

Appendix 16.2: Assessment Methodology

Construction Phase

The methodology for the construction phase dust assessment is set out in guidance from the Institute of Air Quality Management (IAQM)¹.

Significance Criteria

The IAQM guidance details criteria for assessing the sensitivity of an area to dust soiling and human health effects of PM₁₀, as summarised in Tables 1 to 5 below.

The guidance then goes on to provide significance criteria for the classification of dust soiling and human health effects from demolition, earthworks, construction activities and trackout, as summarised in Tables 6 to 8 below.

Step 1

Step 1 is to screen the requirement for a more detailed assessment. The guidance states that an assessment will normally be required where there are existing sensitive human receptors within 250m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

With regards to ecological receptors, the guidance states that an assessment will normally be required where there are existing receptors within 50m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

Where any of these criteria are met, it is necessary to proceed to Step 2.

Step 2

Step 2 determines the potential risk of dust arising in sufficient quantities to cause annoyance and/or health or ecological impacts. The risk is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;

¹ Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, August 2023

- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of receptors to dust.

The risk of dust impacts is determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based upon the following two factors.

Step 2A assesses the scale and nature of the works which determines the potential dust emission magnitude as small, medium or large. Examples of how the magnitude may be defined are included in Table 1.

Table 1: Determining the Dust Emission Magnitude of Construction Phase Activities			
Activity	Dust Emission Class		
	Large	Medium	Small
Demolition	Total building volume >75,000m ³ ; Potentially dusty construction material (e.g. concrete); On-site crushing and screening; Demolition activities >12m above ground level	Total building volume 12,000-75,000m ³ ; Potentially dusty construction material; Demolition activities 6-12m above ground level	Total building volume <12,000m ³ ; Construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground level, demolition during wetter months
Earthworks	Total site area >110,000m 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 >6m in height.	Total site area 18,000-110,000m ² ; Moderately dusty soil type (e.g. silt); 5-10 heavy earth moving vehicles active at any one time; Formation of bunds 3-6m in height.	Total site area <18,000m ² ; Soil type with large grain size (e.g. sand); <5 heavy earth moving vehicles active at any one time; Formation of bunds <4m in height; Total material moved <20,000 tonnes.
Construction	Total building volume >75,000m ³ ; On-site concrete batching; Sandblasting	Total building volume 12,000-75,000m ³ ; Potentially dusty construction material (e.g. concrete); On-site concrete batching	Total building volume <12,000m ³ ; Construction material with a low potential for dust release (e.g. metal cladding or timber)

Table 1: Determining the Dust Emission Magnitude of Construction Phase Activities			
Activity	Dust Emission Class		
	Large	Medium	Small
Trackout	>50 HDV (>3.5t) outward movements ^a in any one day ^b ; Potentially dusty surface material (e.g. high clay content); Unpaved road length >100m	10-50 HDV (>3,5t) outward movements ^a in any one day ^b ; Moderately dusty surface material (e.g. high clay content); Unpaved road length 50-100m	<10 HDV (>3.5t) outward movements ^a in any one day ^b ; Surface material with low potential for dust release; Unpaved road length <50m
<p><i>a. A vehicle movement is a one way journey i.e. from A to B, and excludes the return journey</i></p> <p><i>b. HDV movements during a construction project may vary over its lifetime, and the number of movements is the maximum not the average</i></p>			

Step 2B considers the sensitivity of the area to dust impacts which is defined as low, medium or high. The sensitivity categories for different types of receptors are described in Table 2. Based on the sensitivity of individual receptors, the overall sensitivity of the area to dust soiling, human health and ecological effects is then determined using the criteria detailed in Tables 3 to 5, respectively.

Table 2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects			
Sensitivity Category	Dust Soiling Effects	Health effects of PM ₁₀	Ecological Effects
High	Users can reasonably expect to enjoy a high level of amenity; Appearance, aesthetics or value of a property would be diminished; Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car show rooms	Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM ₁₀ ; Examples include residential properties, hospitals, schools, and residential care homes	Locations with an international or national designation and the designated features may be affected by dust soiling; Locations where there is a community of a particularly dust sensitive species; Examples include a Special Area of Conservation with dust sensitive features
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;	Locations where people are exposed as workers and exposure is over a period of time relevant to the air quality objective for PM ₁₀ ; Examples include office and	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; Locations with a national

Sensitivity Category	Dust Soiling Effects	Health effects of PM ₁₀	Ecological Effects
	The appearance, aesthetics or value of their property could be diminished; People or property wouldn't reasonably be expected to be continuously present or regularly for extended periods of time; Examples include parks and places of work	shop workers but will generally not include workers occupationally exposed to PM ₁₀	designation where the features may be affected by dust deposition; Examples include a Site of Special Scientific Interest with dust sensitive features
Low	Enjoyment of amenity would not reasonably be expected; Property would not be diminished in appearance, aesthetics or value; People or property would be expected to be present only for limited periods of time; Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads	Locations where human exposure is transient; Examples include public footpaths, playing fields, parks and shopping streets	Locations with a local designation where the features may be affected by dust deposition; Examples include a Local Nature Reserve with dust sensitive features

