Appendix 8.2 Construction Dust Risk Assessment

Introduction

Assessment of construction dust impacts have been scoped out of the ES. However, a construction dust risk assessment has been carried out in order to determine the mitigation measures that should be applied in order to ensure that residual effects arising from construction dust are negligible.

The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. The reason for this is that for almost all construction activities, the application of effective mitigation should prevent any Significant effects from occurring to existing sensitive receptors, and therefore the residual effect will likely be Negligible.

Predicting the impacts due to construction dust is difficult as it is dependent on a number of factors, particularly the weather during specific works. This cannot be predicted, and therefore the assessment methodology uses a risk-based approach to identify appropriate mitigation measures. The assessment, whilst adopting some conservative assumptions, assumes that the mitigation measures will be fully implemented. It should be noted that there may be periods where there is visible dust, but this is likely to be infrequent and insufficient to negatively impact on amenity.

1. Methodology

1.1. Methodology for determining impact magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large.

Demolition: Example definitions for demolition are:

- Large: Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level;
- Medium: Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- Small: Total building volume <12,000 m^3 construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities.

Earthworks: Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Example definitions for earthworks are:

- Large: Total site area >110,000 m^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 >6 m in height;
- Medium: Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height; and
- Small: Total site area <18,000 m^2, 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: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s) / infrastructure, method of construction, construction materials, and duration of build. Example definitions for construction are:

- Large: Total building volume >75, 000 m^3, on site concrete batching, sandblasting;
- Medium: Total building volume 12,000 m^3– 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. Example definitions for trackout are:

- Large: >50 HDV (>3.5t) outward movements[1] in any one day[2,] potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;
- Medium: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and
- Small: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.
- These numbers are for vehicles that leave the Site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

1.2. Methodology for determining sensitivity

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 PM_{10}, 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.

Examples of sensitivities of various receptors to dust soiling, elevated PM_{10} and ecological effects are shown in Table 8.1.

For the sensitivity of people and their property to soiling, the IAQM recommends that the air quality practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the general principles in the table below.

For the sensitivity of people to the health effects of PM_{10}, the IAQM recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to

[1] A vehicle movement is a one way journey. i.e. from A to B, and excludes the return journey.

[2] HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

be exposed to elevated concentrations over a 24-hour period, consistent with the Defra's advice for local air quality management.

With regards to ecological effects, it is advised to seek the advice of an ecologist to determine the need for an assessment of dust impacts on sensitive habitats and plants. Professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. Consequently, specialist ecological advice should also be sought to determine the sensitivity of the ecological receptors to dust impacts. In general, most receptors will either be of high sensitivity or low sensitivity i.e. either sensitive or not to dust deposition.

Table 8.1 Examples of receptor sensitivities for various construction effects.

Receptor sensitivity	Effects Assessing the risk of dust impacts	Assessing the risk of dust impacts	Assessing the risk of dust impacts
High	Users can reasonably expect a enjoyment of a high level of amenity. 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, museum 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). 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 location where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. An indicative example is a Special Area of Conservation (SAC) designated for acid heathlands adjacent to the demolition of a large site containing concrete (alkali) buildings or for the presence of lichen.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality	Locations where there is a particularly important plant species, where its

Receptor sensitivity	Effects Assessing the risk of dust impacts	Assessing the risk of dust impacts	Assessing the risk of dust impacts
	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.	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 may 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.	dust sensitivity is uncertain or unknown; or Locations with a national designation where the features may be affected by dust deposition. Indicative examples include a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected; or there is property that 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. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	Locations where human exposure is transient. Indicative examples 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.

Additional factors to consider when determining the sensitivity of the area include the following:

- 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 are considered go beyond the classifications given.

The following tables show how the sensitivity of an area can be determined for the various potential impacts. For each potential impact the highest level of sensitivity should be recorded.

Table 8.2 Sensitivity of the area to dust soiling effects on people and property

Receptor sensitivity	Number of receptors	Distance from the source (m)			
		<20	<50	<100	<250
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 8.3 Sensitivity of the area to human health impacts

Receptor sensitivity	Annual mean PM_{10} concentration	Number of receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m3 (>18 µg/m3 in	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low

Receptor sensitivity	Annual mean PM_{10} concentration	Number of receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
	Scotland)	1-10	High	Medium	Low	Low	Low
	28-32 µg/m3 (16-18 µg/m3 in Scotland)	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m3 (14-16 µg/m3 in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m3 (<14 µg/m3 in Scotland)	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m3 (>18 µg/m3 in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m3 (16-18 µg/m3 in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m3 (14-16 µg/m3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m3 (<14 µg/m3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 8.4 Sensitivity of the area to ecological impacts

Receptor sensitivity	Distance from the source (m)	
	<20	<50
High	High	Medium

Receptor sensitivity	Distance from the source (m) <20	<50
Medium	Medium	Low
Low	Low	Low

1.3. Defining the risk of impacts

Dust emission magnitude determined at step A) should be combined with the sensitivity of the area determined at step B) in order to determine the risk of impacts with no mitigation applied. The following matrices provide a method of assigning the level of risk for each activity. For those cases where the risk category is 'negligible', no mitigation measures beyond those required by legislation will be required.

