

Appendix 10.2 - Construction Dust Assessment

Reference: 4805

Date 3rd February 2025



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1.0 INTRODUCTION

- 1.1.1 This Technical Appendix provides the detailed methodology and assessment of potential impacts associated with fugitive dust emissions during the construction stage. It should be read in conjunction with the Air Quality Chapter of the Environmental Statement and the other Technical Appendices.
- 1.1.2 The 'Site' referred to in this Technical Appendix refers to an area under construction within the Assessment Boundary.

2.0 METHODOLOGY

2.1 Introduction

2.1.1 There is the potential for fugitive dust emissions to occur as a result of construction stage activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V2.2'¹.

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

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

2.1.3 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;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to particulate matter with an aerodynamic diameter of less than 10µg/m³ (PM₁₀).

2.1.4 The assessment steps are detailed below.

2.2 Step 1

2.2.1 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the boundary or 50m from the construction vehicle route up to 250m from the Site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the Site or the construction

¹ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

vehicle route up to 250m from the Site entrance, then the assessment also proceeds to Step 2.

2.2.2 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

2.3 Step 2

2.3.1 Step 2 assesses the risk of potential dust impacts. A Site is allocated 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).

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

2.3.3 Step 2A defines the potential magnitude of dust emission through the construction stage. The relevant criteria are summarised in Table 10.2.1.

Table 10.2.1 Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 75,000m³ • Potentially dusty construction material (e.g. concrete) • On site crushing and screening • Demolition activities greater than 12m above ground level
	Earthworks	• Total site area greater than 110,000m² • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 6m in height

Magnitude	Activity	Criteria
	Construction	- Total building volume greater than 75,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Demolition	- Total building volume 12,000m³ to 75,000m³ - Potentially dusty construction material - Demolition activities 6m to 12m above ground level
	Earthworks	- Total site area 18,000m² to 110,000m² - Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time - Formation of bunds 3m to 6m in height
	Construction	- Total building volume 12,000m³ to 75,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	20 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	Demolition	- Total building volume less than 12,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber) - Demolition activities less than 6m above ground levels - Demolition during wetter months
	Earthworks	- Total site area less than 18,000m² - Soil type with large grain size (e.g. sand) - Less than 5 heavy earth moving vehicles active at any one time - Formation of bunds less than 3m in height
	Construction	- Total building volume less than 12,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	- Less than 20 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

2.3.4 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 10.2.2.

Table 10.2.2 Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	- Users expect high levels of amenity - High aesthetic or value property - People expected to be present continuously for extended periods of time - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀. e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	- Users would expect to enjoy a reasonable level of amenity - Aesthetics or value of their property could be diminished by soiling - People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	- Enjoyment of amenity would not reasonably be expected - Property would not be expected to be diminished in appearance - Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve

2.3.5 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 10.2.3.

Table 10.2.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
High	More than 100	High	High	Medium	Low

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

2.3.6 Table 10.2.4 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 10.2.4 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
	28 - 32µg/m ³	1 - 10	Medium	Low	Low	Low
		More than 10	Medium	Low	Low	Low
	24 - 28µg/m ³	1 - 10	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low
	Less than 24µg/m ³	1 - 10	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low
	Less than 24µg/m ³	1 - 10	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low

2.3.7 Table 10.2.5 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 10.2.5 Sensitivity of the Area to Ecological Impacts

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

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

2.3.9 Table 10.2.6 outlines the risk category from demolition activities.

Table 10.2.6 Dust Risk Category from Demolition Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

2.3.10 Table 10.2.7 outlines the risk category from earthworks, construction and trackout activities.

Table 10.2.7 Dust Risk Category from Earthworks, Construction and Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

2.4 Step 3

2.4.1 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance² to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

2.5 Step 4

2.5.1 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of

² Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

3.0 **RISK ASSESSMENT**

3.1 **Screening and Receptor Identification**

- 3.1.1 The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction stage. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.
- 3.1.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

Receptor Identification

- 3.1.3 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 250m from the Site. This utilised mapping resources available from GoogleEarth, Google Streetview and Ordnance Survey. These are summarised in Table 10.2.8.

Table 10.2.8 Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	More than 100	0
Up to 100	More than 100	-
Up to 250	More than 100	-

- 3.1.4 Human receptors within 250m of the Site are largely associated with residential and commercial properties.
- 3.1.5 No ecological receptors were identified within 250m of the Site boundary.

- 3.1.6 Access for construction vehicles will be from the existing Moss Hall Road route via the Moss Hall Road /Pilsworth Road junction to the north of the Site. Future access may occur from the south of the Site, via the M62 for the later phases of development, subject to implementation of highways infrastructure. Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the potential access routes within 250m of the Site access. These are summarised in Table 10.2.9.

Table 10.2.9 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	10 - 100	0

- 3.1.7 Human receptors within 50m of the road network up to 250m from the relevant Site access are largely associated with residential and commercial properties.
- 3.1.8 No ecological receptors were identified within 50m of the of the road network up to 250m from the Site access.

Background Pollutant Concentrations

- 3.1.9 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by the Department for Environment, Food and Rural Affairs (DEFRA) for the entire of the UK to assist Local Authorities in their review and assessment of air quality. The Site is located in a number of grid squares. Data for the relevant locations was downloaded from the DEFRA website³ for the purpose of this assessment and is summarised in Table 10.2.10.

Table 10.2.10 Background Pollutant Concentration Predictions

National Grid Reference (m)	Predicted 2025 PM _{2.5} Background Concentration (µg/m ³)
382500, 408500	13.48

³ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>.

