Dust Management Plan	
Hamble Lane, Hampshire	
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Client:	Cemex
Prepared by:	Mr Bob Thomas

Air Quality Assessments Ltd
Tel: 07940 478134
Email: bob@aqassessments.co.uk
Web: http://aqassessments.co.uk

Registered Office: c/o Ardwyn Channon, 12 Victoria Street, Burnham-on-Sea, Somerset, TA8 1AL
Companies House Registration: 8895617

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1 Introduction

1.1.1 Air Quality Assessments Ltd (AQA) has been commissioned by Cemex to prepare a Dust Management Plan (DMP) for proposed sand and gravel extraction and restoration at land to the east of Hamble Lane, Hamble, Hampshire, referred to in the rest of this document as 'the site'.

1.1.2 A planning application for the proposed development has been submitted to Hampshire County Council (Application Reference: HCC/2021/0787) and a full air quality and dust risk assessment completed as part of the Environmental Statement (ES) submitted in support of the planning application.

1.1.3 The DMP is a working document that sets out the management and control procedures that will be used at the site to manage dust. The DMP aims to ensure that dust assessment forms part of daily inspections, and that dust is primarily controlled by good operational practices, with appropriate measures undertaken to prevent dust beyond the site boundary.

1.1.4 The air quality chapter of the ES included a qualitative dust risk assessment, undertaken using the source-pathway-receptor approach set out in Institute of Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016). The dust risk assessment has been reproduced in this DMP, and the outcome used to inform mitigation and monitoring requirements.

1.1.5 The DMP includes the following:

- A general description of the site, it's location and the on-site operations;
- A description of the likely dust sources, pathways and receptors;
- The control procedures used to manage dust at the site on a daily basis;
- The roles and responsibilities of site personnel;
- Trigger levels and risk factors and the corrective actions to be taken during abnormal conditions;
- The monitoring and auditing of the effectiveness of the control procedures; and
- Details of responsibilities regarding record keeping, and the implementation and maintenance of this DMP.

2 Site Location and Operations

2.1. Site Location

2.1.1 The site borders Hamble Lane to the west, Satchell Lane to the east, the railway line to the north, and various residential roads and the Roy Underdown Pavilion and green to the south. The planning application site boundary is shown in **Figure 1**.

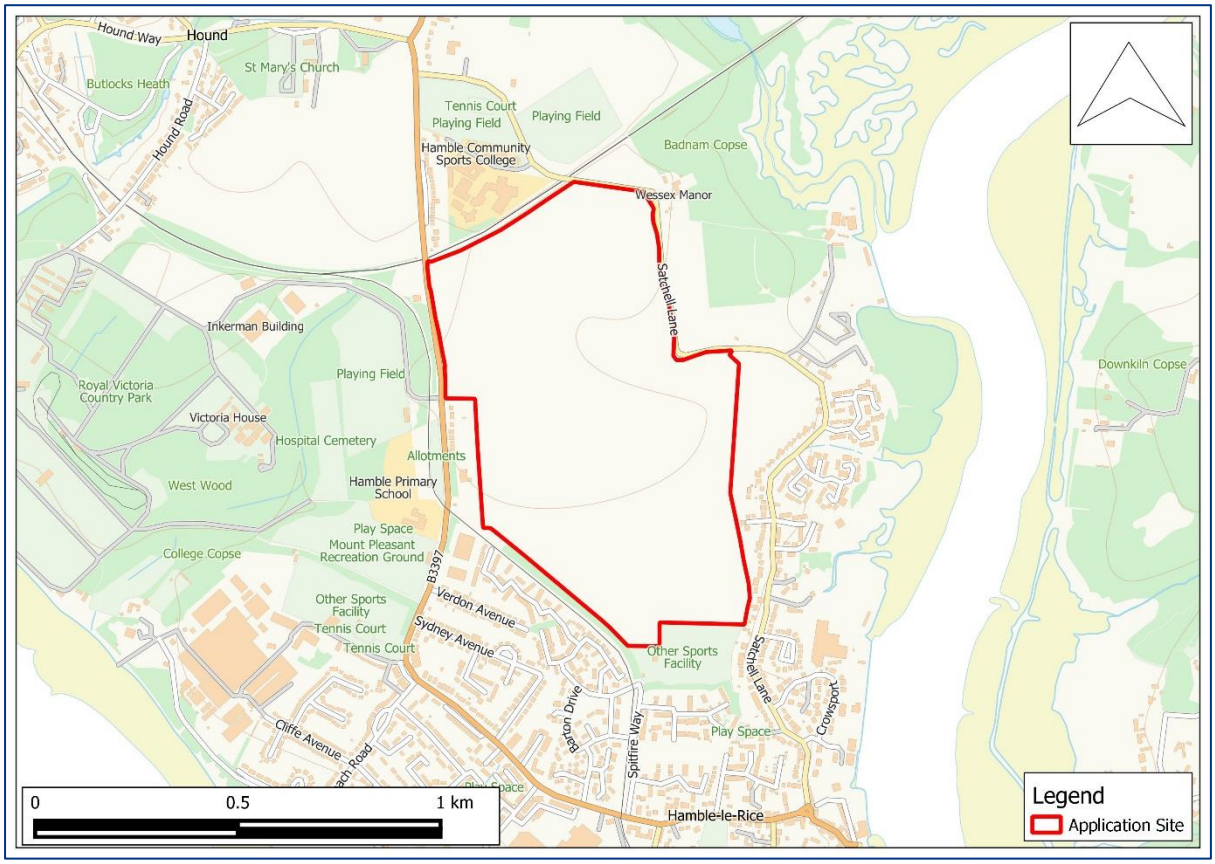

Figure 1: Site Location
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2.2. Site Operations

2.2.1 Three principal operations will be undertaken at the site;

- The extraction of sand and gravel;
- Processing of the extracted sand and gravel, i.e., washing and grading;
- Restoration of the site to parkland and grazing land using imported inert materials.

3 Dust Risk Assessment

3.1. Methodology

3.1.1 The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning includes an assessment methodology, which has been used to determine the magnitude of dust effects due to operations at the site.

3.1.2 Locations sensitive to dust emitted during site operations will be places where members of the public are regularly present. Residential properties and commercial operations close to the site will be most sensitive to operational dust. Any areas of sensitive vegetation or ecology that are very close to dust sources may also be susceptible to some negative effects.

3.1.3 The IAQM minerals dust guidance describes a qualitative source-pathway-receptor approach to determine the risk of dust effects. The assessment method uses a number of steps to determine the site characteristics and baseline conditions, an estimate of the dust impact risk and an estimate of the likely magnitude of effects. Potential dust sources and activities have been identified and the risk of impacts at sensitive receptors determined based on the prevailing meteorological conditions and topography, the likely magnitude of emissions (with mitigation in place) and the distances over which effects may occur.

3.1.4 The IAQM minerals dust guidance divides activities on minerals sites into types to reflect their different potential impacts:

- Site preparation/restoration;
- Mineral extraction;
- Material handling;
- On-site transportation;
- Mineral processing;
- Stockpiling/exposed surfaces;
- Site restoration; and
- Off-site transportation.

