8.0 AIR QUALITY & CLIMATE

8.1 INTRODUCTION

This chapter evaluates the impacts which the proposed development may have on Air Quality & Climate as defined in the Environmental Protection Agency (EPA) documents Draft 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017) and the EPA Draft 'Advice Notes for Preparing Environmental Impact Statements' (2015).

The proposed development comprises the provision of a double circuit 110kV underground transmission line between the existing Belcamp 220kV Substation to the permitted Darndale 110kV Substation. The proposed development will comprise the laying of an underground double 110kV circuit transmission line between the 2 no. substations, which are located approximately 2.1 km apart and are separated by industrial buildings, greenfield lands, parklands and roadways.

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 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 (see Table 8.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate European Commission Directive 2008/50/EC which has set limit values for the pollutants PM_{10}, and $PM_{2.5}$ 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 also includes ambient limit values relating to $PM_{2.5}$.

Pollutant	Regulation Note 1	Limit Type	Value
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health	40 $\mu g/m^3$ PM_{10}
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 $\mu g/m^3$ $PM_{2.5}$

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

Table 8.1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

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 section 8.2.1.1 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. Recommendations from the Department of the Environment, Health & Local Government (DOEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m^2*day) to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

8.2.1.3 Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$. In relation to Ireland, 2020 emission targets are 25 kt for SO_2 (65% below 2005 levels), 65 kt for NO_X (49% reduction), 43 kt for VOCs (25% reduction), 108 kt for NH_3 (1% reduction) and 10 kt for $PM_{2.5}$ (18% reduction).

European Commission Directive 2001/81/EC and the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of four of these transboundary pollutants has been in place since April 2005. The data available from the EU in 2018 indicated that, in 2016, Ireland complied with the emissions ceilings for SO_2, VOCs and NH_3 but failed to comply with the ceiling for NO_X. Directive (EU) 2016/2284 "On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020-29 emission targets are for SO_2 (65% below 2005 levels), for NO_X (49% reduction), for VOCs (25% reduction), for NH_3 (1% reduction) and for $PM_{2.5}$ (18% reduction). In relation to 2030, Ireland's emission targets are for SO_2 (85% below 2005 levels), for NO_X (69% reduction), for VOCs (32% reduction), for NH_3 (5% reduction) and for $PM_{2.5}$ (41% reduction).

8.2.1.4 Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002. For the purposes of the European Union burden sharing agreement under Article 4 of the Kyoto Protocol, in June 1998, Ireland agreed to limit the net growth of the six Greenhouse Gases under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012.

The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emission Trading and burden sharing. The most recent Conference of the Parties to the Convention (COP23) took place in

Bonn, Germany from the 6th to the 17th of November 2017 and focused on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and is an important milestone in terms of international climate change agreements. The "Paris Agreement", agreed by 200 nations, has a stated aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress has also been made on elevating adaption onto the same level as action to cut and curb emissions.

The EU, on the 23rd/24th of October 2014, agreed the "2030 Climate and Energy Policy Framework". The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

In relation to the EU 20-20-20 targets for CO_2, Ireland has a target of a 20% reduction in non-Emission Trading Scheme (non-ETS) greenhouse gas emissions by 2020 relative to the 2005 levels. The EPA confirmed that the 2015 levels are on target but that projections from 2016 – 2020 indicate that the target is unlikely to be met.

8.2.2 Construction Phase

8.2.2.1 Air Quality

The current assessment focuses on identifying the existing baseline levels of PM_{10} and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

8.2.2.2 Climate

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

8.2.3 Operational Phase

8.2.3.1 Air Quality

The assessment methodology involves air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (UK Highways Agency, 2007) (Version 1.03c, July 2007), the NO_x to NO_2 Conversion Spreadsheet (UK DEFRA, 2016) (Version 5.1), and following guidance issued by Transport Infrastructure Ireland (TII, 2011), UK Highways Agency (2007), UK Department for Environment, Food and Rural Affairs (2016b) and the EPA (2002 & 2017a Draft; 2003 & 2015 Draft).

Transport Infrastructure Ireland guidance states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK Design Manual for Roads and Bridges guidance (UK Highways Agency, 2007), on which Transport Infrastructure Ireland guidance was based, 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:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGVs flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

None of the road links impacted by the proposed development satisfied any of the criteria outlined above, therefore no assessment using the DMRB model was required for the proposed development.

