



Bellway Homes (East Midlands) Ltd

Air Quality Management Plan

Derby Road, Hilton, Derby

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1 INTRODUCTION

1.1 Background

RSK Environment Limited (RSK) was commissioned by Bellway Homes (East Midlands) Ltd ("the Client") to prepare an Air Quality Management Plan (AQMP) for enabling works at Derby Road, Hilton, Derbyshire. The approximate grid reference of the proposed development site is 424816, 330894. A site plan is presented in Figure 1.1.

The site is within the jurisdiction of South Derbyshire District Council (SDDC). There are no Air Quality management Areas (AQMAs) in close vicinity of the site.

Figure 1.1: Proposed Site Layout Plan



1.2 Purpose and Scope

This AQMP is being prepared as best practice to assess and reduce the risk of dust from the site causing disamenity and particulate matter emissions impacting on air quality in the adjacent area and to determine any appropriate dust/particulate monitoring strategy.

2 LEGISLATION AND POLICY CONTEXT

2.1 Regulation of Ambient Air Quality

Dust and air quality may be material considerations in land use planning under the Town and Country Planning Act 1990 and the Planning and Compulsory Purchase Act 2004, which set out the regulatory framework within which local planning authorities should operate, including the National Planning Policy framework (NPPF).

The ambient air quality standards (AQSS) in the United Kingdom are derived from European Commission (EC) directives and are adopted into English law via the Air Quality (England) Regulations 2000 and Air Quality (England) Amendment Regulations 2002. The Air Quality Limit Values Regulations 2003 and subsequent amendments implement the EU Air Quality Framework Directive into English Law. Directive 2008/50/EC was translated into UK law in 2010 via the Air Quality Standards Regulations 2010.

The relevant¹ Air Quality Objectives (AQOs) and AQSS derived from the National Air Quality Strategy (NAQS) for England and Wales (and where they differ, AQSS derived from the Air Quality Standards Regulations 2010) are summarised in Table 2.1.

Table 2.1: Air Quality Objectives Relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit ($\mu\text{g}/\text{m}^3$)
Fine particles (PM_{10})	1 calendar year	-	40
	24 hours	35	50
Fine particles ($\text{PM}_{2.5}$)	1 calendar year	-	25

The Environmental Protection Act 1990 may be used to regulate 'statutory nuisance', including dust and other specified 'nuisances' related to air quality. Section 3 empowers local authorities to issue abatement notices where a nuisance *"unreasonably and substantially interfere[s] with the use or enjoyment of a home or other premises"* or where it could *"injure health or be likely to injure health."*

¹ Relevance, in this case, is defined by the scope of the assessment.

2.2 Planning Policy

2.2.1 Local Planning Policy

The SDDC's adopted local plan states that:

"The Council will support development that does not lead to adverse impacts on the environment or amenity of existing and future occupiers within or around proposed developments. The Council will take into consideration the following:... The potential for development to affect designated Air Quality Management Areas (AQMAs)"

Also that:

"...any future proposals would be required to conform to existing policies in the Part 1 Local Plan which require that a Travel Plan support new development schemes and the Council's emerging Design Guidance which requires that measures to address air quality are considered within planning proposals."

2.3 Relevant Guidance

2.3.1 IAQM Guidance on the Assessment of Dust from Demolition and Construction

The IAQM published a guidance document in 2014 (Holman et al., 2014) on the assessment of demolition and construction phase impacts. In order to assess the potential impacts, construction activities are divided into four types:

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

The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure (i.e. human health) and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified. Further details of this guidance are provided in Appendix A and the guidance has been used for the assessment of dust impacts and to identify appropriate mitigation measures.

2.3.2 IAQM Guidance of Air Quality Monitoring in the Vicinity of Demolition and Construction Sites

The IAQM published revised guidance in 2018 (Bull et al. 2018) on air quality monitoring in the vicinity of demolition and construction sites which provides high level advice on monitoring but is not designed to be prescriptive with regards the various monitoring techniques that can be used.