3.1.5 A series of steps then consider the potential impact due to:

- The risk of health effects from an increase in exposure to fine particulate matter (PM_{10});
- annoyance due to the deposition of dust;
- harm to the natural environment.

3.1.6 A detailed dust risk assessment would usually be required where there is a human or sensitive ecological receptor within 250m of a sand and/or gravel site, or within 400m of a hard rock quarry, measured from the nearest dust generating activities. Where there are no sensitive receptors within 250m of a sand and/or gravel site, it would normally be assumed that a detailed dust assessment is not required. Therefore, receptors further than 250m from potentially dust generating activities have not been included in the risk assessment.

3.1.7 The sensitivity of receptors is defined in **Table 1**, **Table 2** and **Table 3**; however, professional judgement should be used to identify where on the spectrum between high and low sensitivity a receptor lies.

Table 1: Sensitivities of People to Dust Soiling

Class	Principles	Examples
High	Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected a to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	Parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.	Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

Table 2: Sensitivities of People to PM_{10}

Class	Principles	Examples
High	Locations where members of the public may be exposed for eight hours or more in a day.	Residential properties, hospitals, schools and residential care homes.
Medium	Locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	Office and shop workers, but will generally not include workers occupationally exposed to PM_{10}
Low	Locations where human exposure is transient.	Public footpaths, playing fields, parks and shopping streets.

Table 3: Sensitivities of Receptors to Ecological Effects

Class	Principles	Examples
High	Locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species.	Special Areas of Conservation (SAC) with dust sensitive features.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition.	Sites of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition.	Local Nature Reserves with dust sensitive features.

Dust Impact Risk and Magnitude of Dust Effect

3.1.8 The amenity dust impact risk is determined by combining the residual source emissions and the pathway effectiveness, as shown in **Table 4**. The magnitude of the dust effect is then described by combining the dust impact risk with the receptor sensitivity, as shown in **Table 5**. The significance of the effect on amenity is determined to be either significant or not significant. The judgement of significance should be made by a competent, suitably qualified professional, and the professional experience of the consultant preparing this report is set out in **Appendix A1**.

3.1.9 With regard to health effects, the IAQM minerals guidance takes the approach that, if background ambient PM_{10} concentrations are below 17µg/m^3, there is little risk that a process contribution from a dust source would lead to an exceedance of the objectives. Should the background PM_{10} concentration at receptors within 250m of dust generating activities be less than 17µg/m^3, the impact from the proposed development on health is deemed to be not significant.

Table 4: Estimation of Dust Impact Risk

Pathway Effectiveness	Residual Source Emissions		
	Small	**Medium**	**Large**
Highly Effective	Low	Medium	High
Moderately Effective	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

Table 5: Descriptors for Magnitude of Dust Effects

Dust Impact Risk	Receptor Sensitivity		
	Low	**Medium**	**High**
High	Slight Adverse	Moderate Adverse	Substantial Adverse
Medium	Negligible	Slight Adverse	Moderate Adverse
Low	Negligible	Negligible	Slight Adverse
Negligible	Negligible	Negligible	Negligible

Residual Source Emissions

3.1.10 The IAQM guidance sets out examples of the residual source emissions magnitude for a number of activities (see **Table 6**). The residual source emissions take account of designed in mitigation measures and landscaping.

Pathway Effectiveness

3.1.11 A frequency category, derived from wind and rainfall data (**Table 7**), and a receptor distance category (**Table 8**) are combined in a matrix (**Table 9**) to classify the pathway effectiveness.

Table 6: Examples of Residual Source Emissions Magnitude

Large	Small
Site Preparation / Restoration	
Large working area (>10ha)	Small working area (<2.5ha)
High bunds (>8m)	Low bunds (<4m)
High volume of material movement (>100,000m^3)	Low volume of material movement (<20,000m^3)
High no. of heavy plant (>10 simultaneously active)	Low no. of heavy plant (<5 simultaneously active)
Minimal seeding/sealing of bund surface	Bunds seeded/sealed immediately
Material of high dust potential (fine grained, friable)	Material of low dust potential (high moisture content)
Mineral Extraction	
Large working area (>100ha)	Small working area (<20ha)
High energy extraction methods (drilling and blasting)	Low energy extraction methods (hydraulic excavator)
Material of high dust potential (small particle size and/or low moisture content)	Material of low dust potential (coarse material and/or high moisture content)
Potential high extraction rate (1,000,000 tpa)	Low extraction rate (<200,000 tpa)
Materials Handling	
High no. heavy plant (>10 loading plant)	Low no. of heavy plant (<5 loading plant)
Unconsolidated / bare surface	Hard standing surface
Activities close to site boundary (<50m of site boundary)	Activities within quarry void or >100m of site boundary
Material of high dust potential	Material of low dust potential
On-site Transportation	
Unconsolidated/unpaved haul road	Conveyors and/or paved haul road
Road surface of high dust potential	Road surface of low dust potential
High no. of HDV movements (>250)	Low no. of HDV movements (<100)
High total haul road length	Low total haul road length (<500m)
Uncontrolled vehicle speed	Controlled vehicle speed (<15 mph)
Mineral Processing	
Raw material of high dust potential (hard rock)	Raw material of low dust potential (wet sand/gravel)
End product of high dust potential (cement)	End product of low dust potential
Complex or combination of processes	Single process
High volume of material processed (>1,000,000 tpa)	Low volume of material processed (<200,000 tpa)

Large	Small
Stockpiles / Exposed Surfaces	
Long term stockpile (>12 months)	Short term stockpile (<1 month)
Frequent material transfers (daily)	Infrequent material transfers (weekly)
Material of high dust potential	Material of low dust potential
Unconsolidated ground surface	Hardstanding
Stockpiles close to boundary (<50m)	Stockpiles well within quarry void or away from boundary (>100 m)
Large areas of exposed surfaces (>10ha)	Small areas of exposed surfaces (<2.5 ha)
High wind speeds / low dust threshold	Low wind speeds / high dust threshold
Large quarry production (1,000,000 tpa)	Small quarry production (<200,000 tpa)
Off-site Transportation	
High no. HDV movements (>200/day)	Low no. HDV movements (<25/day)
Unconsolidated access road	Paved access road
Limited/no vehicle cleaning facilities	Extensive vehicle cleaning facilities
Small length of access road (<20m)	Large length of access road (>50m)

Table 7: Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

Table 8: Categorisation of Receptor Distance from Source

Receptor Distance Category	Criteria
Distant	Receptor is between 200m and 400m from dust source
Intermediate	Receptor is between 100m and 200m from dust source
Close	Receptor is less than 100m from dust source

Table 9: Pathway Effectiveness

Receptor Distance Category	Frequency of Potentially Dusty Winds			
	Infrequent	**Moderately Frequent**	**Frequent**	**Very Frequent**
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

3.2. Dust Risk Assessment

Receptors

3.2.1 It is commonly accepted that the greatest impacts on dust deposition will occur within 100m of an emissions source (IAQM, 2016). Receptors have been identified to represent locations where the worst-case impacts are likely to occur due to dust generating activities, as shown in **Figure 2** and described in **Table 10**. The sensitivity of the receptors areas has been determined based the information in **Table 1**, **Table 2** and **Table 3**.

