

Appendix 7.2 - Construction Dust Methodology and Assessment



Table of Contents

1.0	INTRODUCTION	1
2.0	METHODOLOGY	2
2.1	Introduction	2
2.2	Step 1 - Screen the Need for an Assessment	2
2.3	Step 2 - Assess the Risk of Dust Impacts	3
2.4	Step 3 - Site-specific Mitigation	8
2.5	Step 4 - Determine Significant Effects	8
3.0	ASSESSMENT	9
3.1	Step 1 - Screen the Need for an Assessment	9
3.2	Step 2a - Define the Potential Dust Emission Magnitude	9
	Earthworks	9
	Construction	9
	Trackout	10
3.3	Step 2b - Define the Sensitivity of the Area	10
	Dust Soiling	10
	Human Health	10
3.4	Step 2c - Define the Risk of Dust Impacts	10
3.5	Step 3 - Site-specific Mitigation	11
3.6	Step 4 - Determine Significant Effects	13

1.0 INTRODUCTION

- 1.1.1 This Technical Appendix provides the detailed methodology and subsequent assessment for the determination 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 (ES) and the other Technical Appendices.

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 three types to reflect their different potential impacts. These are:

- 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 10µm (PM₁₀).

2.1.4 The assessment steps are detailed below.

2.2 Step 1 - Screen the Need for an Assessment

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 - Assess the Risk of Dust Impacts

- 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 1.

Table 1 Magnitude of Emission

Magnitude	Activity	Criteria
Large	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
	Construction	• Total building volume greater than 75,000m³ • On-site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Goods Vehicle (HGV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m

Magnitude	Activity	Criteria
Medium	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 110,000m³ - Potentially dusty construction material (e.g. concrete) - On-site concrete batching
	Trackout	20 to 50 HGV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	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 HGV 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 Proposed Development to potential dust impacts. The influencing factors are shown in Table 2.

Table 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 3.

Table 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
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low

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

2.3.6 Table 4 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 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	Low
		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
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	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
	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
		1 - 10	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low

2.3.7 Table 5 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 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 6 outlines the risk category from earthworks and construction activities.

Table 6 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

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

2.4 Step 3 - Site-specific Mitigation

- 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 - Determine Significant Effects

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

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

3.0 ASSESSMENT

3.1 Step 1 - Screen the Need for an Assessment

- 3.1.1 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. 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.
- 3.1.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 250m of the Site boundary. As such, a detailed assessment of potential dust impacts was required.

3.2 Step 2a - Define the Potential Dust Emission Magnitude

Earthworks

- 3.2.1 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as Site levelling and landscaping. The area of the Site is greater than 110,000m². In accordance with the criteria outlined in Table 1, the magnitude of potential dust emissions from earthworks is therefore **large**.

Construction

- 3.2.2 Due to the size of the Proposed Development, the total building volume will be greater than 75,000m³. In accordance with the criteria outlined in Table 1, the magnitude of potential dust emissions from construction is therefore **large**.

Trackout

- 3.2.3 Based on the Site area, it is anticipated that the unpaved road length will be greater 100m during some stages of construction. In accordance with the criteria outlined in Table 1, the magnitude of potential dust emissions from trackout is therefore **large**.

3.3 Step 2b - Define the Sensitivity of the Area

Dust Soiling

- 3.3.1 Table 7.8 of Chapter 7 of the ES shows that there are between 10 and 100 **high** sensitivity receptors within 20m of the Site boundary. The sensitivity of the area with respect to dust soiling from earthworks and construction, as defined using the criteria summarised in Table 3, is therefore considered to be **high**.
- 3.3.2 Table 7.9 of Chapter 7 of the ES shows that there are between 10 and 100 **high** sensitivity receptors within 20m of the road network within 250m of the Site access. The sensitivity of the area with respect to dust soiling from trackout, as defined using the criteria summarised in Table 3, is therefore considered to be **medium**.

Human Health

- 3.3.3 As shown in Table 7.6 of Chapter 7 of the ES, the 2026 annual mean PM₁₀ background concentration at the Site is 11.11µg/m³. As shown in Table 4, where the background annual mean PM₁₀ concentration is below 24µg/m³ and there are between 10 and 100 **high** sensitivity receptors within 20m of the Site boundary, the sensitivity of the area to potential human health from earthworks and construction is **low**.
- 3.3.4 There are between 10 and 100 **high** sensitivity receptors within 20m of the road network within 250m of the Site access. The sensitivity of the area with respect to human health from trackout, as defined using the criteria in Table 4, is therefore considered to be **low**.

3.4 Step 2c - Define the Risk of Dust Impacts

- 3.4.1 The derived dust emission magnitude for each activity has been combined with the sensitivity of the area to determine the risk of unmitigated impacts in line with the

methodology set out in Table 8. A summary of the risk from each dust generating activity is provided in Table 7.

Table 7 Summary of Potential Unmitigated Dust Risks

Potential Impact	Activity	Step 2A - Dust Emission Magnitude	Step 2B - Sensitivity of the Area	Step 2C - Risk
Dust Soiling	Earthworks	Large	High	High
	Construction	Large	High	High
	Trackout	Large	Medium	Medium
Human Health	Earthworks	Large	Low	Low
	Construction	Large	Low	Low
	Trackout	Large	Low	Low

3.4.2 As indicated in Table 7, the potential risk of dust soiling is **high** from earthworks and construction and **medium** from trackout. The potential risk of human health impacts is **low** from earthworks, construction and trackout.

3.4.3 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 phase.

3.5 Step 3 - Site-specific Mitigation

3.5.1 The IAQM guidance³ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the Site as summarised in Table 8. These will be incorporated into the Construction Environmental Management Plan for the Proposed Development, as outlined within Section 7.5.1 of Chapter 7 of the ES.

³ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Table 8 Summary of Potential Unmitigated Dust Risks

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 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 complains 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 • Hold regular liaison meetings with other high risk construction sites within 250m of the Site boundary
Monitoring	• Undertake daily on-Site or 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 the Dust Management Plan • 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
Site preparation	• 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 • Keep Site fencing, barriers and scaffolding clean using wet methods • Remove materials that have a potential to produce dust from Site as soon as possible • Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles witch off engines when stationary - no idling vehicles • Avoid the use of diesel or petrol powered generators • Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on unsurfaced haul roads

Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction • Ensure an adequate water supply at the Site for effective dust/particulate matter suppressions • Use enclosed chutes and 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 and burning of waste materials
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
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
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material trackout out of the Site • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving Site are covered to prevent escape of materials during transport • Implement a wheel washing system, if required

3.6 **Step 4 - Determine Significant Effects**

- 3.6.1 Assuming the relevant mitigation measures are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance.