



DCO Submission

Environmental Statement

Chapter 4: Air Quality and Odour
Appendix 4.3: Air Quality Construction Phase Dust Risk
Assessment

Document 6.4C

On behalf of
Oxfordshire Railfreight Limited

Prepared by Phlorum
March 2026

Appendix 4.3: Air Quality Construction Phase Dust Risk Assessment

Introduction

An assessment of the potential dust-related impacts arising from the construction of the Proposed Development was undertaken in accordance with Institute of Air Quality Management (IAQM) Guidance¹.

Construction Phase Dust Assessment

The construction phase of the Proposed Development will involve a number of activities that have the potential to impact local air quality. These include emissions of dust generated through demolition, excavation, construction, earthworks and trackout activities.

The location of sensitive receptors in relation to construction activities will affect the potential for such construction activities to cause dust soiling, nuisance and local air quality impacts. Meteorological conditions and the use of control measures will also affect how these impacts might be caused.

Step 1: Screen the Need for a Detailed Assessment

Step 1 of the IAQM guidance involves a screening assessment to consider whether a more detailed construction phase dust assessment is required.

In accordance with the guidance, a detailed assessment is required if:

- Human receptors are located within 250m of the boundary of the site or within 50m of routes used by construction vehicles on the public highways, up to 250m from the site entrances; or
- Ecological receptors are located within 50m of the boundary of the site or within 50m of routes used by construction vehicles on the public highways, up to 250m from the site entrances.

Construction phase dust assessment distance buffers, as set out in IAQM guidance, are presented in Figure 4.3.1 and were utilised within the assessment to determine the number of receptors within the distance bands for determining receptor sensitivity.

¹ Institute of Air Quality Management. (2024). *Guidance on the assessment of dust from demolition and construction (Version 2.2)*.