Table 10: Dust Receptors

Receptor Area	Description	Receptor Sensitivity	
		Dust Soiling	**PM_{10}**
D1	Dwelling	High	High
D2	Hamble School	High	High
D3	Dwelling	High	High
D4	Dwelling	High	High
D5	Dwelling	High	High
D6	Dwelling	High	High
D7	Commercial	Medium	Medium
D8	Dwelling	High	High
D9	Ancient Woodland	Medium	n/a

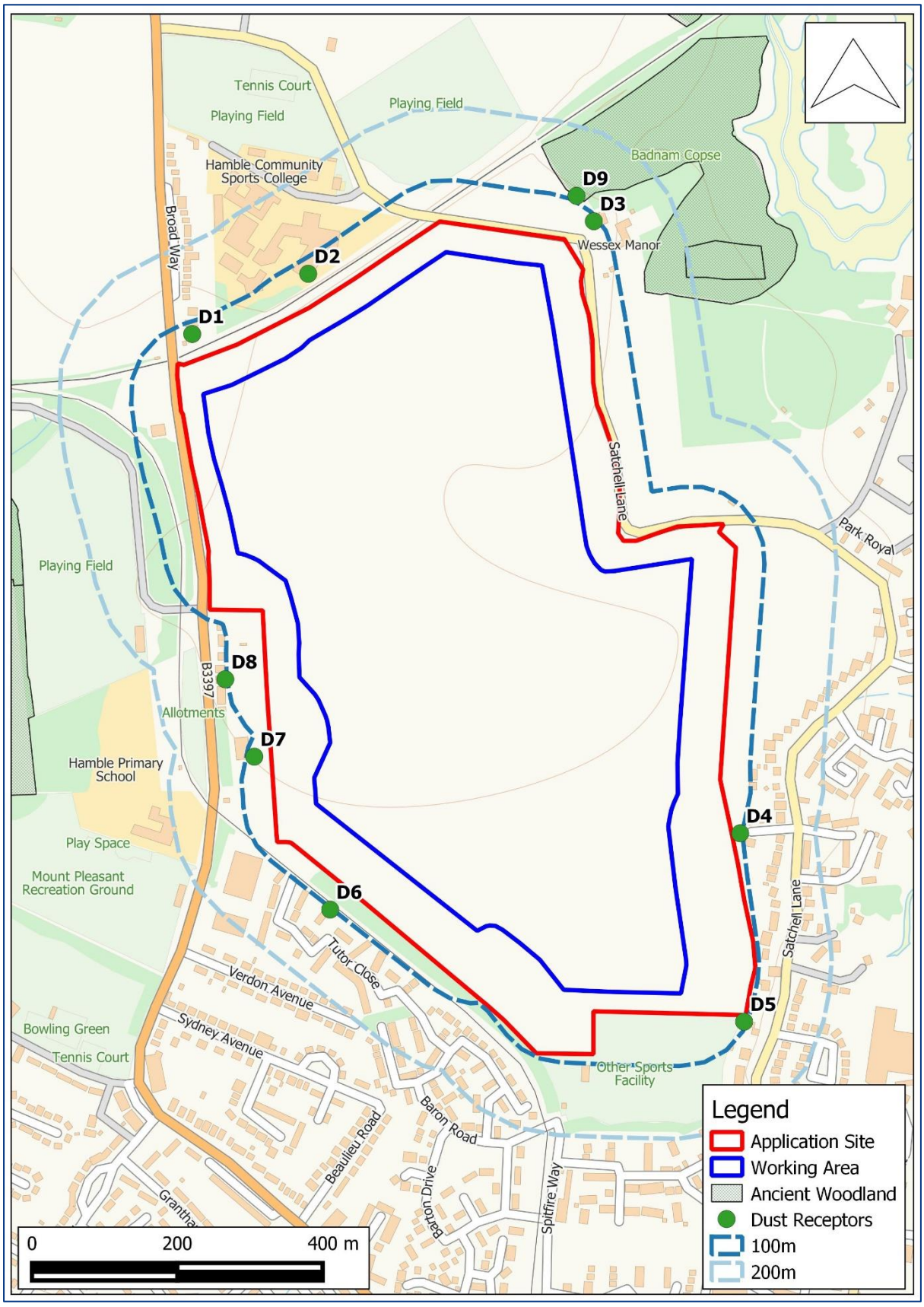

Figure 2: Dust Receptors

Residual Source Emissions

3.2.2 The residual source emissions, i.e., the emissions with designed in mitigation in place, have been estimated for each of the main operational activities.

Site Preparation

3.2.3 The application site area is approximately 60ha, with a working area of approximately 42ha; however, the area would be worked in phases, working anticlockwise following the Phase 1 construction of a freshwater pond, a silt pond and the plant area at the north of the site, as set out in the Method of Working Phasing Overview, submitted with the planning application and reproduced in **Figure 3**. Each working phase would range in size from 3.6 to 7.6ha. Screening bunds, with a height of between 3-5m, will enclose the entire working area. The bunds would be constructed using soils and overburden removed from the Phase 1 areas. The bunds would be seeded immediately on completion. There will be no more than five heavy plant in operation simultaneously during the site preparation works. The top soils and overburden removal could be a source of dust during the construction of the screening bunds; therefore, the residual source emission magnitude during site preparation is considered to be medium.