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, which is located approximately 2 km north of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 8.1). For data collated during five representative years (2012 - 2016), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds averaging 5.3 m/s for the period 1981 - 2010.

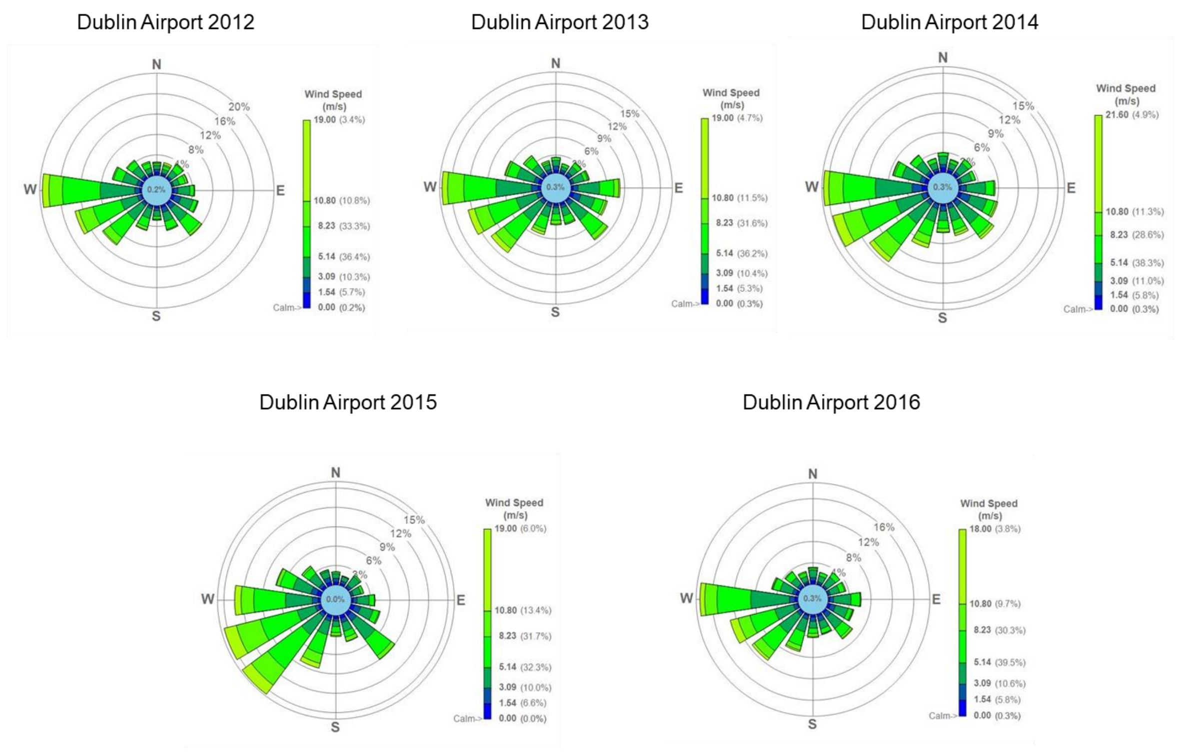

Figure 8.1 Dublin Airport Windrose 2012 – 2016

8.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality “Air Quality Monitoring Annual Report 2016” (EPA 2017b) details the range and scope of monitoring undertaken throughout Ireland.

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 2018). 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, Clonshaugh is categorised as Zone A (EPA 2018).

8.3.2.1 PM_{10}

Continuous PM_{10} monitoring carried out at the suburban background locations of Ballyfermot, Dun Laoghaire and Tallaght showed annual mean concentrations ranging from 11 - 14 µg/m^3 in 2016 (see Table 8.2), with no exceedances of the daily limit value of 50 µg/m^3 (35 exceedances are permitted per year). Sufficient data is available for Dun Laoghaire to observe trends over the period 2011 – 2016. Dun Laoghaire had an average annual mean PM_{10} concentration of 14 µg/m^3 over the period of 2011 – 2016. PM_{10} results from the urban background location in the Phoenix Park show similarly low levels over the period of 2011 – 2016 with concentrations ranging from 11 – 14 µg/m^3. Based on these results, a conservative estimate of the background PM_{10} concentration in the region of the proposed development is 14 µg/m^3.