3 BASELINE AIR QUALITY CHARACTERISATION

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources.

A desk-based study was undertaken including a review of monitoring data available from SDDC and estimated background data from the Local Air Quality Management (LAQM) Support website operated by the Department for Environment, Food and Rural Affairs (Defra). Consideration was also given to potential sources of air pollution in the vicinity of the application site.

3.1 Emissions Sources and Key Air Pollutants

Transport-related emissions are one of the main sources of air pollution in urban areas. NO₂, PM₁₀, and PM_{2.5} are generally regarded as the three most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions. These pollutants are generally considered to have the greatest potential to result in human health impacts and are the substances of most concern in terms of existing levels in the area, as discussed below.

The focus of this assessment is emissions of 'dust', PM₁₀ and PM_{2.5} which may be a component of these particulate matter emissions

3.2 Local Authority Review and Assessment of Air Quality

As directed by the Environment Act 1995, local authorities are required to review and assess air quality with respect to the standards and objectives for the pollutants specified in the Government's National Air Quality Strategy (NAQS, 2007). Local authorities are required to undertake annual reporting of the concentrations of defined pollutants in their area.

According to the SDDC's Air Quality Annual Status Report for 2018, the council has no automatic air quality monitoring sites. Therefore, the council has no monitoring data for PM₁₀ and PM_{2.5}.

3.3 LAQM Background Data

Estimated background air quality data available from the LAQM-Tools website, may also be used to establish likely background air quality conditions at the proposed development site.

This website provides estimated annual average background concentrations of PM₁₀ and PM_{2.5} on a 1km² grid basis. Table 3.3 identifies estimated annual average background concentrations for the grid square containing the proposed development site for 2019. No exceedances of the PM₁₀ or PM_{2.5} Air Quality Objectives (AQO) are predicted. For concentrations in future years, Defra data predicts future decreases in the background concentrations.

Table 3.2: 2019 Estimated Background Annual Average PM₁₀ and PM_{2.5} Concentrations at the Proposed Development Site

Assessment Year	Annual Mean Concentration (µg/m ³)	
	PM ₁₀	PM _{2.5}
2019	13.2	8.6
Air Quality Objective	40	25

Note: Presented concentrations for 1 km² grid centred on 424500, 330500; approximate centre of development site is 424816, 330894

4 CONSTRUCTION PHASE IMPACT ASSESSMENT

4.1 Methodology

In accordance with the IAQM guidance, the risk of dust and particulate emissions affecting sensitive receptors in the area around the proposed development site was assessed based on the 'area sensitivity' and the magnitude of emissions from each of the following types of construction activity:

- Earthworks;
- Construction; and
- Trackout.

For each activity, the risk of site-derived dust and particulate emissions affecting local sensitive receptors is determined as either negligible, low, medium or high risk. The risk category may differ for each of the activities and depends on the potential emissions magnitude and the sensitivity of the area. Three different types of impact are considered:

- Disamenity due to dust soiling;
- Impacts on sensitive ecological receptors, and;
- The risk of health effects due to an increase in exposure to PM₁₀.

It is understood that there will be no demolition works during the development of the site and this has therefore not been considered further within this report.

The assessment is used to define the appropriate level of mitigation required. Appendix A sets out the construction dust assessment methodology in further detail.

4.1.1 Potential Dust Emission Magnitude

With reference to the IAQM criteria outlined in Appendix A, the dust emission magnitudes for earthworks, construction and trackout activities are summarised in Table 4.1.

Where information is not yet known, a conservative approach has been adopted and professional judgement has been used based on the scale of the proposed development and experience of working on similar schemes.

There is no demolition scheduled to take place at this site and so has not been considered here.

