

Appendix 12.1 Construction Phase Methodology



Appendix 12.1

CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

There is the potential for fugitive dust emissions to occur as a result of construction activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management's "Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)", 2024.

Construction Phase Assessment

Activities on the construction site have been divided into four types to reflect their different potential impacts. These are:

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

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM₁₀; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects.

The assessment steps are detailed below.

STEP 1

STEP 1 screens the requirement for a more detailed assessment. An assessment will normally be required where there is:

- a 'human receptor' within:
 - 250 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- an 'ecological receptor' within:
 - 50 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

STEP 2

STEP 2 assesses the risk of potential dust impacts separately for demolition, earthworks, construction and trackout activities. Each activity is 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).

The two factors are combined in STEP 2C to determine the risk of dust impacts without mitigation applied.

STEP 2A defines the potential magnitude of dust emission through the demolition phase. The relevant criteria are summarised in Table A12.1.

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume >75,000 m³, • Potentially dusty construction material (e.g. Concrete), • On-site crushing and screening, • Demolition activities >12 m above ground level
	Earthworks	• Total site area >110,000 m², • 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 >6 m in height
	Construction	• Total building volume >75,000m³, • On site concrete batching, • Sandblasting.
	Trackout	• > 50 (>3.5t) outward movements in any one day, • Potentially dusty surface material (e.g. High clay content), • Unpaved road length >100 m.
Medium	Demolition	• Total building volume 12,000 m³ – 75,000 m³, • Potentially dusty construction material, • Demolition activities 6-12 m above ground level
	Earthworks	• Total site area 18,000 m² – 110,000 m², • Moderately dusty soil type (e.g. Silt), • 5-10 heavy earth moving vehicles active at any one time, • Formation of bunds 3 m – 6 m in height
	Construction	• Total building volume 12,000 m³ – 75,000 m³, • Potentially dusty construction material (e.g. Concrete), • On-site concrete batching.
	Trackout	• 20 – 50 (>3.5t) outward movements in any one day, • Moderately dusty surface material (e.g. High clay content) • Unpaved road length 50 m – 100 m.
Small	Demolition	• Total volume of building to be demolished <12,000 m³, • Construction material with low potential for dust release (e.g metal, cladding, or timber), • Demolition activities <6 m above ground, • Demolition during wetter months.
	Earthworks	• Total site area < 18,000m², • Soil type with large grain size (e.g. Sand), • <5 heavy earth moving vehicles active at any one time, • Formation of bunds <3 m in height.
	Construction	• Total building volume <12,000 m³, • Construction material with low potential for dust release (e.g. Metal cladding or timber).

Magnitude	Activity	Criteria
	Trackout	• < 20 HDV (>3.5t) outward movements in any one day, • Surface material with low potential for dust release, • Unpaved road length <50 m.

Table A12.1: Potential Dust Emission Magnitude

Step 2B defines the sensitivity of the area. The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Sensitivity	Examples		
	Dust Soiling Effects	Health Effects of PM ₁₀	Ecological Effects
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 to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).^c • Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• 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, such as vascular species included in the red data list for Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• Users would expect^a 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. • Indicative examples include parks and places of work.	• Locations where the people exposed are workers^d, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to pm10, as protection is covered by health and safety at work legislation.	• 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. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity	Examples		
	Dust Soiling Effects	Health Effects of PM ₁₀	Ecological Effects
Low	• The enjoyment of amenity would not reasonably be expected^a; 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^a to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks^b and roads.	• Locations where human exposure is transient.^e • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local nature reserve with dust sensitive features.

NOTES:

- People's expectations will vary depending on the existing dust deposition in the area.
- Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with a workplace or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.
- This follows Defra guidance as set out in LAQM.TG(22).
- The air quality objectives and limit values do not apply to people in the workplace, although, such people can be affected by exposure of PM₁₀. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers.
- There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

Ecological Receptors: The advice of an ecologist should be sought to determine the need for an assessment of dust impacts on sensitive habitats and plants. A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e. Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

Table A12.2: Sensitivity of Different Types of Receptors

The guidance also provides the following additional factors to consider when determining the sensitivity of an area:

- 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 the 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 this document.

The sensitivity of the area to dust soiling effects on people and property is shown in Table A12.3.

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		> 20	> 50	> 100	> 350
High	> 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A12.3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Table A12.4 outlines the sensitivity of the area to human health impacts.

Receptor Sensitivity	Annual Mean P ₁₀ M Concentration	Number of Receptors	Distance from the Source (m)			
			> 20	> 50	> 100	> 250
High	>32 µg/m ³ (>18 µg/m ³ in Scotland)	>100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 – 32 µg/m ³ (16 – 18 µg/m ³ in Scotland)	>100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
High	24 – 28 µg/m ³ (14 – 16 µg/m ³ in Scotland)	>100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	<24 µg/m ³ (>18 µg/m ³ in Scotland)	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean P ₁₀ M Concentration	Number of Receptors	Distance from the Source (m)			
			> 20	> 50	> 100	> 250
Medium	>32 µg/m ³ (>18 µg/m ³ in Scotland)	1 - 10	Low	Low	Low	Low
		>10	High	Medium	Low	Low
	28 – 32 µg/m ³ (16 – 18 µg/m ³ in Scotland)	1 - 10	Medium	Low	Low	Low
		>10	Medium	Low	Low	Low
	24 – 28 µg/m ³ (14 – 16 µg/m ³ in Scotland)	1 - 10	Low	Low	Low	Low
		>10	Low	Low	Low	Low
	<24 µg/m ³ (>18 µg/m ³ in Scotland)	1 - 10	Low	Low	Low	Low
		>10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table A12.4: Sensitivity of the Area to Human Health Impacts

Table A12.5 outlines the sensitivity of the area to ecological impacts.

Receptor Sensitivity	Distance from the Source (m)	
	> 20	> 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table A12.5: Sensitivity of the Area to Ecological Impacts

STEP 2C combines the dust emission magnitude (STEP 2A) with the sensitivity of the area (STEP 2B) to determine the risk of unmitigated impacts. Tables B6 to B9 provide a method of assigning the level of risk for each activity. This is used to determine the level of mitigation that must be applied. Where the risk category is 'negligible', no mitigation measures beyond those required by legislation will be required.

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

Table A12.6: Risk of Dust Impacts from Demolition

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

Table A12.7: Risk of Dust Impacts from Earthworks

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

Table A12.8: Risk of Dust Impacts from Construction

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

Table A12.9: Risk of Dust Impacts from Trackout

STEP 3

The dust risk categories for each of the four activities determined in STEP 2C should be used to define the appropriate, site-specific, mitigation measures to be adopted. For those mitigation measures that are general, the highest risk category should be applied.

For those cases where the risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required, however, additional mitigation measures may be applied as part of good practice.

Where a local authority has issued guidance on measures to be adopted at demolition/ construction sites, these should also be taken into account.

STEP 4

Once the appropriate dust mitigation measures have been identified in STEP 3, the final step is to determine whether there are significant effects arising from the construction phase of a proposed development.

For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that the conclusion of no significant effect is robust.