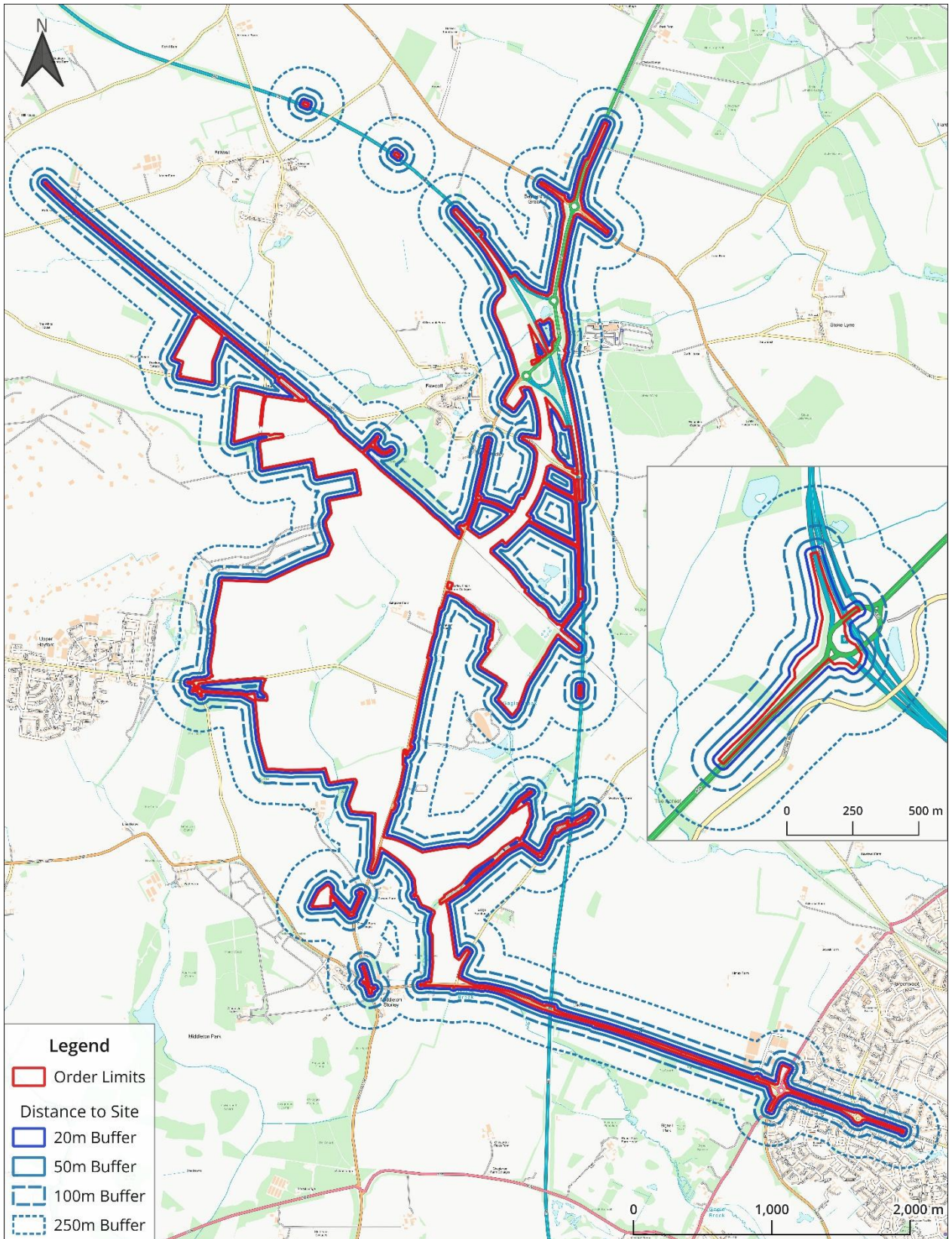


Figure A4.3.1: Construction Phase Buffer Zones

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Job No: 14159
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Date: 09/02/2026
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From a review of the Multi Agency Geographic Information for the Countryside (MAGIC) website², the Ardley Cutting and Quarry SSSI and the Ardley Trackways SSSI are located within 20m of the Application Site boundary. Human receptors are located within 250m of the Application Site boundary, with the most sensitive of these receptors being residential dwellings. The closest residential dwellings are located within Heyford and Ardley. A full construction phase dust risk assessment was therefore undertaken.

Step 2: Assess the Risk of Dust Impacts

Step 2A: Define the Potential Dust Emission Magnitude

The dust emission magnitudes for the construction activities were defined using the criteria detailed in the IAQM guidance as detailed in Table 4.3.1.

Table 4.3.1: Determination of the Sensitivity of the Study Area

Activity	Dust Emission Magnitude	Dust Emission Magnitude Criteria
Demolition	Large	Total building volume >75,000m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level.
	Medium	Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material, demolition activities 6 - 12m above ground level.
	Small	Total building volume <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.
Earthworks	Large	Total site area >110,000m 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 18,000m ² – 110,000m 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.
	Small	Total site area <18,000m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3m in height.
Construction	Large	Total building volume >75,000m ³ , on site concrete batching, sandblasting.
	Medium	Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching.
	Small	Total building volume <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m.
	Medium	20 - 50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m.
	Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

² <https://magic.defra.gov.uk/MagicMap.html>

The following dust emission magnitudes were defined for the Proposed Development:

- 🌿 **Demolition:** The Proposed Development will comprise the partial demolition of Ashgrove Cottage and the associated farm. Therefore, the total building volume to be demolished will be between 12,000m³ and 75,000m³ and the overall dust emission magnitude for demolition was defined as **Medium**.
- 🌿 **Earthworks:** During the earthworks stage of the construction phase for the Proposed Development, there will be the stripping of topsoil on the Main Site, for which the composition includes clay, as detailed in **ES Chapter 11: Ground Conditions**. In accordance with the IAQM guidance, clay is prone to suspension due to its small particle size. In addition, the Application Site area is greater than 110,000m². Therefore, the overall dust emission magnitude for earthworks was defined as **Large**.
- 🌿 **Construction:** As detailed in **ES Chapter 2: Description of Development and Alternatives**, the Proposed Development on the Main Site comprises an intermodal rail terminal, including up to 603,850m² of warehousing. The total building volume will therefore be greater than 75,000m³ and the overall dust emission magnitude for construction was defined as **Large**.
- 🌿 **Trackout:** There are anticipated to be more than 50 HDV outward movements in any one day during the peak of the construction phase. In addition, the topsoil of the Main Site comprises clay and therefore the surface material has a large potential for dust generation. The overall dust emission magnitude for trackout was therefore defined as **Large**.

A summary of the defined dust emissions magnitudes for the Proposed Development are provided in Table 4.3.2.