Receptor Sensitivity	Number of Receptors	Distance from Source (m) ^c			
		<20m	<50m	<100m	<350m
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

a. The sensitivity to the area should be derived for each of the four activities

b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered

c. For trackout, distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur for up to 500m from large sites, 200m from medium sites and 50m from small sites, measured from the site exit. The impact declines with distance from the site and it is only necessary to consider trackout impacts up to 50m from the edge of the road

Table 4: Sensitivity of the Area to Human Health Impacts^{ab}

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration ^c	Number of Receptors ^d	Distance from Source (m) ^e				
			<20m	<50m	<100m	<200m	<350m
High	>32µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

- a. The sensitivity to the area should be derived for each of the four activities
- b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered
- c. Most straightforwardly taken from the national background maps but should also take account of local sources. The values are based on 32µg/m³ being the annual mean concentration at which an exceedance of the 24-hour mean objective is likely in England, Wales and Northern Ireland. In Scotland, there is an annual mean objective of 18µg/m³
- d. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties
- e. For trackout, distances should be measured from the side of the roads used by construction traffic

Table 5: Sensitivity of the Area to Ecological Impacts ^{abc}		
Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

a. The sensitivity to the area should be derived for each of the four activities outlined below.
 b. Only the highest level of sensitivity from the table needs to be considered
 c. For trackout, distances should be measured from the side of the roads used by construction traffic

These two factors are combined in **Step 2C** to determine the risk of dust impacts with no mitigation applied.

The risk of dust effects is determined for four types of construction phase activities, with each activity being considered separately. If a construction phase activity is not taking place on the site, then it does not need to be assessed. The four types of activities to be considered are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The risk of dust being generated by demolition activities at the site is determined using the criteria in Table 6.

Table 6: Risk of Dust Impacts for Demolition			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

The risk of dust being generated by earthworks and construction at the site is determined using the criteria in Table 7.

Table 7: Risk of Dust Impacts for Earthworks and Construction			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

The risk of dust being generated by trackout at the site is determined using the criteria in Table 8.

Table 8: Risk of Dust Impacts for Trackout			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3

Step 3 of the assessment determines the site-specific mitigation required for each of the activities, based on the risk determined in Step 2. Mitigation measures are detailed in guidance published by the Greater London Authority², recommended for use outside the capital by LAQM guidance, and the IAQM guidance document itself. Professional judgement should be used to determine the type and scale of mitigation measures required.

If the risk is classed as negligible, no mitigation measures beyond those required by legislation will be necessary.

Step 4

Step 4 assesses the residual effect, with mitigation measures in place, to determine whether or not these are significant.

Professional Judgement

The IAQM guidance makes reference to the use of professional judgement when assessing the risks of dust and PM₁₀ from demolition and construction sites.

² Greater London Authority, The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, 2006

Operational Phase

Assessing the Impact of a Proposed Development on Human Health

Guidance has been prepared by Environmental Protection UK (EPUK) and the IAQM³ with relation to the assessment of the air quality impacts of proposed developments and their significance.

The impact of a development is usually assessed at specific receptors and takes into account both the long-term background concentrations, in relation to the relevant Air Quality Assessment Level (AQAL) at these receptors, and the change with the development in place.

The impact descriptors for individual receptors are detailed in Table 16.9.

Table 16.9: Impact Descriptors for Individual Receptors				
Long Term Average Concentration at Receptor in Assessment Year*	Percentage Change in Concentration Relative to Air Quality Assessment Level (AQAL)*			
	1%	2-5%	6-10%	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

**Percentage pollutant concentrations have been rounded to whole numbers, to make it easier to assess the impact. Changes of 0% (i.e. less than 0.5% or 0.2µg/m³) should be described as Negligible*

Determining the Significance of Effects

Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as either ‘significant’ or ‘not significant’.

Once the impact of the proposed development has been assessed for the individual impacts, the overall significance is determined using professional judgement. This takes into account a number of factors such as:

- The existing and future air quality in the absence of the development;
- The extent of the current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

³ Environmental Protection UK and Institute of Air Quality Management, Land-Use Planning and Development Control: Planning for Air Quality, January 2017

Ecological Receptors

The Guidance published by Natural England (NE)⁴ provides advice on the assessment of road traffic emissions on sensitive designated habitat sites with international and/or European designations, i.e SAC (SCI or cSAC), SPA, pSPA and Ramsar sites. The screening criteria follow the superseded Design Manual for Roads and Bridges (DMRB) guidance, requiring that sites which are located within 200m of an 'affected' road, need to be considered.

Roads are deemed 'affected' if a proposed development leads to:

- A change in road alignment of 5m or more;
- A change in daily traffic flow of 1,000 AADT or more;
- A change in HGV flow of 200 AADT or more;
- A change in daily average speed of 10 kph or more; and
- A change in peak hour speed of 20kph or more.

⁴ Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitat's Regulations (June 2018)