8.10.2 Land, Soils and Geology

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. In this assessment, the impact of the interactions between land and soils and air quality are considered to be ***long-term, imperceptible*** and ***neutral***.

8.10.3 Biodiversity

As set out in Chapter 5 ‘Land, Soils, Geology and Hydrogeology’, dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example. The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity. In this assessment, the impact of the interactions between biodiversity and air quality are considered to be ***long-term, imperceptible*** and ***neutral***.

8.10.4 Traffic & Transportation

Interactions between air quality and traffic (Chapter 12 ‘Traffic and Transportation’) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions

between traffic and air quality are considered to be ***long-term, imperceptible*** and ***neutral***.

8.10.5 Climate

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate chapter (Chapter 9). There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked. In this assessment, the impact of the interactions between climate and air quality are considered to be ***long-term, imperceptible*** and ***neutral***.

8.11 REFERENCES

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