Table 8.5 Risk of dust impacts – 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

Table 8.6 Risk of dust impacts – earthworks

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

Table 8.7 Risk of dust impacts – 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

Table 8.8 Risk of dust impacts – trackout

Sensitivity of area	Dust emission magnitude Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Negligible
Low	Low risk	Low risk	Negligible

1.4. Cumulative impacts

Cumulative effects were considered within the construction dust assessment for any cumulative schemes that may be adversely impacted due to the construction of the Proposed Development. Furthermore, cumulative effects at existing receptors that have the potential to be impacted by the Proposed Development and cumulative schemes have been considered.

A number of cumulative schemes can potentially be impacted by construction activities as they are sensitive use and are in close proximity to the Site. Receptors at the worst-case scenario locations of the impacted cumulative schemes are considered in the assessment.

Table 8.9 Cumulative schemes that can potentially be impacted by the construction of the Proposed Development.

Planning reference	Address	Distance from the Site
London Road 125712/FO/2019 (Refreshed scheme of 116099/FO/2017)	Former London Road Fire Station London Road Manchester M1 2PH	173m
IQ Echo Street 136874/FO/2023	Echo Street Manchester M1 3QJ	45m

1.5. Construction Dust Risk Assessment

1.5.1. Step 1: Screen the need for a detailed assessment

In accordance with screening criteria in the IAQM guidance, an assessment is required as there are sensitive human or ecological receptors in proximity to the Site. For human receptors within 250 meters of the Proposed Development, there are homes to the south of the Site, places of work to the south and southeast of the Site, and carparks to the east of the Site. Cumulative schemes will introduce offices to the east of the Site. Therefore, the screening indicates the need for a construction dust assessment.

There is no designated ecological site in the vicinity of the Site, hence ecological impacts are screened out for detailed construction dust assessment.

1.5.2. Step 2A: Define the potential dust emission magnitude

Dust emission magnitudes for construction activities and relevant justification are summarised in Table 8.10.

Table 8.10 Dust emission magnitudes and justifications

Activity	Dust emission magnitude	Justification
Demolition	Medium	The planned building demolition volume falls within the medium impact range (12,000 m^3 – 75,000 m^3) stated in the IAQM guidance. Demolition activities will occur at a height of >12 m above ground level. As such dust emission magnitude for demolition is deemed to be Medium
Earthworks	Medium	The total site area is 2~~0,567~~ 1,733m^2, within the criteria for medium earthwork emission magnitude (18,000m^2 to 110,000m^2). The subsoil is variable clay, silt and gravel, with light, medium and heavy textures present[3]. Taking this into consideration, the dust emission magnitude is deemed to be Medium.
Construction	Large	The total construction volume will exceed the IAQM threshold for Large dust emission

[3] UK Soil Observatory. (2024). UKSO Map Viewer. https://mapapps2.bgs.ac.uk/ukso/home.html

Activity	Dust emission magnitude	Justification
		magnitude (> 75,000 m^3) for the majority of the construction phase.
Trackout	Medium	The current number of HDV movements is currently unknown, however it is considered that there would be between 20-50 HDV outward movements per day. The soil type is variable with clay, silt and gravel[3]. Therefore, both small (with higher dust potential) and large (with lower dust potential) soil particles are present. Overall the emission magnitude is deemed to be Medium.

1.5.3. Step 2B: Define the sensitivity of the area

Figure 8.1 presents an overview of identified construction dust receptors within 100 m of the Site boundary and 50 m of the trackout route from up to 200 m from the Site entrance.

In determining the area sensitivity, the following has been considered:

- Sensitive receptors (more than 100) within 100m to the Proposed Development to the north site are a mix of educational residential or places of work. South of the Mancunian Way and to the Site, there further residential receptors (more than 100).
- There is no designated ecological site within 2 km from the Site.
- Background PM_{10} level in the existing baseline year (2023) at the Site is 15.1 µg/m^3.

Considering the number and sensitivity of receptors, the sensitivity of the surrounding area to potential construction impacts is presented in Table 8.11, which is in line with the IAQM criteria.

Table 8.11 Area sensitivity to human health

Potential impact	Sensitivity of surrounding			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	High	High	High	Medium
Human health	Low	Low	Low	Low