Table 4.3.2: Dust Emission Magnitudes for each Construction Stage

Construction Stage	Dust Emission Magnitude
Demolition	Medium
Earthworks	Large
Construction	Large
Trackout	Large

Step 2B: Define the Sensitivity of the Area

The assessment requires the determination of the sensitivity of the area for the purposes of dust soiling, human health and ecological impacts. The sensitivity of the study area takes into account the specific receptors in the vicinity of the Application Site, the proximity and number of those receptors, the local background concentration of PM₁₀ and site-specific factors. Figure 4.3.1 was utilised to determine the number of receptors located within the distance bands provided in the IAQM guidance for determining receptor sensitivity.

The sensitivity of the area is defined below, in accordance with IAQM criteria and is summarised in Table 4.3.3.

- 🌿 Dust Soiling – There are over 100 existing residential receptors located within 50m of the Application Site boundary, inclusive of the Main Site and the wider Order Limits. Such residential receptors are considered to be *Highly Sensitive* to dust soiling in accordance with IAQM guidance. There are also a number of public footpaths and bridleways located within 20m of the Application Site boundary where more than one receptor may be present and which are considered to be of *Low Sensitivity* to dust soiling impacts. As there are more than 100 High Sensitivity residential receptors within 50m of the Application Site boundary, the sensitivity of the area to dust soiling is defined as ‘**High**’ in line with IAQM guidance.
- 🌿 Human Health – There are more than 10, but fewer than 100 existing highly sensitive residential receptors located within 20m of the Application Site boundary. Defra’s UK-AIR background maps indicate that background PM₁₀ concentrations in the vicinity of the Application Site are less than 24µg.m⁻³. Therefore, the sensitivity of the area to human health effects is defined as ‘**Low**’.
- 🌿 Ecological – The Ardley Cutting and Quarry SSSI is located within 20m of the Application Site boundary. The Project Ecologists advised that this ecological designation has a Medium Sensitivity to dust, as it is a national designation with dust sensitive features. In addition, the Ardley Trackways SSSI is located within 20m of the Application Site boundary, which can also be considered of Medium Sensitivity to dust. Therefore, to provide a conservative assessment, the sensitivity of the area to ecological effects was defined as ‘**Medium**’.

Table 4.3.3: Determination of the Sensitivity of the Study Area

Potential Impact	Sensitivity			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecological Effects	Medium	Medium	Medium	Medium

Step 2C: Define the Risk of Impacts

The dust emission magnitude determined in Step 2A is then combined with the sensitivity of the area determined in Step 2B to define the risk of dust impacts with no mitigation applied. The results of this assessment are detailed in Table 4.3.4.

Table 4.3.4: Summary Dust Risk Table to Define Site Specific Risk

Activity	Step 2A: Dust Emission Magnitude	Step 2B: Sensitivity of the Area	Step 2C: Risk of Dust Impacts
Dust Soiling Effects on People and Property			
Demolition	Medium	High	Medium Risk
Earthworks	Large	High	High Risk
Construction	Large	High	High Risk
Trackout	Large	High	High Risk
Human Health Impacts			
Demolition	Medium	Low	Low Risk
Earthworks	Large	Low	Low Risk
Construction	Large	Low	Low Risk
Trackout	Large	Low	Low Risk
Ecological Effects			
Demolition	Medium	Medium	Medium Risk
Earthworks	Large	Medium	Medium Risk
Construction	Large	Medium	Medium Risk
Trackout	Large	Medium	Medium Risk

Step 3: Site-Specific Mitigation

The risk of dust impacts defined in Step 2C is used to determine the measures required to mitigate construction phase dust impacts.

Recommended construction phase mitigation measures are outlined in Tables 4.22 and 4.23 of **ES Chapter 4: Air Quality and Odour**. These recommendations are based on the IAQM's recommended mitigation measures for *High Risk* sites, with *Medium Risk* measures specific to demolition activities included, to reflect the reduced risk of impact determined for this phase, as demonstrated in Table 4.3.4.

Step 4: Determine Significant Effects

Following the implementation of the mitigation measures listed in Tables 4.22 and 4.23 of ES Chapter 4: Air Quality and Odour, emissions from the construction programme will be reduced and the residual significance of impact for construction phase dust emissions is expected to be *Negligible* and thus not significant, thereby complying with the requirements of the National Planning Policy Framework.



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