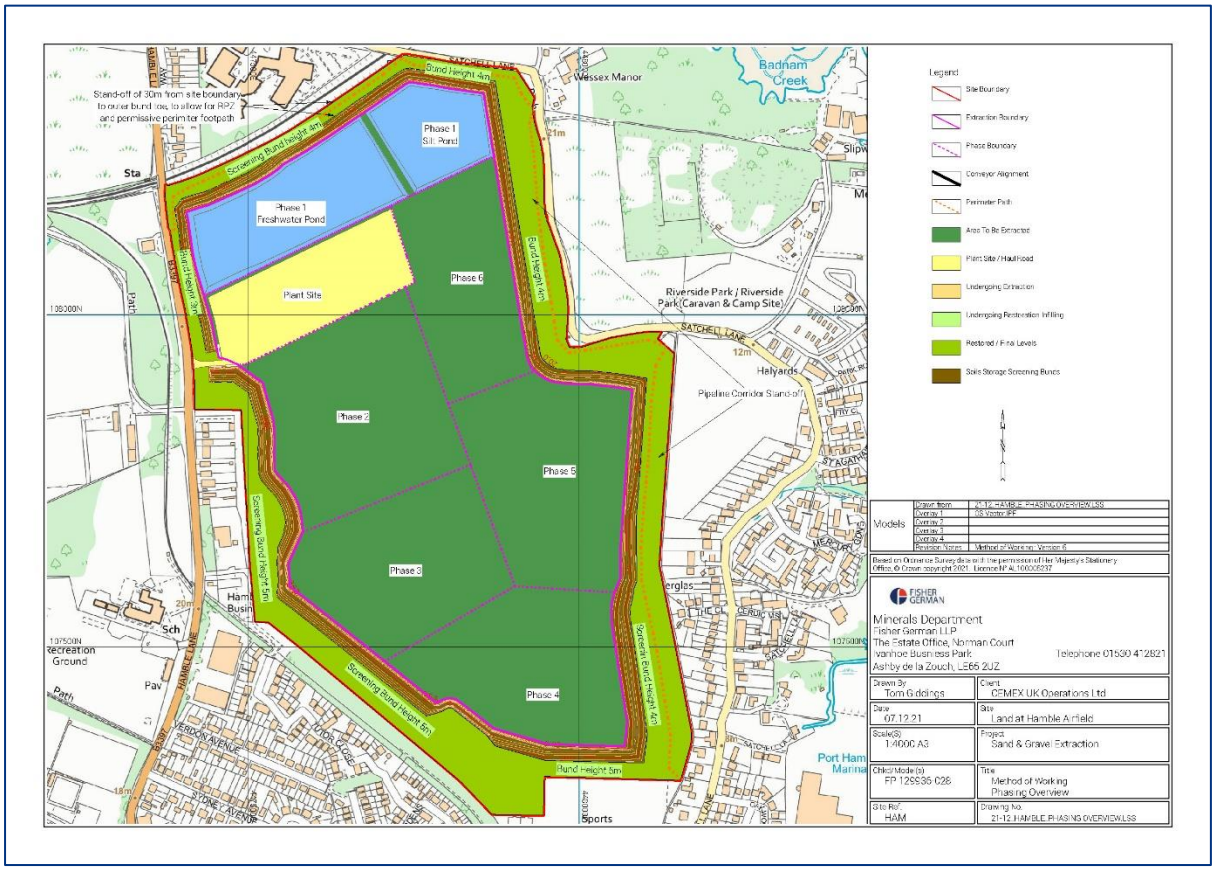

Figure 3: Method of Working Phasing Overview
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Mineral Extraction, Material Handling and On-site Transportation

3.2.4 Sand and gravel would be extracted using a 360° excavator and moved by a wheeled loading shovel onto a field conveyor, which will move the aggregates to the plant area for processing. Each working area would be relatively small (3.6 to 7.6ha), with just one extractor in use at any one time to win the minerals. The minerals would retain a high level of moisture, reducing the likelihood of dust emissions as the minerals are worked.

3.2.5 The mineral extraction works will take place for up to 7 years. Approximately 1.7 million tonnes of sand and gravel would be extracted at an average rate of around 250,000 tonnes/yr. Most of the extraction works would take place more than 100m from dust sensitive receptors and would be screened from the surrounding area by the bunds and retained vegetation.

3.2.6 The use of a field conveyor to transport the minerals from the extraction phase to the plant area would minimise any dust emissions from on-site transportation.

3.2.7 The residual source emission magnitude during mineral extraction, handling and on-site transportation is considered to be small.

Mineral Processing

3.2.8 The processing plant would be located in the plant area, well over 100m from any dust sensitive receptors. The extracted minerals will be screened and washed and sorted into sizes, likely to be 10mm, 20mm and sand fractions. The screening and washing process is wet, which would control any dust emissions.

3.2.9 The residual source emission magnitude during mineral processing is considered to be small.

Stockpiles and Exposed Surfaces

3.2.10 Due to the progressive working of the site, the exposed surface of the void would never be more than 10 ha and the sand and gravel would have a low dust potential due to inherent moisture in the minerals. The working areas are shielded from local receptors by the screening bunds and retained vegetation.

3.2.11 Processed mineral will be moved to stockpiles in the centre of the plant area by loading shovel. The stockpiles would be located more than 100m from any dust sensitive receptors, and water suppression would be used if visible dust emissions were observed from the stockpiles.

3.2.12 The residual source emission magnitude from exposed surfaces and stockpiles is considered to be small.

Site Restoration

3.2.13 The restoration phase will occur concurrently with the ongoing extraction, with approximately 1.8 million tonnes of inert materials imported at a rate of 150,000 tonnes per year while extraction is ongoing, increasing to 250,000 tonnes per year once extraction has ceased. The areas being actively restored would range in size from 3.6 to 7.6ha.

3.2.14 The inert materials for restoration will be inspected on arrival and non-acceptable wastes will be quarantined and then sent off site to an appropriate licensed landfill. A dump truck will carry the infill materials to the working face of the restoration, where a bulldozer will place and compact the infill where required. The vehicle speed on-site will be limited to 10 mph.

3.2.15 When the restoration surface in each phase is considered satisfactory, overburden and soils will be placed. As soon as practicable, following the completion of soil replacement, a seed bed will be prepared to minimise dust emissions.

3.2.16 The bunds and retained vegetation will screen receptors from any dust emissions during the restoration works and dust sensitive receptors would be more than 100m from potentially dust generating activity for most of the restoration phase. As there is a risk of dust emissions during removal of the screening bunds, the residual source emission magnitude during site restoration is considered to be medium.

Off-site Transportation

3.2.17 There would be a maximum of around 72 additional HGV movements out of the application site. All HGVs would be covered prior to leaving the site and would use a wheelwash and travel over more than 50m of clean, hard surface before joining the public highway. The dust controls would ensure that there is minimal trackout from the site; therefore, the residual source emission magnitude for off-site transportation is considered to be small.

Summary of Residual Source Emissions

3.2.18 A summary of the residual source emissions is shown in **Table 11**.

Table 11: Summary of Residual Source Emissions for Each Phase

Activity	Residual Source Emissions
Site Preparation/Restoration	Medium
Mineral Extraction	Small
Materials Handling	Small
On-site Transportation	Small
Mineral Processing	Small
Stockpiles and Exposed Surfaces	Small
Off-site Transportation	Small

Pathway Effectiveness

Meteorology

3.2.19 The transport of fugitive dust in the air is dependent on the prevailing meteorological conditions. Receptors downwind of the dust emissions source, with regard to the prevailing wind, will be exposed to dust more frequently than those located upwind.

The eight-year average wind rose from Southampton Airport meteorological station (see **Figure 4**) shows that the prevailing wind direction is from the southwest. Southampton Airport meteorological station is located approximately 9km to the north-northwest of the site and wind conditions are likely to be similar to those at the site.