Table 4.1: Summary of Dust Emission Magnitudes (Before Mitigation)

Activity	IAQM Criteria	Dust Emission Magnitude
Earthworks	- Total area of earthworks is 25,000 - 10,000m² - Soil type of the site is loamy soil - The number of heavy earth moving vehicles active at any one time will be 5- 10. - Height of stockpiled materials is predicted to be <4m. - The total weight of material to be moved is <20,000 tonnes - Earthworks are taking place in both wet and dry seasons.	Medium
Construction	- The total volume of buildings to be built is estimated to be 20,000-100,000m³ - On site concrete batching or sandblasting is potentially proposed. - There will be potentially dusty construction vehicles on site	Medium
Trackout	- The maximum number of heavy-duty vehicle (HDV) outward a movement in any one day is anticipated to be 10-50. - The surface type on site is potentially dusty - The extent of unpaved road length within the site is 50-100m.	Medium

4.1.2 Dust Sensitivity of the Receptors

Dust sensitive receptors were identified in the vicinity of the proposed development site following the guidance published by the SPG. The sensitivity of the area to dust soiling, and human health is summarised in Table 4.2.

The Natural England MAGIC Maps website indicates that there are no Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas, Ramsar sites, National Nature Reserves or Local Nature Reserves) within 50m of the site boundary or potential trackout routes.

Impacts of ecological receptors are therefore not considered applicable and have not been considered further.

As trackout dust emission magnitude has been determined as medium, a 200m trackout route has been considered with traffic being routed onto Derby Road.

Table 4.2: Summary of the Sensitivity of the Area to Dust Soiling and Human Health.

Potential Impact		Sensitivity of the Surrounding Area		
		Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	High	High	High
	Number of receptors and distance from the source	<50m 60 + nursery	<50m 60 + nursery	<50m 60 + nursery
	Overall Sensitivity of the Area	Medium	Medium	Medium
Human health	Receptor sensitivity	High	High	High
	Annual mean PM ₁₀ concentration	<24µg/m ³	<24µg/m ³	<24µg/m ³
	Number of receptors and distance from the source	<50m 60 + nursery	<50m 60 + nursery	<50m 60 + nursery
	Overall Sensitivity of the Area	Low	Low	Low

4.1.3 Overall Dust Risks

Combining the dust emissions magnitude and the sensitivity of the surroundings, the overall dust risks associated with the proposed development were assessed and are presented in the below Table 4.3.

Table 4.3: Summary of the Dust Risk from all Enabling Work Activities

Potential Impact	Dust Risk Impact		
	Earthworks	Construction	Trackout
Dust soiling	Medium	Medium	Medium
Human health	Low	Low	Low

The aim of this AQMP is to specify appropriate mitigation such that, provided the mitigation is effectively applied, no significant effects are anticipated for dust, and particulates.

Mitigation measures to reduce potential impacts, based on this assessment, are defined in Section 5.

5 CONTROL MEASURES AND MITIGATION

5.1 Mitigation Measures

Mitigation measures recommended in the IAQM guidance are divided into 'general measures', applicable to all sites and measures specific to demolition, earthworks and trackout. Depending on the level of risk assigned to each site, different mitigation is recommended.

For those mitigation measures that are general, the highest risk assessed has been applied. In this case, the 'medium risk' site mitigation measures have been applied, as determined by the dust risk assessment in Section 4. Two categories of mitigation measure are described in the IAQM guidance – 'highly recommended' and 'desirable', which are indicated according to the dust risk level identified in Table 4.3.

Professional judgement has been used to remove or amend IAQM measures where they are not applicable to the site as well as including some site-specific measures that are not specifically detailed within the IAQM guidance.

Communications

- Develop and implement a stakeholder communications plan that included community engagement before work commences on site
- Develop a dust management plan which may include measures to control other emissions, approved by the Local Authority.
- 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.

Site Management

- Record and respond to all dust and air quality pollutant emissions complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record when the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.

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 LA when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided if necessary.

- Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions and dust are being carried out, and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux or real time PM₁₀ continuous monitoring locations with the LA. Where possible commence baseline monitoring at least three months before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- Plan site layout: machinery and dust causing activities should be located away from receptors.
- 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.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials which have the potential to generate dust (e.g. crushed concrete) from the site as soon as possible.
- Cover or fence stockpiles to prevent wind 'whipping'.

Operating vehicle/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 possible.
- *Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes 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 appropriate).*
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- *Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).*

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 mitigation (using recycled water where possible).
- Use enclosed chutes, conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Avoid bonfires or burning of waste materials.

Specific to Earthworks

- *Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.*
- *Use Hessian, mulches or trackifiers [or sheeting] 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.*

Specific to construction

- *Avoid scabbling (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 emissions 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.*

Specific to Trackout

- Regularly use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent the 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.
- Install hard surfaced haul routes and regularly dampen down with sprinkler system or mobile water bowsers, with regular cleaning.
- Implement 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, where site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.

This AQMP Plan provides a robust suite of control and mitigation measures for the earthworks, construction and trackout activities. The measures aim to control dust and general pollution from site operations, and this AQMP includes details of monitoring activities that are recommended to be undertaken (Section 6). Controls should be applied throughout the enabling works to ensure that emissions are mitigated.

The dust emitting activities outlined in Section 4 can be effectively controlled by implementing the appropriate dust control measures detailed and any adverse effects can be greatly reduced or eliminated.

As noted within the 2014 IAQM guidance, with the use of effective mitigation it is normally possible to minimise impacts and therefore the residual effect will normally be 'not significant'.

6 MONITORING RESIDUAL IMPACTS

Monitoring ambient pollutant levels during site activities can be used to:

- Demonstrate the efficiency of mitigation measures;
- Reduce costs by effective targeting of mitigation measures;
- Demonstrate compliance with regulatory or other standards;
- Demonstrate a commitment to reduce environmental impacts;
- Reduce complaints from site staff and the public;
- Reduce potential for conflict with regulators; and
- Speed up dispute resolution.

Monitoring regimes can range from real time, continuous monitoring to the visual assessment of dust generation. Simple and inexpensive monitoring of construction impacts may be conducted by means of a number of techniques, including dust deposition monitoring (e.g. by 'Frisbee' dust deposition gauge), and optical real-time continuous particle monitors (e.g. nephelometers).

The risk of dust impacts from the site activities during the enabling was identified in Table 4.3 as a maximum of 'Medium' for dust soiling and 'Low Risk' for human health.

In accordance with the IAQM guidance, a monitoring campaign including visual dust observation, dust deposition monitoring (using 'Frisbee' dust deposition gauges) is recommended, as set out below.

6.1 Visual Inspection

The Site Manager should undertake regular visual inspections / observations of visible dust as is practicable or where they suspect high levels of dust-generating activities may have occurred, and should undertake a visual inspection whenever a complaint regarding dust generation is received. The extent of the inspection will generally be on-site but should be extended to the trackout routes, especially on days with heavy traffic movements in and out of the site.

The findings of visual inspections should be documented and mitigation measures reviewed and implemented as appropriate. The log book entry should include:

- Time & date;
- Reason for inspection (e.g. complaint received, regular inspection);
- Confirmation of any visible dust emissions;
- Remedial actions taken if emissions observed; and
- Wind direction and strength (a weather station, wind sock or knowledge of the Beaufort Scale would assist in this process).

It is important that all site personnel are aware of the requirement for the control of environmental impacts, and appropriate training should be given to all site personnel, covering:

- Health and environmental impacts of emissions to air;
- The benefits of controlling emissions to air;
- Emission control measures;
- Method statements; and
- Importance of good communication.

6.2 Dust Deposition Monitoring

The deposition of dust on surfaces may be one of the main causes of air pollution complaints from earthwork activities. The 'Frisbee' dust deposition gauge, developed by the Stockholm Environment Institute (SEI) at the University of York is established as a simple and robust method for the quantification of dust deposition.

Dust is collected on a horizontal surface and collection bottle. The dust is determined gravimetrically on a filter paper in the laboratory.