National Grid Reference (m)	Predicted 2025 PM _{2.5} Background Concentration (µg/m ³)
383500, 408500	12.36
383500, 407500	13.12
384500, 408500	12.70
384500, 407500	13.69

Overall Sensitivity of the Area

3.1.10 The human receptors identified in Table 10.2.8 and Table 10.2.9 include residential properties. Based on the criteria shown in Table 10.2.2, the sensitivity of the receiving environment to potential dust impacts was therefore classified as **high**. This was because receptors included the following examples outlined within the guidance:

- Locations where users would expect to enjoy a reasonable level of amenity;
- Aesthetics or value of the property could be diminished by dust soiling; and,
- Positions where people would be expected to be present for extended periods of time e.g. residential properties.

Sensitivity to Specific Dust Impacts

3.1.11 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Table 10.2.3 and Table 10.2.4. For the purpose of determining the sensitivity to human health impacts, the annual mean PM₁₀ concentration was assumed to be below 24µg/m³ based on the data obtained from DEFRA, as shown in Table 10.2.11.

Table 10.2.11 Sensitivity of the Surrounding Area to Specific Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low

3.1.12 The potential risk of dust impacts at the identified receptors is considered in the following Sections.

3.2 **Assessment of Risk**

- 3.2.1 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 250m of the Site. As such, a detailed assessment of potential dust impacts was required.

Demolition

- 3.2.2 Demolition will be undertaken at the start of the construction stage and will involve clearance of a number of residential, commercial and agricultural buildings. In addition, where present, below ground structures such as drains, hardstanding, mine workings, service ducts and pipelines will be removed. It is estimated that the building volume to be demolished is greater than 75,000m³. In accordance with the criteria outlined in Table 10.2.1 the magnitude of potential dust emissions from demolition is therefore **large**.
- 3.2.3 Table 10.2.11 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 10.2.6 the Project for Assessment is considered to be a **high** risk site for dust soiling as a result of demolition.
- 3.2.4 Table 10.2.11 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 10.2.6, the Project for Assessment is considered to be a **medium** risk site for human health impacts as a result of demolition.

Earthworks

- 3.2.5 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The Site covers an area greater than 110,000m². Additionally, it is anticipated that there will be more than 10 heavy earth moving vehicles active at any one time. In accordance with the criteria outlined in Table 10.2.1, the magnitude of potential dust emissions from earthworks is therefore **large**.
- 3.2.6 Table 10.2.11 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 10.2.7, the Project for Assessment is considered to be a **high** risk site for dust soiling as a result of earthworks.

- 3.2.7 Table 10.2.11 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 10.2.7 the Project for Assessment is considered to be a **low** risk site for human health impacts as a result of earthworks.

Construction

- 3.2.8 The total building volume to be developed is greater than 100,000m³. In accordance with the criteria outlined in Table 10.2.1, the magnitude of potential dust emissions from construction is therefore **large**.
- 3.2.9 Table 10.2.11 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 10.2.8, the Project for Assessment is considered to be a **high** risk site for dust soiling as a result of construction activities.
- 3.2.10 Table 10.2.11 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in in Table 10.2.7, the Project for Assessment is considered to be a **low** risk site for human health impacts as a result of construction activities.

Trackout

- 3.2.11 Due to the size of the Site, the unpaved road length is likely to be more than 100m during certain stages of construction. In accordance with the criteria outlined in Table 10.2.1, the magnitude of potential dust emissions from trackout is therefore **large**.
- 3.2.12 Table 10.2.11 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 10.2.7, the Project for Assessment is considered to be a **high** risk site for dust soiling as a result of trackout activities.
- 3.2.13 Table 10.2.11 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 10.2.7, the Project for Assessment is considered to be a **low** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

3.2.14 A summary of the risk from each dust generating activity is provided in Table 10.2.12.

Table 10.2.12 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Medium	Low	Low	Low

3.2.15 As indicated in Table 10.2.12, the potential risk of dust soiling is **high** from demolition, earthworks, construction and trackout. The potential risk of human health effects is **medium** from demolition and **low** from earthworks, construction and trackout.

3.2.16 Based on the assessment results, appropriate control measures have been identified from the IAQM guidance⁴. These are outlined in Section 4.0 of this report.

3.2.17 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the Site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction stage.

⁴ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

4.0 MITIGATION MEASURES

4.1.1 The IAQM guidance⁵ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction stage. These have been adapted for the Site as summarised in Table 10.2.13. The specified measures will be included as part of the Construction Environmental Management Plan (CEMP).

Table 10.2.13 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Communications	• 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 • Display the head or regional office contact information • Develop and implement a Dust Management Plan, which may include measures to control other emissions, approved by the Local Authority
Site management	• Record and respond to all dust and air quality complaints • Make the complaints log available to Bury Council (BC) and Rochdale Borough Council (RBC) upon request • 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 • Hold regular liaison meetings with other high risk construction sites within 250m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised
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 • 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 BC and RBC when asked • Increase the frequency of Site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions

⁵ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Issue	Control Measure
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 • 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 from Site as soon as possible • Cover, seed 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 practicable • Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials • Implement a Travel Plan that supports an encourages sustainable travel
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the Site for effective dust suppression, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate • Ensure equipment is readily available on-site to clean any dry spillages, and clean up as soon as reasonably practicable after the event using wet cleaning methods
Waste management	• Reuse and recycle waste to reduce dust from waste materials • Avoid bonfires and burning of waste materials
Demolition	• Soft strip inside buildings before demolition • Ensure effective water suppression is used • 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

Issue	Control Measure
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 • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads if required • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving Site are covered to prevent escape of materials • 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 • Implement a wheel washing system, if required

4.1.2 Assuming the relevant mitigation measures outlined in Table 10.2.13 are implemented, the residual impact from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance⁶.

⁶ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.