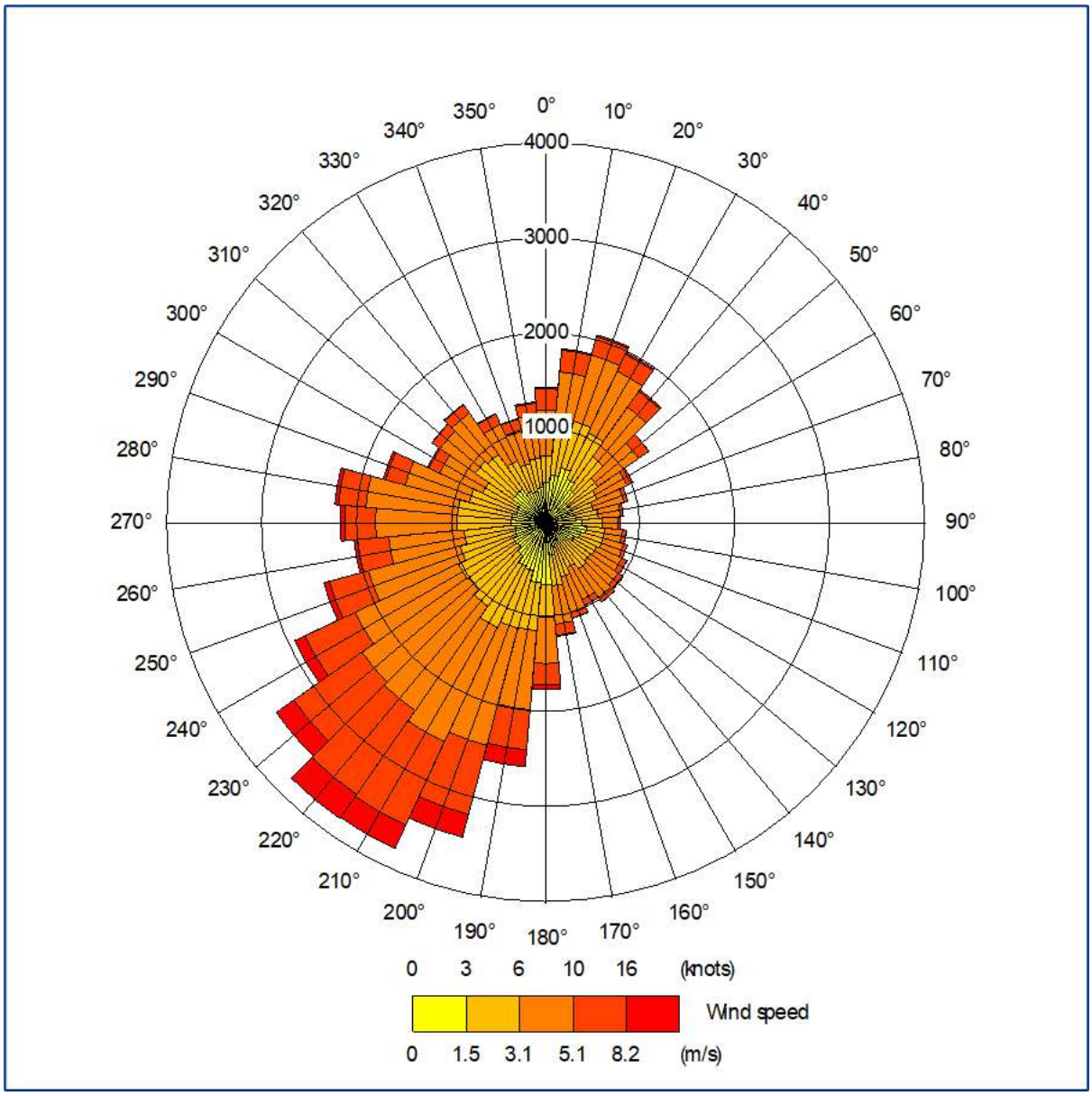

Figure 4: 8 Year Average Wind Rose Southampton Airport (2012-2019)

3.2.20 There is a risk that dust will be entrained from the ground even when no dust generating activities are taking place. Wind speeds greater than 5 m/s are considered strong enough to initiate the suspension of dust from the ground, and the risk is increased on dry days, i.e., when less than 0.2 mm of rainfall are recorded over a 24-hour period. The prevailing wind data show that, for approximately 76% of the time, wind speeds are likely to be below 5 m/s, when dust is unlikely to become suspended in the air.

3.2.21 Analysis of average rainfall data for the area shows that, over the 30-year period from 1991 to 2020, an average of 150-160 days will be wet days, i.e., rainfall will be greater than 0.2 mm (Met Office, 2023). Therefore, for approximately 42% of the time, daily rainfall will be greater than 0.2 mm, when there will be natural dust suppression.

3.2.22 The wind frequency category for each receptor, estimated from the meteorological data and with regard to **Table 7**, is shown in **Table 12**. In order to provide a conservative assessment, it has been assumed that dust could be emitted from any location within the working area.

Table 12: Wind Frequency Category for Each Receptor Area during each Phase

Receptor	Wind Sectors Affecting Receptor Area (°)	Frequency of Wind >5m/s Towards Receptor Area (%)	Frequency of Wind >5m/s Towards Receptor Area on Dry Days (%)	Wind Frequency Category
D1	70-170	1	1	Infrequent
D2	80-220	9	5	Moderately Frequent
D3	180-260	12	6	Moderately Frequent
D4	200-350	14	7	Moderately Frequent
D5	280-350	3	1	Infrequent
D6	340-110	4	2	Infrequent
D7	350-130	4	2	Infrequent
D8	0-140	3	2	Infrequent
D9	180-280	14	7	Moderately Frequent

3.2.23 The potential impact of dust emissions at receptors is dependent on the distance from the source to the receptor and the presence of any physical features that may affect dispersion. Particles responsible for most dust annoyance will usually deposit within 100m of the source and within this distance receptors would be categorised as close. The receptor distance categories for the receptors are described in **Table 13**, with regard to the information in **Table 8**.

3.2.24 Combining the wind frequency category with the receptor distance category using **Table 9** determines the pathway effectiveness for each receptor area, as shown in **Table 13**.

Table 13: Pathway Effectiveness for Each Receptor Area

Receptor Area	Frequency of Potentially Dusty Wind	Receptor Distance Category	Pathway Effectiveness
D1	Infrequent	Close	Ineffective
D2	Moderately Frequent	Close	Moderately Effective
D3	Moderately Frequent	Close	Moderately Effective
D4	Moderately Frequent	Close	Moderately Effective
D5	Infrequent	Close	Ineffective
D6	Infrequent	Intermediate	Ineffective
D7	Infrequent	Close	Ineffective
D8	Infrequent	Intermediate	Ineffective
D9	Moderately Frequent	Intermediate	Moderately Effective

Potential Dust Deposition Effects

3.2.25 The pathway effectiveness for each receptor has been combined with the overall residual source emissions to estimate the dust impact risk at each receptor using **Table 4**. The dust impact risk and receptor sensitivity have then been used to determine the magnitude of the dust effect at each receptor using **Table 5**. The dust deposition effects are described as negligible at all of the receptors, as summarised in **Table 14**.

Table 14: Summary of Dust Deposition Effects

Receptor	Overall Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
D1	Small	Ineffective	Negligible	High	Negligible
D2	Small	Moderately Effective	Negligible	High	Negligible
D3	Small	Moderately Effective	Negligible	High	Negligible
D4	Small	Moderately Effective	Negligible	High	Negligible
D5	Small	Ineffective	Negligible	High	Negligible

Receptor	Overall Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
D6	Small	Ineffective	Negligible	High	Negligible
D7	Small	Ineffective	Negligible	Medium	Negligible
D8	Small	Ineffective	Negligible	High	Negligible
D9	Small	Moderately Effective	Negligible	Medium	Negligible

3.3. Health Effects

Air Quality Objectives

3.3.1 Part IV of The Environment Act 1995 required the UK Government to prepare an Air Quality Strategy which includes standards and objectives for air quality and sets out measures which are to be taken by local authorities and the government in order to achieve those objectives. Standards are the concentrations of pollutants in the atmosphere, below which there is a minimum risk of health effects or ecosystem damage; they are set with regard to scientific and medical evidence. Objectives are the policy targets set by the Government, taking account of economic efficiency, practicability, technical feasibility and timescale, where the standards are expected to be achieved by a certain date.

3.3.2 The objectives for PM_{10}, as prescribed by the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2000; The Stationary Office, 2002), are shown in **Table 15**. The objectives for PM_{10} were to have been achieved by 2004 and continue to apply in all future years thereafter.

Table 15: The Objectives for PM_{10}

Pollutant	Concentration Measured As	Objective
PM_{10}	24-hour Mean	50 µg/m^3 not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3

3.3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Examples of where the objectives should apply are provided in the Local Air Quality Management Technical Guidance (Defra, 2022) issued by the Department for Environment, Food and Rural Affairs (Defra). The annual mean PM_{10} objectives should apply at the building façades of residential properties, schools, hospitals, care homes etc.; they should not apply at the building façades of places of work, hotels, gardens or kerbside sites. The 24-hour mean PM_{10} objective should apply at all locations where the annual mean objective applies, as well as the gardens of residential properties and hotels.

Assessment Criterion

3.3.4 The PM_{10} air quality objectives are used as the threshold for the assessment of health impacts, as established in the national Planning Practice Guidance (nPPG) for Minerals (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, 2014). The nPPG states that:

"Operators should follow the assessment framework for considering the impacts of PM_{10} from a proposed site." [1]

3.3.5 The assessment framework is a site assessment flow chart, reproduced at **Figure 5**[2]. The assessment framework is clear that, where PM_{10} concentrations are not likely to exceed the air quality objectives, good practice measures should be sufficient to control dust emissions, without the need for monitoring and specific controls on PM_{10} emissions.

3.3.6 The assessment criterion for PM_{10} is 32µg/m^3, as measured data show that the 24-hour PM_{10} objective could be exceeded where annual mean concentrations are above 32µg/m^3 (Defra, 2022).

3.3.7 The IAQM approach to screening PM_{10} is intended to prevent the need for unnecessarily detailed consideration of PM_{10} emissions where there will not be an adverse effect. The IAQM approach is that there is little risk that a process contribution from a dust source would lead to an exceedance of the PM_{10} objectives where background ambient PM_{10} concentrations are below 17µg/m^3. The value of 17µg/m^3 is derived by subtracting 15µg/m^3 from the 32µg/m^3 assessment criterion, based on an assumption that the maximum annual mean process contribution from any minerals site is likely to be around 15µg/m^3. The screening criterion is conservative as it is used for screening impacts from all mineral's sites, including those with higher dust emission potential, such as clay quarries and hard rock quarries using blasting. Based on evidence presented in the IAQM mineral dust guidance, the process contribution to PM_{10} concentrations from sand and gravel quarries is likely to be less than 1µg/m^3.

Potential Health Effects

3.3.8 Baseline air quality at receptors that may be affected by dust emissions from the proposed development was determined in the air quality chapter of the ES. The Defra background concentration maps, validated against national monitoring undertaken in 2018, were used to determine background PM_{10} concentrations.

3.3.9 An air quality dispersion model, verified against local monitoring data, was used to determine the contribution to PM_{10} concentrations due to road traffic emissions. The predicted road contribution of PM_{10} emissions was added to the Defra background concentration to provide the baseline air quality at receptors close to roads affected by the proposed development. The highest baseline (background + road emissions) PM_{10} concentration locally, i.e., within 250m of dust emitting activities, has been estimated to be 14.6µg/m^3 in 2019.

[1] Paragraph: 030 Reference ID: 27-030-20140306, Revision date: 06 03 2014
[2] Paragraph: 032 Reference ID: 27-032-20140306, Revision date: 06 03 2014

3.3.10 The Baseline PM_{10} concentration of 14.6µg/m^3 within 250m of dust generating activities is significantly lower than the IAQM screening criterion of 17µg/m^3. There is no risk of exceedances of the PM_{10} air quality objectives due to operations at the site and good practice measures to control dust should be sufficient to control PM_{10} emissions, without the need for PM_{10} monitoring and specific PM_{10} controls.

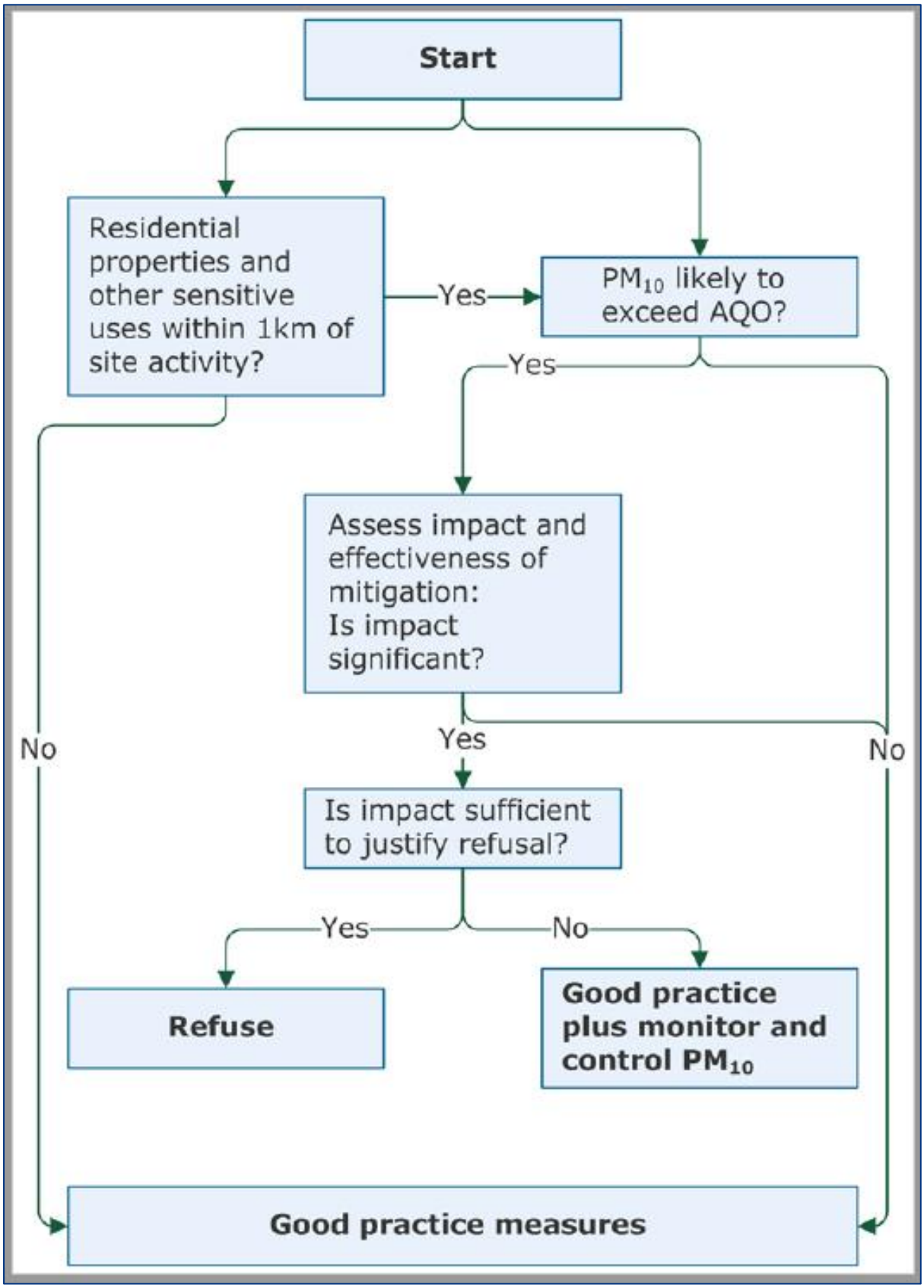

Figure 5: nPPG Minerals PM_{10} Assessment Framework

4 Dust Management and Control

4.1. Dust Controls

4.1.1 The assessment has shown that there is a negligible risk of adverse effects due to dust emissions from the proposed development. The following dust control and mitigation measures will be implemented at the site:

- The existing boundary vegetation will be retained, where practicable;
- Screening bunds will be constructed along the entire perimeter of the working area. The screening bunds will be seeded immediately on completion;
- Movement of soil will not take place during dry periods, when operationally possible;
- Exposed soils will be grass seeded as soon as practicable;
- Won minerals will be transported to the processing area using a field conveyor;
- The processing area and stockpiles will be located more than 100m from any dust sensitive receptors. Stockpiles will be sprayed with water to maintain moisture, if required;
- Drop heights during offloading of infill and placing of the infill materials will be minimised;
- Water suppression will be used as necessary, with particular attention paid during potentially dust generating activities within 100m of receptors;
- The duration and timing of dust generating activities will be restricted when undertaken within 100m of dust sensitive receptors during dry/windy conditions, when operationally possible;
- Additional water suppression will be used during dry weather, with a mobile water bowsers available to take water where needed;
- Hard surfaced areas will be regularly cleaned and the roads dampened as necessary during dry weather;
- Inert material will be subject to visual inspection on arrival. Material not conforming to acceptance procedures will be rejected. Where the site cannot accept a specific material, the load will be redirected to a facility capable of compliantly accepting it;
- Onsite vehicle speeds will be restricted to 10 mph;
- All HDVs leaving the site will be sheeted and will use a wheel wash. The HDVs will travel over more than 50m of hard surfaced road after using the wheel wash before joining the public highway;
- Road sweeping and cleaning plant will be used at the site and on the public highway, as necessary;
- Site manager will ensure effective dust control by monitoring weather conditions during dust sensitive periods, undertaking regular visual dust monitoring and identifying and monitoring the intensity of potential dust generating activities.

4.1.2 The good practice dust mitigation measures outlined above, along with the implementation of this DMP, will ensure that any residual dust effect is negligible.

4.2. Roles and Responsibilities

4.2.1 Cemex are committed to the effective management of dust emissions from the site. Cemex conducts their operations within their Quality and Environmental Management Systems to meet the requirements of ISO 14001:2015 and ISO 9001:2015. The Quality and Environmental Systems includes documents that set out the roles and responsibilities of Cemex's management, including those responsible for identifying environmental risks at the site, and for ensuring that relevant employees and contractors are aware of these risks.

4.2.2 The day-to-day operations at the site are the responsibility of the Quarry Manager. In the Quarry Managers absence, all duties would be undertaken by the Deputy Quarry manager.

4.2.3 All operational staff members are responsible for minimising any dust emissions from the site. When abnormal dust emissions are observed, operators are instructed to report this to the Quarry Manager without delay.

4.2.4 It is the responsibility of the Quarry Manager to organise action to mitigate emissions of fugitive dust.

4.3. Training and Competence

4.3.1 All operational staff at the site will be trained in their responsibilities with regard to dust control at the site. Management will maintain a statement of training requirement for each operational position, and a record will be kept detailing the training received by each operator.

5 Monitoring

5.1. Dust Monitoring

5.1.1 All site personnel will be responsible for reporting dust problems to the Quarry Manager immediately, on an on-going basis.

5.1.2 A daily visual inspection will be carried out by the Quarry Manager, or an appropriately trained operator. The inspection will consist of a walk around the active areas with observations made of any dust emissions detected. Particular attention will be paid to any areas where there is a greater risk of dust emissions. A record of the inspection will be maintained in the site logbook. If significant dust is identified beyond the site boundary, a Dust Event Form should be completed and recorded in the site log book (an example Dust Even Form is provided in **Appendix A1**), and immediate investigation/remedial action will be taken, as outlined in **Section 6**. The Quarry Manager will review Dust Event Forms regularly to ensure that any necessary actions have been implemented, and to identify problem areas where more may need to be done to mitigate against further dust emissions.

5.1.3 Dust deposition to a surface can be measured using a slide or sticky pad to indicate the level of soiling, or the dust deposition mass can be measured by collecting dust in a container over a fixed period, usually a month. The dust flux can also be measured, i.e., the rate of dust travelling through the air.

5.1.4 Dust deposition will be monitored at a suitable location, to be agreed following discussions with relevant stakeholders, with monitoring undertaken prior to operations starting at the quarry in order to determine baseline conditions.

5.1.5 During adverse meteorological conditions, when it is dry and/or windy, additional inspections shall be carried out downwind of any dust generating activities.

5.1.6 The regulator shall be informed if dust emissions are likely to have an effect on the local community.

5.2. Automatic Monitoring

5.2.1 An automatic particulate monitor will be installed at a suitable location to be agreed following discussions with relevant stakeholders. Monitoring will commence prior to any dust generating activities at the site in order to determine baseline conditions. The automatic monitor shall remain in place for as long as necessary to determine whether there are any air quality effects due to operations at the site. The automatic monitor will not be removed without prior agreement from relevant stakeholders

5.3. Weather Monitoring

5.3.1 A meteorological station will be installed with the automatic monitoring site to record real-time wind speed and direction data. The data will be monitored throughout the day by the Quarry Manager and site operates in order to alert staff to potential adverse conditions that may trigger the requirement for the additional mitigation measures outlined in **Section 6**. Meteorological conditions at time of any significant dust emissions beyond the site boundary will be recorded in the Dust Event Form.

5.3.2 The meteorological data will also be used as part of the analysis of the measured data from the automatic monitor.

6 Trigger Levels, Risk Factors and Corrective Action

6.1. Trigger Levels

Visible Dust

6.1.1 A daily inspection of the site will be carried out by the Quarry Manager, or an appropriately trained operator, to make observations on the meteorological conditions and dust emissions (see **Section 5**).

6.1.2 In the event that the following conditions are experienced on site, additional mitigation measures will be employed:

- A complaint regarding dust is made;
- Wind speeds of 5 or above on the Beaufort wind scale, i.e., a fresh breeze (9-11 m/s); and
- Observations of dust due to site operations extending beyond the site boundary.

6.1.3 The additional measures will include:

- Immediate identification of the source of the dust;
- The liberal use of water suppression; and
- Covering or sheeting sources of unacceptable dust emissions (where possible).

