7.0 AIR QUALITY

7.1 Introduction

The following Chapter assesses the likely impacts of the Application Site at Ballinderry on the receiving (air) environment.

For quarry restoration activities, the most likely emission to the air environment is dust, which arises predominantly from the transport and deposition of inert waste soils. These sources are generally dispersed sources rather than specific point sources and this dictates the measures required to mitigate dust related impacts.

This Chapter will also describe climatic factors relating to the Ballinderry Application Site. Data on the existing climate conditions was obtained from Met Éireann's weather station at Casement Aerodrome, Baldonnell, Co. Dublin, (ca. 35 km to the east of the Application Site).

7.2 Methodology

The impact of dust is usually monitored by measuring rates of dust deposition. According to the EPA Guideline Document entitled Environmental Management in the Extractive Industries (April 2006), there are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust. There are a number of methods to measure dust deposition but only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – the Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance. It is the only enforceable method available. On this basis, the EPA recommend a dust deposition limit value of **350 mg/m^2/day** (Table 7.1) (when averaged over a 30-day period) be adopted at waste management facilities licensed by the EPA.

Table 7.1: Dust Limit Values

Procedures	Monitoring Frequency	Standard
Dust Emissions	Monthly	<350 mg/m^2/day, Bergerhoff Method

Four dust monitoring points (D1, D2, D3, and D4) have been established at the Application Site to assess the current baseline conditions (Figure 7.1). The locations are at the proposed site boundaries and will assess any impacts of deposition related activities on the existing site and on the local environs.

7.3 Existing Environment

An outline for the Application Site in the regional and local context is provided in Figures 1.1 and 1.2 (Chapter 1.0). The Site itself is a former sand and gravel quarry. The lands surrounding the Application Site can also be predominantly characterised as rural in nature, with land uses in the area being generally agricultural, and single-house residential. The agricultural lands contiguous to the boundaries of the Application Site are used for livestock grazing and tillage. An existing sand and gravel quarry operated by Roadstone is adjacent to the Site to the west and another sand and gravel quarry under GCHL management is approximately 600 m to the south-west. Thin areas of scrub exist along the Application Site's boundary, and a small watercourse (a tributary to the River Glash) runs along the eastern boundary of the Site. There is residential housing in the area, with a number of houses situated to the north and east of the Site. An EPA licenced abattoir and boning hall, Moyvalley Meats, is located 500 m east of the Site.

7.3.1 Climate at the Site

The Irish climate is subject to strong maritime influences, the effects decreasing with increasing distance from the Atlantic coast. The climate in the area of the Application Site is typical of the Irish climate, which is temperate maritime.

The closest Met Éireann station is located at Casement Aerodrome, Baldonnell, Co. Dublin, ca. 35 km to the east of the Application Site. Parameters recorded include minimum and maximum air temperature, mean maximum and mean minimum air temperature, rainfall, minimum grass temperature and highest wind gusts (Table 7.2). Wind speed and direction have been summarised from daily data from January 2012 to April 2018.

Other parameters such as: Mean 10 cm soil temperature at 0900 UTC, Potential Evapotranspiration, Evaporation and Degree Days Below 15.5ºC which are recorded at Oak Park from January 2012 to April 2018 are also included in Table 7.2.

Figure 7.1: Plan showing location of dust monitoring points

Table 7.2: Casement, Co. Dublin recorded Climate Information

Mean Air Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	6.0	6.6	8.5	6.6	10.2	13.1	14.3	15.6	11.9	8.5	6.1	5.2
2013	5.1	4.3	3.1	6.9	10.0	13.5	17.8	15.9	13.2	11.8	6.2	6.8
2014	5.5	5.6	6.8	9.5	11.6	13.9	16.3	13.9	13.7	11.1	7.5	5.3
2015	4.6	3.8	5.8	8.1	9.8	13.3	14.3	14.2	12.0	10.3	8.5	8.5
2016	5.9	4.5	5.9	6.6	11.4	14.2	15.7	15.6	14.3	10.5	5.3	6.7
2017	5.8	6.4	8.0	8.3	12.4	14.4	15.3	14.7	12.5	11.2	6.2	5.2
2018	5.2	3.4	4.5	8.5	-	-	-	-	-	-	-	-