It is recommended that 'Frisbee' dust deposition gauges be installed close to the site boundary. The monitoring locations are suggested to be located near the sensitive receptors, where present. The locations of the 'Frisbees' monitoring sites will be reviewed and updated if required, according to the enabling activities on the site. It is recommended that monitoring is undertaken and maintained throughout the enabling works period. 'Frisbee' samples should be sent to an accredited laboratory for analysis.

It is proposed that the Frisbee samples are changed every month. The results should be compared with the Suggested Guidelines for Deposited Ambient Dust (Published by Vallack & Shillito), with a trigger value of 200mg/m²/day (averaged over the monthly period) considered given the 'residential areas & urban outskirts' setting of the site.

6.3 PM₁₀ Monitoring using Real-Time Dust Monitors

If dust complaints are received or works likely to create significant dust are planned, it is recommended that real-time monitoring is undertaken, where practicable.

Nephelometer instruments are not a reference equivalent method for the determination of airborne particulates; however, nephelometers provide near continuous or short-term average data in near real-time that may be related to site events and are considered an appropriate and economical technique for this type of application.

These instruments measure continuous indicative concentrations of the PM₁₀ fraction of suspended particle matter and the data are posted in near real-time to a website and are immediately viewable.

A Site Action Level (SAL) level of 190µg/m³ (1-hour average PM₁₀) which is recommended in the latest IAQM guidance titled “*Guidance on Monitoring in the Vicinity of Demolition and Construction Sites*” would be adopted for the site. If this level is reached, an email will be sent to the air quality team at RSK, and the Site Manager and the relevant manager for Bellway Homes.

If the Site Manager receives an email stating that the SAL has been exceeded, the following actions should be taken:

- Review the activities on site and determine if there is dust being generated from on-site activities;
- If the exceedance is deemed to be from the site activities, apply additional mitigation as soon as is practicable;
- These additional mitigation measures would be agreed with the Site Manager and will remain in place until a time that the ambient PM₁₀ concentrations are below the SAL; and
- The occurrence should be recorded as a ‘dust incident’ or similar in the complaints log.

7 IMPLEMENTATION AND MANAGEMENT

7.1 Implementation of Air Quality Management Plan

The Site Manager shall be responsible for the control of environmental impacts of the enabling activities. The Site Manager should be provided with appropriate training so that they are aware of how dust and PM₁₀ can be generated on site, are aware of the requirements of the AQMP (including visual dust inspections) and are aware of the routine and emergency procedures designed to control dust emissions.

The Site Manager should contribute to site inductions and refresher training for all site personnel (as detailed below), detailing how responsibility for dust emissions management should be delegated. They should make all relevant site personnel and their appointed air quality consultants aware of any significant changes to site practices which may affect dust generation as soon as practicable and should keep method statements up-to-date.

It is recommended that new members of staff are provided with dust awareness training, covering the sources of dust and PM₁₀ on site, the health and environmental impacts of emissions to air, general emissions control measures being utilised on site.

As detailed in Section 6, the Site Manager will keep a site log book documenting the maintenance of effective emissions control methods and details of any complaints or incidents, and actions taken.

Emissions control procedures and equipment will only work satisfactorily if carried out or used appropriately. The responsible person shall maintain good housekeeping and ensure that all equipment is well maintained and used appropriately.

7.1.1 Reactive mitigation measures

Following reports made by site personnel of visibly elevated concentrations of dust or following dust-related complaints from third parties, it is recommended that an investigation is carried out, documented and appropriate mitigation is applied.

The Site Manager should be responsible for ensuring that appropriate steps are taken to minimise the impacts of the dust event. Appropriate mitigation may include but not necessarily be limited to the following:

- Erect solid screens or barriers around the activities generating the elevated dust/ PM concentrations that are at least as high as the dust-generating activity;
- Cover or dampen stockpiles or other sources of dust (e.g. on-site haul roads) to reduce fugitive dust;

- Ensure that site personnel have switched off machinery when not in use and that all personnel are adhering to site speed limits;
- Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible);
- Ensure that the other mitigation methods identified in Section 5 are complied with by undertaking visual inspections; and,
- Clean up any dry spillages using wet cleaning methods.

It may be appropriate to temporarily suspend particularly dusty site activities where dust concentrations are high for example during abnormal circumstances, where dust suppression equipment malfunctions, or 'emergency' circumstances.

7.2 Proposed Reporting Programme

As detailed in Section 6, monthly reports should be prepared. The content of the reports may vary according to future requirements of the programme, but it is anticipated that the reports will contain the following:

- Details of the monitoring programme and of the enabling activities undertaken during the monitoring period;
- Presentation of dust deposition rates/particulate matter concentrations at all monitoring locations and;
- Discussion/explanation of any exceedances of the relevant dust / particulate matter standards; and
- Description of mitigation activities applied following dust episode(s) or the receipt of complaints from on-site personnel/ off-site receptors in relation to the identified enabling activities.

APPENDIX A – CONSTRUCTION DUST ASSESSMENT METHODOLOGY

This appendix contains the construction dust assessment methodology used in the assessment.

To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based on the IAQM 2014 guidance. The assessment follows the steps recommended in the guidance.

Step 1: Screen the requirement for assessment

The first step is to screen out the requirement for a construction dust assessment, this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

- a 'human receptor' within:
 - 350m of the boundary of the site; or
 - 50m of the route used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an 'ecological receptor':
 - 50m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large:** Total building volume $>50,000\text{m}^3$, potentially dusty construction material, on-site crushing and screening, demolition activities $>20\text{m}$ above ground level;
- **Medium:** Total building volume $20,000\text{m}^3 - 50,000\text{m}^3$, potentially dusty construction material, demolition activities $10\text{m} - 20\text{m}$ above ground level; and,
- **Small:** Total building volume $<20,000\text{m}^3$, construction material with low potential for dust release, demolition activities $<10\text{m}$ above ground, demolition during wetter months.

Earthworks

The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large:** Total site area >10,000m², potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes;
- **Medium:** Total site area 2,500 – 10,000m², moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes; and,
- **Small:** Total site area < 2,500m², 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 <10,000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large:** Total building volume >100,000m³, piling, on site concrete batching;
- **Medium:** Total building volume 25,000 – 100,000m³, potentially dusty construction material (e.g. concrete), piling, on site concrete batching; and,
- **Small:** Total building volume <25,000m³, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large:** >50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium:** 10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and,
- **Small:** <10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following 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.

Table A1 was used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table A1: Sensitivity of the Area Surrounding the Site

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
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. - 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. 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) - 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. - 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. - 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 to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home. - The appearance, aesthetics or value of their property could be diminished by soiling. - 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. - Examples include parks and places of work.	- Locations where the people exposed are workers 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). - 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. - Locations with a national designation where the features may be affected by dust deposition. - Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Low	- The enjoyment of amenity would not reasonably be expected. - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. 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. - Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	- Locations where human exposure is transient. 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. - Example is a local Nature Reserve with dust sensitive features.
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Based on the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. Tables A2 to A4 indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the guidance, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distances 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 A3: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³ (>18 µg/m ³ in Scotland)	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m ³ (16-18 µg/m ³ 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/m ³ (14-16 µg/m ³ in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³ (<14 µg/m ³ 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/m ³ (>18 µg/m ³ in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m ³ (16-18 µg/m ³ in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m ³ (14-16 µg/m ³ in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		>10	Low	Low	Low	Low	Low

	(<14 µg/m ³ in Scotland)	1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the area to Ecological Impacts

Receptor Sensitivity	Distances from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Defining the Risk of Impacts

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. Tables A5 to A7 indicate the method used to assign the level of risk for each construction activity.

Table A5: Risk of Dust Impacts from 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 A6: Risk of Dust Impacts from Earthworks/Construction

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

Table A7: Risk of Dust Impacts from Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk

Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible