

APPENDIX 7.2

Construction Phase Dust Risk Methodology

- 7.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'ⁱ
- 7.2 Construction activities on the Site have been divided into three types to reflect their different potential impacts. These are:
- Earthworks;
 - Construction; and
 - Trackout.
- 7.3 The potential for dust emissions has been assessed for each activity that is likely to take place and considered as three separate dust effects:
- Annoyance due to dust soiling;
 - The risk of health effects due to a significant increase in exposure to PM₁₀; and
 - Harm to ecological receptors.
- 7.4 The assessment steps (in line the aforementioned IAQM guidance) are detailed below.

Step 1

- 7.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to Step 2.
- 7.6 Should sensitive receptors not be present within the relevant distances then negligible effects would be expected and further assessment is not necessary.

Step 2

- 7.7 Step 2 assesses the risk of potential dust effects. The Site has been allocated to a risk category based on two factors:
- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
 - The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

- 7.8 The two factors are combined in Step 2C to determine the risk of dust effects without mitigation applied.
- 7.9 Step 2A defines the potential magnitude of dust emission through the construction phase of the Development. The relevant criteria for the Development (considered to be a Large site) is summarised in Table 7.1 below.

Table 7.1 Construction Dust – Magnitude of Emissions

Magnitude	Activity	Criteria
Large	Earthworks	Total site area greater than 10,000m ² ; Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); More than 10 heavy earth moving vehicles active at any one time; Formation of bunds greater than 8m in height; and More than 100,000 tonnes of material moved.
	Construction	Total building volume greater than 100,000m ³ ; On site concrete batching; and Sandblasting.
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day; Potentially dusty surface material (e.g. high clay content); and Unpaved road length greater than 100m.
Medium	Earthworks	Total site area 2,500m ² to 10,000m ² ; Moderately dusty soil type (e.g. silt); 5 to 10 heavy earth moving vehicles active at any one time; Formation of bunds 4m to 8m in height; and Total material moved 20,000 tonnes to 100,000 tonnes.
	Construction	Total building volume 25,000m ³ to 100,000m ³ ; Potentially dusty construction material (e.g. concrete); and On site concrete batching.
	Earthworks	10 to 50 HDV trips per day; Moderately dusty surface material (e.g. high clay content); and Unpaved road length 50m to 100m.
Small	Earthworks	Total site area less than 2,500m ² ; Soil type with large grain size (e.g. sand); Less than 5 heavy earth moving vehicles active at any one time; Formation of bunds less than 4m in height; Total material moved less than 20,000 tonnes; and Earthworks during wetter months.

Magnitude	Activity	Criteria
	Construction	Total building volume less than 25,000m ³ ; Construction material with low potential for dust release (e.g. metal cladding or timber).
	Earthworks	Less than 10 HDV trips per day; Surface material with low potential for dust release; and Unpaved road length less than 50m.

Step 2B defines the sensitivity of the area around the Development for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table 7.2.

Table 7.2 Examples of Factors Defining Sensitivity of an Area

Magnitude	Examples	
	Human Receptors	Ecological Receptors
High	Users expect of high levels of amenity; High aesthetic or value property; People expected to be present continuously for extended periods of time; Locations where members of the public are exposed over a time period relevant to the AQO for PM ₁₀ e.g. residential properties, hospitals, schools and residential care homes.	Internationally or nationally designated site e.g. Special Area of Conservation.
Medium	Users would expect to enjoy a reasonable level of amenity; Aesthetics or value of their property could be diminished by soiling; and 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 e.g. parks and places of work.	Nationally designated site e.g. Sites of Special Scientific Interest.
Low	Enjoyment of amenity would not reasonably be expected; Property would not be expected to be diminished in appearance; and Transient exposure, where people would only be expected to be present for limited periods, e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads.	Locally designated site e.g. Local Nature Reserve.

7.10 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

7.11 These factors were considered in the undertaking of this assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table 7.3.

Table 7.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Numbers of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

7.12 Table 7.4 outlines the sensitivity of the area to human health impacts.

Table 7.4 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Receptor Concentration	Numbers of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low	
	10 - 100	Low	Low	Low	Low	Low	

Receptor Sensitivity	Annual Mean PM ₁₀ Receptor Concentration	Numbers of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
Medium	Greater than 32µg/m ³	1 - 10	Low	Low	Low	Low	Low
		More than 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	1 - 10	Medium	Low	Low	Low	Low
		More than 10	Medium	Low	Low	Low	Low
	24 - 28µg/m ³	1 - 10	Low	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	1 - 10	Low	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low	Low
Low		More than 1	Low	Low	Low	Low	Low

Table 7.5 outlines the sensitivity of the area to ecological impacts.

Table 7.5 Sensitivity of the Area to Ecological Impacts

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

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table 7.6 outlines the risk category from earthworks and construction activities.

Table 7.6 Dust Risk Category from Earthworks and Construction

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

Table 7.7 outlines the risk category from trackout.

Table 7.7 Dust Risk Category from Trackout

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

Step 3

Step 3 requires the identification of site specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

7.13 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'. This has been described as negligible within this report to provide continuity between assessment terminologies.

7.14 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.