6.1.4 In the event that unacceptable dust emissions continue, despite the additional mitigation measures, consideration should be given to modifying site operations, in liaison with the regulator, and temporarily suspending site operations until the issue can be resolved.

6.1.5 The following risk factors have also been identified as occurrences that may arise that will need contingency action in order to prevent dust emissions.

Fine Particulate Matter (PM_{10})

6.1.6 A Site Action Level for PM_{10} concentrations will be set at 190µg/m^3 measured as a 1-hour mean. The Site Action Level is taken from IAQM Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (IAQM, 2018). Although this Site Action Level is for construction sites, it has been established to protect the health of receptors close to dust emitting activities and is appropriate for use at the quarry. An alert system will be implemented where the Quarry Manager is automatically contacted via email, text or an alarm system if the Site Action Level is exceeded.

6.1.7 Measured concentrations in exceedance of the Site Action Level may indicate that best practice, with regard to dust control, is not being implemented. In the event of an exceedance of the Site Action Level, the Quarry Manager will review meteorological data to determine whether the quarry could be the source of dust. In the event of an exceedance of the Site Action Level due to quarry operations, the Quarry Manager will review on-site operations to ensure that best practice mitigation is being applied. Should a continued significant breach of the Site Action Level occur, work will be stopped as soon as is practicable, and the dust emission source identified and remedied prior to the recommencement of work.

6.1.8 Investigation of the monitoring data will be undertaken following an exceedance of the Site Action Level to identify whether it was due to on-site operations, or due to external factors. Repeated breaches may indicate that a review of the AQDMP is necessary.

6.2. Risk Factors

Equipment Failure

6.2.1 Should there be a water supply failure during dry conditions, and dust is observed beyond the site boundary, dust generating activities will cease until the water supply is restored.

6.2.2 If there is a failure of the wheel wash system, lorries will be hosed down manually until the wheel wash system can be repaired.

6.2.3 Regular maintenance checks of the dust control equipment fitted to the processing plant will be undertaken and repaired as necessary. Should the plant dust controls fail, and there is a risk of visible dust beyond the site boundary, the plant should not be used until repaired.

Abnormal Waste

6.2.4 Where a waste load is excessively dusty, it will be wetted to minimise the risk of dust emissions.

6.2.5 Non-acceptable materials will be quarantined and then sent off site to an appropriate licensed landfill.

Adverse Weather

6.2.6 During extreme weather conditions, such as long periods of dry weather and/or high wind speeds, there is a risk that dust may be entrained and dispersed over a greater distance from the site.

6.2.7 During extreme weather, the movement of dry materials will be kept to a minimum. Water suppression will be used liberally in order to prevent dust emissions beyond the site boundary.

6.2.8 Short-term weather forecasts should be used to plan future site operations, and hard standing should be wetted before winds blow towards receptors to prevent dust annoyance.

7 Record Keeping and Auditing

7.1. Complaints Log

7.1.1 A notice will be displayed at the site entrance displaying:

- The name of the site operator;
- An emergency contact name and telephone number;
- The Environmental Permit number(s); and
- A statement that the site is permitted by the Environment Agency and the Environment Agency national number (03708 506 506) and incident hotline (0800 80 70 60).

7.1.2 Should a complaint be made directly to the site, a Site Dust Complaint Form should be completed and recorded in the site logbook and the Quarry Manager informed (an example Site Dust Complaint Form is provided in **Appendix A3**). The dust emission source will be investigated immediately, and remedial action taken. The Quarry Manager will determine appropriate actions to prevent further occurrences.

7.1.3 The Quarry Manager will try to establish what on-site activity was going on at time the complaint was made and review the meteorological conditions at the time of the complaint. The Quarry Manager will then determine appropriate actions to prevent further occurrences.

7.1.4 Records of complaints and investigations will be stored by the Quarry Manager and made available to the regulator to examine on request.

7.2. Communications

7.2.1 Following investigation of the complaint, feedback will be provided to the complainant outlining the findings of the investigation, and the remedial actions taken, as well as apologising and explaining the commitment to prevent further occurrences. A record of the feedback given will be retained in the site logbook.

7.3. DMP Audit

7.3.1 The Quarry Manager will review the DMP once a year, in light of any complaints or issues that have been identified during the previous year. The following issues will be considered during the review:

- Effectiveness of mitigation measures employed;
- Additional mitigation measures implemented within the previous 12 months;
- Complaints received in relation to dust impacts at offsite receptors;
- Review of any dust events recorded within the previous 12 months;
- Review of the effectiveness of the visual monitoring scheme; and
- Review of the effectiveness of personnel training on dust awareness.

7.3.2 Should any control measures be shown to be failing, or should a need for further control measures be identified, new controls will be agreed and implemented in an updated DMP.

8 Conclusion

8.1.1 The dust risk assessment has determined that, with good practice dust controls, there is a negligible risk of dust soiling and PM_{10} health effects due to operations at the site. It is considered that ongoing visual inspection to monitor dust from the site, along with the corrective actions identified in this DMP, are sufficient to ensure there are no impacts due to dust.

9 References

Defra. (2022). *Local Air Quality Management Technical Guidance (TG22).*

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2014). *nPPG Guidance Minerals*. Retrieved 04 18, 2023, from https://www.gov.uk/guidance/minerals

IAQM. (2016). *Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1.*

Met Office. (2023). *UK Climate Averages*. Retrieved from Met Office: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/

The Stationary Office. (2000). *Statutory Instrument 2000, No 921, The Air Quality (England) Regulations 2000.* London.

The Stationary Office. (2002). *Statutory Instrument 2002, No 3043, The Air Quality (England) (Amendment) Regulations 2002.* London.

10 Appendices

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A1 Professional Experience

Bob Thomas, BSc (Hons) PgDip MSc MIEnvSc MIAQM CSci

Bob Thomas is a Director at AQA, with over twenty years working in the sciences and sixteen years' experience in the field of air quality management and assessment. He has carried out air quality and odour assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM_{10}, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial (including odour) sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at http://aqassessments.co.uk/about

A2 Dust Event Form

Dust Event Form	
Form completed by	
Description of event [a]	
Time / Date	
Activities taking place at time of event	
Dust mitigation employed to control event	
Summary of weather conditions at time of event [b]	
Details of corrective actions to prevent repeat of event	
Notes	

[a] e.g. complaint registered (name and address) or visible dust crossing site boundary during visual assessment.
[b] wind speed, wind direction, dry/wet, prolonged spell of dry weather etc.

A3 Dust Complaint Form

Site Dust Complaint Form					
Form completed by		**Signed**		**Date**	
Site manager		**Signed**		**Date**	
Complainant Details					
Name					
Address					
Telephone					
Complaint Details					
Time, date and duration of offending dust					
Location of dust					
Complainants description of dust					
Intensity of dust (light, moderate, strong, persistent)					
Weather conditions at time of dust					
Other comments					
For Completion by Site Manager					
Have any other complaints been made relating to this location					
Have any other complaints been made relating to this dust episode					
On-site activities at time the dust occurred					
Remedial action taken					
Corrective action planned					
Corrective action completed					