Station	Averaging Period	Year					
		2011	2012	2013	2014	2015	2016
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	-	-	12	11	12	11
	24-hr Mean > 50 µg/m^3 (days)	-	-	2	2	3	0
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	15	12	17	14	13	13
	24-hr Mean > 50 µg/m^3 (days)	11	1	5	2	3	0
Tallaght	Annual Mean PM_{10} (µg/m^3)	13	-	17	15	14	14
	24-hr Mean > 50 µg/m^3 (days)	4	-	5	2	4	0
Phoenix Park	Annual Mean PM_{10} (µg/m^3)	12	11	14	12	12	11
	24-hr Mean > 50 µg/m^3 (days)	3	0	3	0	2	0

Table 8.2 Trends In Zone A Air Quality - PM_{10}

8.3.2.2 $PM_{2.5}$

Continuous $PM_{2.5}$ monitoring carried out at the Zone A location of Rathmines showed an average concentration of 10 µg/m^3 in 2016. Based on this information, the ratio of $PM_{2.5}$ to PM_{10} is estimated to be in the region of 0.65 – 0.70 with a representative background concentration of 10 µg/m^3 estimated for the region of the proposed development.

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'* (2014) 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.

In terms of receptor sensitivity to dust soiling, there are approximately 16 high sensitivity (residential) receptors are located less than 50 m from the proposed construction works (see Figure 8.2), which is considered a high sensitivity environment for dust soiling according to the IAQM criteria (2014) outlined in Table 8.3. Based on the IAQM criteria outlined in Table 8.3, the worst case sensitivity of the area to dust soiling is considered to be **medium**.

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	**Medium**	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 8.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

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 estimated to be 14 $\mu g/m^3$ and there are approximately 16 high sensitivity receptors located less than 50 m from the proposed construction works. Based on the IAQM criteria outlined in Table 8.4, the worst case sensitivity of the area to human health is considered to be **low**.

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<200
High	< 24 $\mu g/m^3$	>100	Medium	Low	Low	Low
		10-100	Low	**Low**	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 $\mu g/m^3$	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 $\mu g/m^3$	>1	Low	Low	Low	Low

Table 8.4 Sensitivity of the Area to Human Health Impacts

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area within 50 m of the proposed site to ecological impacts from dust. The criteria take into consideration whether the receiving environment is classified as a Special Area of Conservation (SAC), a Special Protected Area (SPA), a Natural Heritage Area (NHA) or a proposed Natural Heritage Area (pNHA) as dictated by the EU Habitats Directive or whether the site is a local nature reserve or home to a sensitive plant or animal species. There are no ecologically sensitive locations within 50 m of the site boundaries, therefore, based on the IAQM criteria, no assessment of the impact of dust on the ecosystem is required.

Figure 8.2 Sensitive Receptors within 50 metres of Proposed Development

8.4 CHARACTERISTICS OF THE DEVELOPMENT

8.4.1 Construction Phase

The proposed development comprises the provision of a double circuit 110kV underground transmission line between the existing Belcamp 220kV Substation to the permitted Darndale 110kV Substation. The proposed development will comprise the laying of an underground double 110kV circuit transmission line between the 2 no. substations which are located approximately 2.1 km apart and are separated by industrial buildings, greenfield lands, parklands and roadways. The key civil engineering works which will have a potential impact on air quality and climate during construction are summarised below:

(i) During construction, an amount of soil will be generated as part of the site preparation works and during excavation for installation of the transmission line.
(ii) Infilling and landscaping will be undertaken.
(iii) Temporary storage of construction materials
(iv) Construction traffic accessing the site will emit air pollutants and greenhouse gases during transport.

As outlined in Section 8.6, a dust minimisation plan will be formulated for the construction phase of the proposed development to ensure no dust nuisance occurs at nearby sensitive receptors.

8.4.2 Operational Phase

There are no works during the operational phase which have a potential to impact on air quality or climate.

8.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Air Quality

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 200m of a construction site, the majority of the deposition occurs within the first 50m. 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.

It is important to note that the potential impacts associated with the construction phase of the proposed development are short-term in nature. When the dust minimisation measures detailed in the mitigation section (see Section 8.6) of this chapter are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

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

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

There are no demolition activities associated with the proposed development. Therefore, there is no demolition impact predicted as a result of the works.

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 > 10,000 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 > 8 m in height, total material moved >100,000 tonnes;

Medium: Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;

Small: Total site area < 2,500 m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as large as worst-case as the total site area will be greater than 10,000 m^2. However, it should be noted that this is a conservative assessment as soil will be excavated in stages and infilled following each stage of excavation.