Maximum Air Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	11.8	14.3	19.8	13.1	22	22.7	23.1	22.9	22	14.8	13.5	13.8
2013	13.4	13.2	11.7	16.2	19.8	22.3	28.5	23.6	23.1	20.2	13.7	14.4
2014	12.1	12.1	15	16.7	20.2	24.7	24.9	21.7	21.8	18.2	14.4	12.8
2015	14.8	13.2	13.8	19.1	18.5	25.4	23.3	23.2	19.3	18.1	16.4	14.8
2016	14.1	11.6	14.3	14.4	21	22.4	25.9	23.9	24.9	16.8	15.7	14.8
2017	12.2	14.3	16.0	18.7	24.7	27.4	24.9	22.1	20.2	18.9	13.8	13.2
2018	12.4	12.2	13.1	-	-	-	-	-	-	-	-	-

Minimum Air Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	-2.6	-4.6	0	-3	-3.6	5.5	5.6	6.3	-0.2	-2.6	-3.4	-3.8
2013	-4.1	-4.8	-4.2	-5.9	-0.2	3.8	9.5	7	2.4	0.7	-3.8	-0.1
2014	-1.1	-0.9	-3.3	0.2	3.3	4.5	6.5	4.5	3.3	0.4	-2.7	-4.8
2015	-6.1	-7.2	-5.1	-3.6	0.6	2.1	4.5	5.4	4.2	-0.4	-2.7	-0.7
2016	-2.7	-5.5	-3.7	-2.5	2.4	3.1	7.3	6.9	4.4	0.7	-4	-4.7
2017	-3	-4.1	0.5	-2.2	-0.6	5.5	5.3	5.9	3.7	1.2	-2.3	-6.6
2018	-3.1	-4.5	-5.1	-	-	-	-	-	-	-	-	-

Mean Maximum Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	8.8	9.2	12.7	10.4	14.4	16.6	18.2	19.3	16.2	12	9.2	8.2
2013	7.9	7.3	6.1	11.1	14.5	18	22.7	20	17.2	14.8	9	9.6
2014	8.2	8.5	10.6	13.7	15.4	18.7	21.1	18	18	14.8	10.7	7.8
2015	7.7	7.2	10	13.3	14	18	18.5	18.8	16.2	14.1	12	11.8
2016	8.8	7.9	9.8	10.7	15.8	18.3	19.8	19.6	18	13.8	8.9	10
2017	8.5	9.4	11.4	12.4	17.1	18.5	19.7	19.0	16.5	14.7	9.7	8.0
2018	8.4	6.6	7.9	-	-	-	-	-	-	-	-	-

Mean Minimum Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	3.2	4.1	4.3	2.9	6	9.6	10.3	12	7.6	5.1	3.1	2.2
2013	2.2	1.2	0.1	2.6	5.6	9	12.9	11.7	9.1	8.7	3.3	4
2014	2.8	2.7	2.9	5.3	7.8	9.1	11.6	9.8	9.3	7.5	4.3	2.7
2015	1.4	0.5	1.6	2.9	5.6	8.5	10.2	9.7	7.7	6.5	5.1	5.3
2016	3	1	2.1	2.4	7.1	10.1	11.6	11.5	10.6	7.1	1.8	3.4
2017	3.1	3.4	4.6	4.1	7.7	10.4	10.9	10.4	8.5	7.8	2.6	2.4
2018	2.1	0.1	1.1	-	-	-	-	-	-	-	-	-

Table 7.2 continued: Casement, Co. Dublin recorded Climate Information

Precipitation Amount (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	63.2	19.8	27.5	94.7	64	178.5	102.7	74.9	89.6	84.2	79.8	46.8
2013	69.5	45.2	63.3	47.5	52.8	43.2	42.7	62.9	35.1	100.4	21.2	104.7
2014	110.7	122	56.7	39.3	98.4	31.8	42.3	142	12.9	87.8	138.9	64.1
2015	63.4	30.5	56.4	56.2	96.4	17.4	62.5	67.5	26.2	39.4	114.3	206.3
2016	83.2	68.3	38.7	59.7	62.6	111.3	36.6	63.8	74.9	45.4	38	49.2
2017	26.1	63.6	65.9	8.8	67.1	91.8	42.9	65.4	70.5	57.2	79.5	64.7
2018	91.5	25.5	69.1	-	-	-	-	-	-	-	-	-

Grass Minimum Temperature (^{0}C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	-6.8	-11.8	-5.9	-5.9	-6.7	1	1.4	1.8	-2.5	-4.8	-7.4	-8
2013	-8.1	-8.9	-8.5	-9.5	-3.6	0.3	7.2	4.9	-1.3	-2.3	-7.4	-4.8
2014	-5.8	-3.7	-7.6	-4.6	-0.1	0.6	2.7	0.6	-1.1	-4	-6.5	-9.6
2015	-10.5	-11.2	-7.7	-6.6	-1.9	-3.4	0.3	0.9	-0.2	-3.1	-5.4	-4
2016	-6.7	-9	-7.7	-6.1	-2.9	0.1	3.4	2.5	0.4	-1.8	-7.5	-8
2017	-9.5	-8.6	-6.3	-6.1	-4.7	2.0	1.9	2.6	0.5	-3.4	-5.8	-9.7
2018	-6.8	-6.6	-8.4	-	-	-	-	-	-	-	-	-

Mean Wind Speed (knot)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	13.4	10.1	8.5	9.1	7	8.1	8	8.6	10.4	8.2	10.6	11.2
2013	10.3	8.7	9.6	11.7	10.4	8.5	6.6	9	8.3	9.6	8.8	15.3
2014	12.9	15.9	11	8.6	8.7	5.9	7.7	9.9	5.7	11.1	8	12.8
2015	14.2	9.8	11.7	8.1	11.4	9.5	9.4	8.2	6.8	7	13	15.8
2016	12.2	11.9	9.3	8.7	7.7	6.8	9.4	9.4	10.2	7.2	8.5	9.6
2017	9.1	12.3	10.9	8.1	8.3	9.8	8.7	9.0	9.4	12.2	9.8	11.4
2018	13.4	10.6	10.1	-	-	-	-	-	-	-	-	-

Highest Gust (knot)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	62	41	39	46	39	38	38	45	39	40	52	54
2013	62	45	45	52	45	38	33	34	41	42	42	58
2014	58	65	49	41	41	30	31	34	29	53	49	43
2015	59	56	59	45	39	52	38	39	28	40	59	58
2016	59	51	60	48	36	31	34	40	43	39	43	49
2017	48	62	41	39	38	37	33	40	39	63	38	45
2018	58	53	50	-	-	-	-	-	-	-	-	-

Mean 10cm soil Temp. at 0900 UTC	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	4.3	4.0	5.4	9.2	11.9	15.8	17.1	14.3	13.7	10.3	7.0	4.5
2015	3.7	3.2	4.9	8.2	10.7	14.1	15.1	14.6	12.0	9.8	8.3	7.4
2016	4.9	4.0	5.4	7.5	12.5	15.4	16.2	15.6	13.9	9.9	5.4	5.5
2017	4.9	5.0	6.8	8.9	12.7	15.2	16.1	14.7	12.6	11.0	6.8	4.8
2018	4.0	2.3	3.5	8.1	-	-	-	-	-	-	-	-

Table 7.2 continued: Casement, Co. Dublin recorded Climate Information

Potential Evapotrans. (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	15.5	21.1	33	56	64.7	85.8	88.3	68.4	45.2	32.2	13.1	12.8
2015	15.4	15.6	36.9	57.8	68.2	91.2	80.4	72.3	47.2	26.3	15.5	16.9
2016	14.1	18	33.9	48.8	80.5	76.9	88.8	70.9	47.5	28	11.9	13.4
2017	13.7	19.6	34.8	49.7	89.1	84.4	90.4	73.0	46.1	27.0	12.1	11.0
2018	16.1	19.4	29.3	53.8	-	-	-	-	-	-	-	-

Evaporation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	21.1	32.1	49.9	82.2	93.5	118.4	121.9	98.8	61.5	44.1	17.5	17
2015	21.3	23.4	56.2	85.7	107.1	132	114.9	102.2	65.2	35.9	21.6	22.3
2016	19.2	26.7	50.5	73.6	117.2	108.6	128.9	101.9	67	38	16.1	17
2017	17.8	28.1	52.2	71.9	126.8	122.8	127.8	103.8	65.7	38.5	16.4	14.7
2018	21.9	27.8	43.9	81.0	-	-	-	-	-	-	-	-

Degree Days Below 15.5^{0}C	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	309	278	271	181	127	74	38	72	75	139	240	317
2015	338	327	301	226	179	94	64	68	113	163	210	217
2016	297	320	297	268	134	67	45	38	67	157	305	272
2017	300	255	234	218	116	63	48	58	102	136	279	320
2018	318	339	341	213	-	-	-	-	-	-	-	-

An important meteorological parameter with regard to the dilution and dispersal of air pollutants is wind speed and direction. A windrose for the Casement station is presented in Figure 7.2 for the period January 2012-April 2018 inclusive. It is evident that the prevailing winds are from a south-westerly direction.

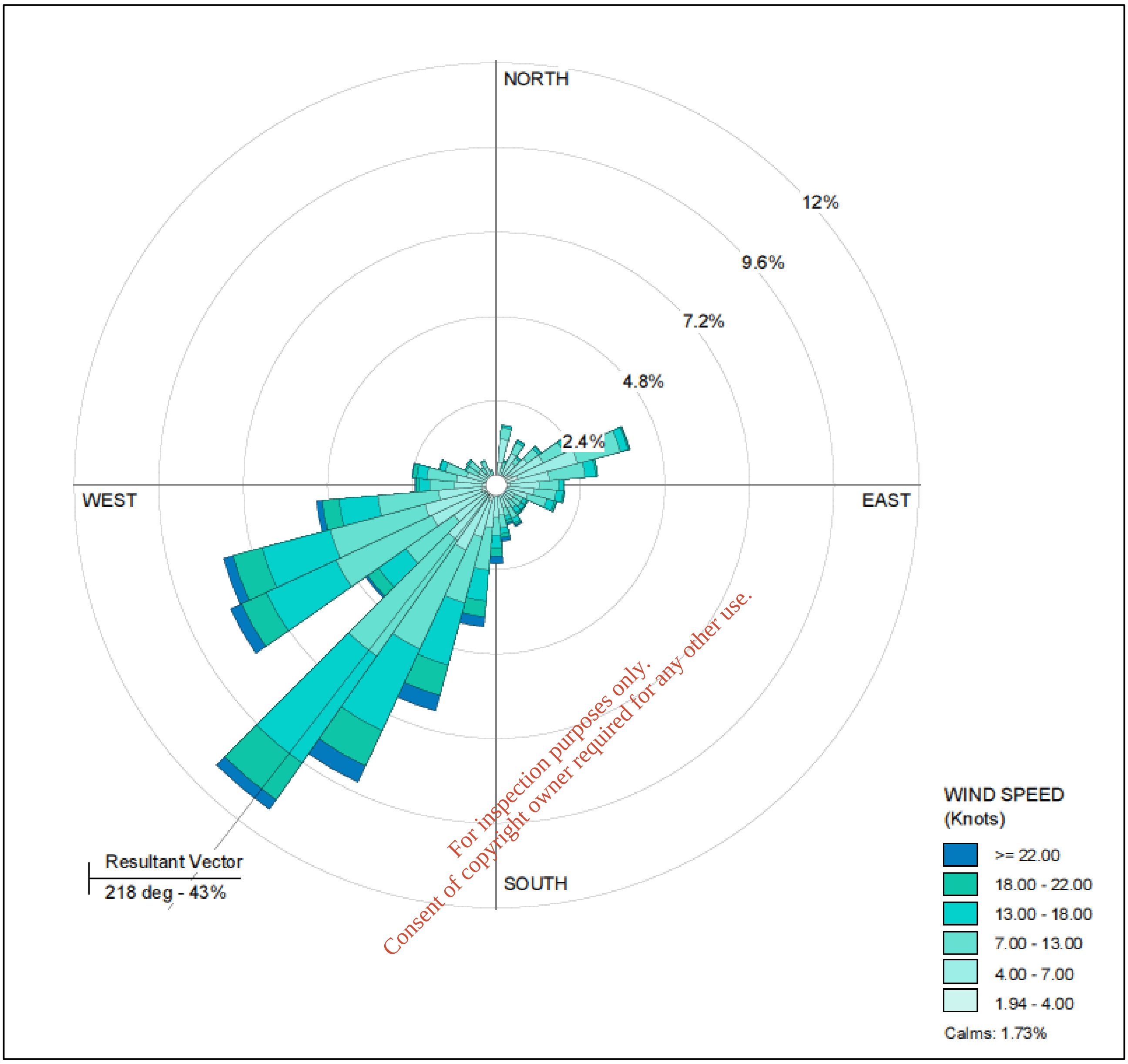

Figure 7.2: Dominant wind direction at Casement Aerodrome over five years, (Assessment Period January 2012 to April 2018)

7.3.2 Characteristics of the Proposed Development

The deposition rate for the proposed development is for approximately 400,000 tonnes per year, depending on market conditions.

The following activities associated with the proposed development are the most likely dust generating sources:

- Movement of full and empty trucks along haul roads;
- Movement of overburden to dump areas;
- Tipping of materials;
- Unloading of overburden for restoration; and
- Wind erosion at dump areas and exposed faces.

7.4 Climate Change

Ireland's greenhouse gas emissions per person are amongst the highest on the planet and the fourth highest of the EU 28 countries. The reduction in greenhouse gas emissions in Ireland and other parts of the globe, which is primarily due to the global financial crisis, has shown that there is still a strong link between economic growth and emissions (EPA, 2011). The most recent emissions figures compiled show that in Ireland agriculture is the single largest contributor to the overall emissions, at 33.0% of the national total, followed by transport at 19.8 and energy at 19.7%. The remainder is made up by the residential sector at 10.1%, manufacturing and combustion at 7.6%, and industrial processes at 3.3% (DCCAE, 2017).

Ireland is a party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, which together provide an international legal framework for addressing climate change. In December 2015, an ambitious new legally binding, global agreement on climate change was agreed in Paris. The Paris Agreement aims to restrict global temperature rise to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C. The EPA's 2020 Vision strategy sets out our vision for Ireland's environment over the coming decade and beyond. The strategy aims to achieve results in a number of critical areas, including climate change, and is set within the framework of sustainable development. The EPA recognises that social, economic and environmental issues are interconnected and that good decisions and policy should encompass these three elements in a balanced and harmonious way. The 2020 Vision outlines six environmental goals, reflecting the main challenges identified by the EPA for Ireland as well as key issues at global and EU levels (EPA, 2011). These goals are:

- Limiting and adapting to climate change;
- Clean air;
- Protected waters;
- Protected soil and biodiversity (native plants and animals);
- Sustainable use of natural resources (water, energy and materials); and
- Integration and enforcement.

7.5 GCHL and Climate Change

GCHL has acknowledged the challenges that climate change presents to humanity and their business and are committed to developing pragmatic and sustainable solutions.

GHCL strive for compliance with all relevant legislation, prevention of pollution and continuous improvement in all areas of environmental management in all of their operations and activities. The operations at Ballinderry will have a dedicated Environmental Management System (EMS) to govern day-to-day operations and will employ professionals in Environmental & Planning to help them lead the way in environmental management.

The restoration of the Site to agricultural use through the importation of inert soils and stone will have a beneficial effect through the sequestration of atmospheric carbon in soils. Carbon sequestration is the process of carbon being transferred from the atmosphere to the terrestrial biosphere (soil or vegetation). Temperate grasslands have a strong potential to store carbon belowground in roots and soil, which is currently not accounted for in Ireland's greenhouse gas accounting methods (RIA, 2016; Teagasc, 2018).

7.6 Assessment

7.6.1 Dust Monitoring Locations

In order to establish potential impacts from waste deposition activities proposed at the Application Site and quarrying activities in its environs, four dust monitoring locations were established. Descriptions of the dust monitoring locations are presented in Table 7.3 below and their locations are shown in Figure 7.1.

Table 7.3: Description of Dust Monitoring Locations

Location	Description
D1	Located in the south east corner of the Site adjacent to the L1002 public road

Location	Description
D2	Located on the north-eastern corner of the Site adjacent to the L5004 public road and a group of residential dwellings
D3	Located to the north-western corner of the Site adjacent to the L5004 public road
D4	Located to the south-western corner of the Site adjacent to the neighbouring quarry

The monthly dust monitoring results for dust deposition rates from 19 April 2018 to 14 May 2018 are shown in Table 7.4. Dust samples were placed in-situ for a period of 30 days, +/- 2 days.

Table 7.4: Total Particulates Data Results for April 2017 to May 2017, Results in mg/m²/day.

2017	Apr-May
D1	82.4
D2	73.4
D3	48.6
D4	66.0

The records from April to May show no exceedances of the 350 mg/m²/day recommend dust deposition limit value. This is reflective of the baseline environment at the Site.

Dust generation rates depend on the Site activity, particle size, the moisture content of the material and weather conditions. Dust emissions are dramatically reduced where rainfall has occurred due to the cohesion created between dust particles and water and the removal of suspended dust from the air. It is typical to assume no dust is generated under "wet day" conditions where rainfall greater than 0.2 mm has fallen. Information collected from Met Eireann's Casement Meteorological Station (January 2012 to May 2017) identified that 997 days over the period are "wet" (approximately 50% of days in that period).

Large particle sizes (greater than 75 microns) fall rapidly out of atmospheric suspension and are subsequently deposited in close proximity to the source. Particle sizes of less than 75 microns are of interest as they can remain airborne for greater distances and give rise to the potential dust nuisance at the sensitive receptors. This size range would broadly be described as silt. Emission rates are normally predicted on a site-specific particle size distribution for each dust emission source.

7.7 Mitigation

The main potential impact during development will be due to airborne dust and potential dust deposition outside the Application Site boundaries. During long spells of dry weather, dust emissions can potentially be more elevated, however dust nuisance from the proposed operation is expected to be unlikely once mitigation measures are implemented during production and restoration. Details of mitigation measures that will be employed at the Application Site are summarised below:

- Retention and enhancement of existing vegetation at the Site perimeter;
- Dust monitoring will continue to be carried out monthly at the four designated monitoring locations;
- The timing of operations will be optimised in relation to meteorological conditions;
- Material in outdoor stockpiling will be conditioned with water to minimise dust during dry and windy conditions. In addition, stockpiles will be sited to take advantage of shelter from wind;
- Overburden mounds will be grass-seeded and planted to eliminate wind-blown dust;
- Plant will be regularly maintained;
- Internal haul roads will be compacted and maintained;
- A water bowser/sprayer will be available at all times to minimise dust during dry and windy conditions;
- On site speed restrictions (<25 kph) will be maintained in order to limit the generation of fugitive dust emissions; and

- All vehicles exiting the Site will exit through the proposed wheelwash.

7.7.1 Air quality – Vehicle Emissions

Emissions of CO_2 from vehicle exhaust during the development can add to the receiving air environment. As it is a key gas linked to climate change, the following mitigation measures will be put in place to limit vehicle and plant emissions:

- No vehicles or plant will be left idling unnecessarily;
- Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately and any problem rectified before being used; and
- Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests.

The adoption of these mitigation measures will ensure that the resulting impact significance is no greater than slight.

7.7.2 Assessment of Impacts and Mitigation Measures

Table 7.3 assess the potential impacts from the proposed development on the local microclimate and air quality both with and without the establishment of appropriate mitigation measures (detailed in Section 7.7 and 7.7.1). Definitions of effect significance is as defined in the EPA's 2017 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports'. It is considered that the impact from vehicle emissions will have an imperceptible effect in the medium term whilst the Site is being actively restored. An 'imperceptible effect' is defined as An 'effect capable of measurement but without noticeable consequences'.

Without mitigation measures it is considered that dust impacts from deposition activities may not affect the character of an environment but would have noticeable changes. Through the implementation of mitigation measures it has been demonstrated that the dust from various activities has an effect capable of measurement but without noticeable consequences to the environment.

Upon restoration and the establishment of agricultural lands and the maturity of the planted areas of the Application Site there will be a permanent effect (>60 years) of carbon sequestration, resulting in a positive effect on the microclimate.

Table 7.5: Assessment of Impacts to Climate and Air Quality and Mitigation Measures employed

Impact	With / Without the establishment of Mitigation Measures	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
Vehicle emissions	Without	Direct	Negative	Imperceptible	M-T
Vehicle emissions	With	Direct	Negative	Imperceptible	M-T
Dust from deposition	Without	Direct	Negative	Slight	M-T
Dust from deposition	With	Direct	Negative	Imperceptible	M-T
Dust from transfer on haul roads	Without	Direct	Negative	Slight	M-T
Dust from transfer on haul roads	With	Direct	Negative	Imperceptible	M-T
Dust from transfer on public roads	Without	Direct	Negative	Slight	M-T
Dust from transfer on public roads	With	Direct	Negative	Not Significant	M-T

Notes:

- Type of Effect – Direct and Indirect
- Quality of Effects – Positive; Neutral and Negative
- Significance of Effects – Imperceptible; Not significant; Slight Effects; Moderate Effects; Significant Effects; Very Significant; and Profound Effects
- Duration of Effects – Momentary Effects (Seconds to minutes); Brief Effects (Less than a day); Temporary Effects (Less than a year); Short-term Effects (1 to 7 years); Medium-term Effects (7 to 15 years); Long-term Effects (15 to 60 years); and Permanent Effects (Lasting over 60 years)

7.8 Residual Impacts

Residual impacts of the development on air quality, microclimate and climate change are considered to be imperceptible. During long spells of dry weather, dust emissions can potentially be more elevated, however dust nuisance from the operation is expected to be unlikely if the above mitigation measures are implemented during restoration. The overall impact from the proposed restoration is **not significant** to **imperceptible** to the air environment.

Upon completion of the site restoration, the concentration of airborne dust would expected to be reduced from operational levels as the result of covering and seeding of exposed, un-vegetated soil surfaces. This will most likely constitute a minor **positive impact** for the local environment.

7.9 Cumulative Impacts

Research has shown that the greatest proportion of dust predominately deposits within the first 100 m away from the source (*The Environmental Effects of Dust from Surface Mineral Workings, Volume 1 DETR, HMSO 1995*) as they have a higher deposition velocity than finer particles (i.e. PM10 and PM2.5). The finer particles of less than 10 microns aerodynamic diameter may remain airborne for longer and therefore travel larger distances, although a large proportion may still deposit within 200 m of the source.

Other extractive industries and industries which have the potential to effect air quality from dust generation in the area include Roadstone and GHCL which are located near to the Application Site to the west. However, with the implementation of the mitigation measures proposed in Section 7.7 cumulative impacts related to air quality are not envisaged as a result of proposed activities at the Application Site in Ballinderry.

7.10 References

Environmental Protection Agency (2011) The EPA & Climate Change: Responsibilities, challenges and opportunities 2011 Update.

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