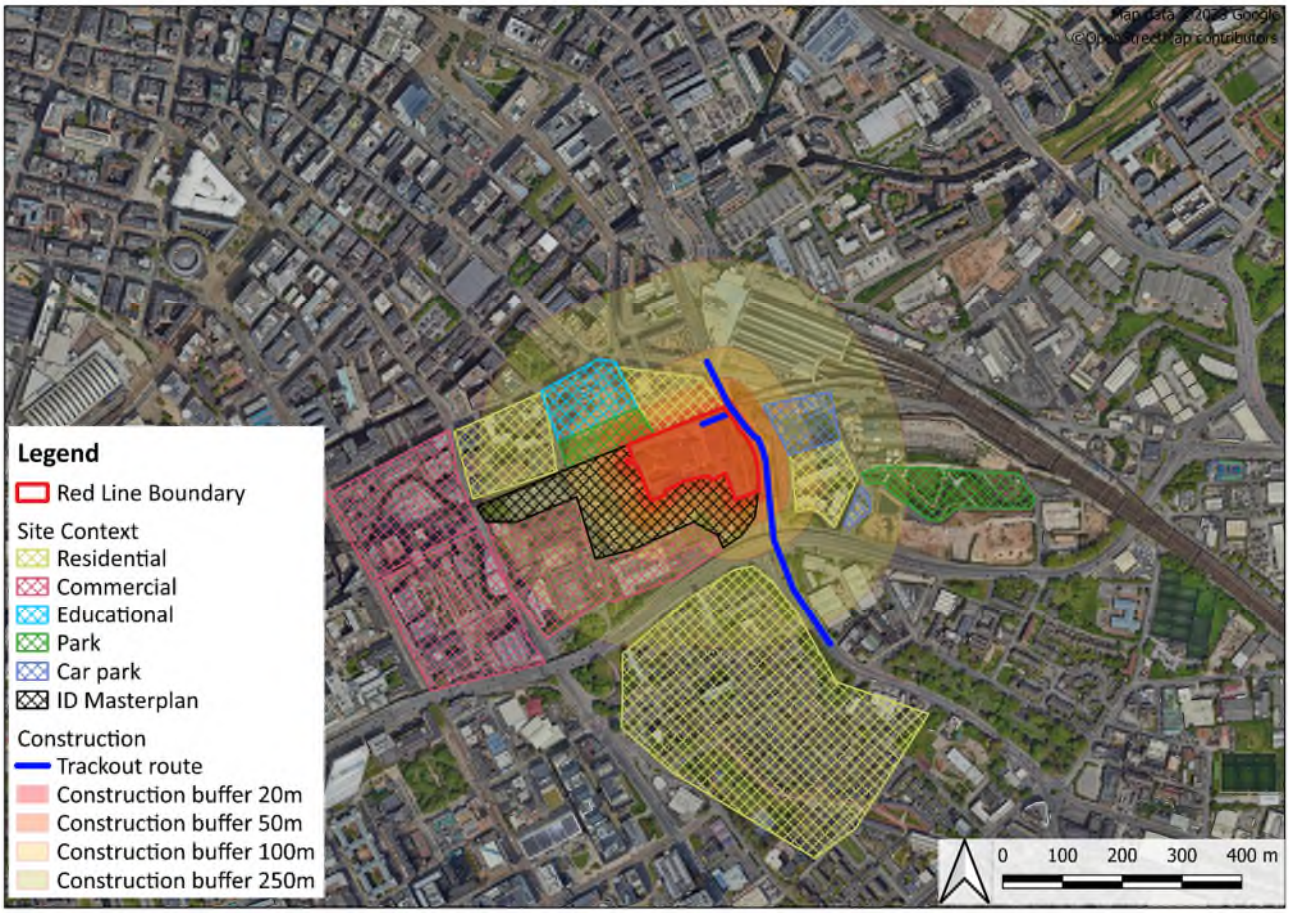

Figure 8.1 Land use of area within 20, 50, 100m from the construction site and 50m from the trackout route.

1.5.4. Step 2C: Define the risks of impacts

The risks of dust impacts for relevant construction activities are summarised in Table 8.12. These results consider both the potential dust emission magnitude and the sensitivity of the area.

It should be noted that activities on-site will be temporary in nature, and mitigation appropriate to the level of risk and in line with good industry practices will be implemented across the Proposed Development to ensure any adverse effects are minimized. The mitigation measures to be applied are presented below.

Table 8.12 Risk of dust soiling and human health impacts associated with construction activities.

Potential impact	Risk associated with construction activities			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	High Risk	Medium Risk	High Risk	Medium Risk
Human health	Low Risk	Low Risk	Low Risk	Low Risk

As the Site is categorized as a high risk the following mitigation measures in Table 8.13 are highly recommended to be incorporated within a construction environment management plant (CEMP):

Table 8.13 Dust emission magnitudes and justifications

Activity	Mitigation Measures
Communication	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the Local Authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.

Activity	Mitigation Measures
	Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling check of surfaces such as street furniture, cars, window sills within 100 m of the site boundary, with cleaning to be provided if necessary.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible, commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences.
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used cover as described below.

Activity	Mitigation Measures
	Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicles/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the Local Authority, where applicable).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimize drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Waste Management	Avoid bonfires and burning of waste materials.
Demolition	Soft strip inside building before demolition.
	Ensure effective water suppression is used during demolition activities. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.

Activity	Mitigation Measures
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
	Only remove the cover in small areas during work and not all at once.
Construction	Avoid scrabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.

Activity	Mitigation Measures
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10 m from receptors where possible.
	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.