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 8.5, this results in an overall **medium risk** of temporary dust soiling impacts and an overall **low risk** of temporary human health impacts as a result of the proposed earthworks activities.

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

Table 8.5 Risk of Dust Impacts – Earthworks

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 > 100,000 m^3, on-site concrete batching, sandblasting;

Medium: Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

Small: Total building volume < 25,000 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 medium as a worst-case as the total volume of trench for the cabling will be in the region of 50,840 m^3 but there is unlikely to be any on-site concrete batching.

The sensitivity of the area 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 8.6, this results in an overall **medium risk** of temporary dust soiling impacts and an overall **low risk** of temporary human health impacts as a result of the proposed construction activities.

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

Table 8.6 Risk of Dust Impacts – Construction

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 HDV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;

Medium: 10 - 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;

Small: < 10 HDV (> 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 small, as there are unlikely to be greater than 10 HDV movements per day.

The sensitivity of the area 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 8.7, this results in an overall **low risk** of temporary dust soiling impacts and an overall **negligible risk** of temporary human health impacts as a result of the proposed trackout activities.

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

Table 8.7 Risk of Dust Impacts – Trackout

8.5.1.2 Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 8.8 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.

Overall, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, a range of dust mitigation measures associated with a **medium** risk of dust impacts must be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 8.6) are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	-	Medium Risk	Medium Risk	Low Risk
Human Health	-	Low Risk	Low Risk	Negligible Risk

Table 8.8 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

8.5.1.3 Climate

Construction traffic would be expected to be the dominant source of greenhouse gas emissions as a result of the proposed development. Construction vehicles and machinery will give rise to CO_2 and N_2O emissions during construction of the proposed development.

Due to the short duration and nature of the construction activities, CO_2 and N_2O emissions from construction vehicles and machinery will have a short-term and imperceptible impact on climate.

8.5.2 Operational Phase

8.5.2.1 Air Quality & Climate

There are no potential impacts associated with the proposed development during the operational stage as the transmission line will be buried underground.

8.5.3 Do Nothing Scenario

Under the Do Nothing Scenario no construction works will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery which will not occur. The 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 new developments in the surrounding industrial estates, changes in road traffic, etc.). Therefore, this scenario can be considered ***neutral*** in terms of both air quality and climate.

8.6 REMEDIAL AND MITIGATION MEASURES

8.6.1 Construction Phase

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), The Scottish Office (1996), UK Office of Deputy Prime Minister (2002) and BRE (2003)) and the USA (USEPA (1997)).

8.6.1.1 Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 8.1 for the wind rose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind (to the east or north-east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- 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;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- 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;
- It is the responsibility of the contractor at all times to demonstrate full

compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

8.6.1.2 Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

8.6.1.3 Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

8.6.1.4 Storage Piles

- The location and moisture content of storage piles are important factors which determine their potential for dust emissions.
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK Office of Deputy Prime Minister, 2002);
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger

particles from impacting on nearby sensitive receptors.

8.6.1.5 Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

8.6.1.6 Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

8.6.2 Operational Phase

There are no predicted impacts for the operational phase of the proposed development and therefore, no additional mitigation measures are proposed.

8.7 RESIDUAL IMPACTS OF THE DEVELOPMENT

8.7.1 Construction Phase

8.7.1.1 Air Quality

When the dust mitigation measures detailed in the mitigation section (section 8.6.1) of this report are implemented, fugitive emissions of dust and particulate matter from the site will be ***short-term*** and ***not significant*** in nature, posing no nuisance at nearby receptors.

8.7.1.2 Climate

Based on the scale and temporary nature of the construction works and the intermittent use of equipment, the potential impact on climate change and transboundary pollution from the proposed development is deemed to be ***short-term*** and ***not significant*** in relation to Ireland's obligations under the EU 2020 target.

8.7.1.3 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be ***short-term*** and ***imperceptible*** with respect to human health.

8.7.2 Operational Phase

8.7.2.1 Air Quality & Climate

There are no predicted impacts to air quality or climate during the operational phase of the proposed development. Therefore, the operational phase is considered ***neutral*** for both air quality and climate.

If the mitigation measures outlined in Section 8.6 are implemented, there will be no residual impacts of significance on air quality or climate from the construction or operational phases of the proposed development.

The cumulative impact assessment is addressed in Chapter 15 of this EIA Report.

Interactions are addressed in Chapter 16 of this EIA Report.

8.9 REFERENCES

- BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites
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