

**AIR QUALITY ASSESSMENT**

on behalf of

**ORION HOMES LTD**

for

**WHITEHALL ROAD WEST, BIRKENSHAW**

**REPORT DATE: 26 JUNE 2024**

**REPORT NUMBER: 103182**

**Miller Goodall Ltd  
Ground Floor  
Ashworth House  
Deakins Business Park  
Blackburn Road  
Egerton  
Bolton  
Lancashire  
BL7 9RP**

**Tel: 01204 596166**

**[www.millergoodall.co.uk](http://www.millergoodall.co.uk)**

Company registration number 5201673



# Summary

This air quality report has been prepared to accompany a planning application for a proposed residential development at Whitehall Road West, Birkenshaw. It assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.

Concentrations of NO<sub>2</sub> and PM<sub>10</sub> are likely to be below their respective long and short-term objectives at the proposed development site which is therefore considered suitable for residential use with regards to air quality. Concentrations of PM<sub>2.5</sub> are expected to be below the annual mean target.

The assessment has been prepared in accordance with the West Yorkshire Low Emissions Strategy Group Air Quality & Emissions Technical Planning Guidance and provides the specified mitigation.

The proposed development is not expected to have a significant effect on local air quality.

There is, therefore, no reason for this application to be refused on the grounds of air quality.

Prepared By Melody Horan

Reviewed By Philip Walton

Date

26 June 2024

Date

26 June 2024

### Record of changes

Version	Date	Change	Initials
1	26 June 2024	First issue	MH

# Contents

<b>Summary</b> .....	<b>2</b>
<b>Contents</b> .....	<b>3</b>
<b>1 Introduction</b> .....	<b>4</b>
<b>2 Site Description</b> .....	<b>4</b>
<b>3 Proposed Development</b> .....	<b>5</b>
<b>4 Policy Context</b> .....	<b>5</b>
4.1 Air Quality Objectives .....	5
4.2 West Yorkshire Low Emissions Strategy (WYLES) .....	6
<b>5 Methodology</b> .....	<b>7</b>
5.1 Data Sources .....	7
5.2 IAQM Construction Dust Assessment.....	9
5.3 Simple Air Quality Assessment .....	9
<b>6 Baseline Air Quality</b> .....	<b>9</b>
6.1 Local Air Quality .....	9
6.2 Air Quality Monitoring.....	9
6.3 Background Concentrations.....	10
<b>7 Construction Dust Impact Assessment</b> .....	<b>11</b>
7.1 Step 1 – Requirement for a Detailed Assessment.....	11
7.2 Step 2 – Assess the Risk of Dust Impacts .....	11
7.3 Step 3 – Site-Specific Mitigation .....	13
7.4 Step 4 – Determine Significant Effects.....	13
<b>8 Effect of Air Quality on the Proposed Development</b> .....	<b>14</b>
<b>9 Impact of the Proposed Development on Existing Air Quality</b> .....	<b>14</b>
<b>10 Mitigation</b> .....	<b>15</b>
<b>11 Summary of Impacts and Conclusion</b> .....	<b>15</b>
<b>APPENDICES</b> .....	<b>17</b>
<b>Glossary of Terms</b> .....	<b>35</b>

# 1 Introduction

- 1.1 Miller Goodall Ltd has been instructed to prepare an air quality assessment to accompany a planning application for a proposed residential development at Whitehall Road West, Birkenshaw. The site lies within the administrative boundary of Kirklees Council (KC).
- 1.2 The report provides a review of the existing air quality in proximity to the proposed development site and assesses the potential impact of the proposed development on local air quality following Local Air Quality Management Technical Guidance<sup>1</sup> and EPUK and IAQM guidance<sup>2</sup>.
- 1.3 The report provides an assessment of the potential air quality impacts associated with the construction and operational phases of the proposed development. The suitability of the site for the intended use is also assessed.
- 1.4 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO<sub>2</sub>) and fine particulates, normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM<sub>10</sub>) and 2.5 micrometres (PM<sub>2.5</sub>) since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and congested areas. This assessment has therefore focused on the impact of the proposed development on concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>.

# 2 Site Description

- 2.1 The site is located in Birkenshaw village and currently consists of trees and one dwelling.
- 2.2 Whitehall Road West runs along the northern site boundary, with West Yorkshire Fire & Rescue Service located beyond this road. Residential dwellings are located to the east and south of the proposed development. There is a commercial premises to the west of the proposed development, Status International (UK) Limited. The site location is shown in **Appendix A**.

---

<sup>1</sup> Department for the Environment Food and Rural Affairs (2022). Local Air Quality Management Technical Guidance Document LAQM.TG(22)

<sup>2</sup> EPUK and IAQM (January 2017) Land Use Planning and Development Control: Planning for Air Quality (v1.2)

- 2.3 The site is not located in an Air Quality Management Area (AQMA). The nearest AQMA is 130 m to the east of the proposed development site along the A58. An AQMA is also located 210 m southeast of the proposed development site.

## 3 Proposed Development

- 3.1 The proposed development is for 23 residential dwellings. Each new dwelling will house an electric vehicle (EV) charging point. The existing dwelling will remain.

## 4 Policy Context

### 4.1 Air Quality Objectives

- 4.1.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.
- 4.1.2 The United Kingdom left the European Union on 31<sup>st</sup> January 2020 and is no longer a member state. However, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018<sup>[3]</sup>.
- 4.1.3 The relevant air quality standards and objectives (amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020)<sup>4</sup> are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health.

---

<sup>3</sup> UK Parliament (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

<sup>4</sup> UK Parliament (2020): <https://www.legislation.gov.uk/uksi/2020/1313/made>

**Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management**

Pollutant	Air Quality Objective	
	Concentration	Measured As
Nitrogen dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup>	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m <sup>3</sup>	Annual mean
Particles (PM <sub>10</sub> )	50 µg/m <sup>3</sup>	24-hour mean not to be exceeded more than 35 times per year
	40 µg/m <sup>3</sup>	Annual mean
Particles (PM <sub>2.5</sub> )	20 µg/m <sup>3</sup>	Annual mean (target)
	10 µg/m <sup>3</sup>	Annual mean (target) (to be achieved by 2040)

4.1.4 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as AQMAs and take action to work towards meeting the objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

4.1.5 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

## 4.2 West Yorkshire Low Emissions Strategy (WYLES)

4.2.1 KC is part of the West Yorkshire Low Emissions Strategy Group (WYLES) which has published technical guidance<sup>5</sup> to assist local planning authorities to deliver national air quality objectives. The technical guidance has a process to classify the proposed development as well as determine the type of assessment and mitigation needed for it using the following staged approach as shown in **Table 2**.

<sup>5</sup> West Yorkshire Low Emissions Strategy Group Air Quality & Emissions Technical Planning Guidance.

**Table 2: WYLES site classification assessment**

Step	Proposed Outcome	Justification
Stage 1 – Development Type Classification	Minor	The proposed development meets the criteria to be classified as minor because it consists of less than 50 dwellings, will not generate 30 or more two-way vehicle movements in any hour, will not generate 100 or more two-way vehicle movements per day, is not proposing 100 or more parking spaces, the local transport infrastructure in the area is adequate and it is not located within or directly adjacent to an AQMA.
Stage 2 – Air Quality Impact Assessment	Required	The proposed development is for residential dwellings. Therefore, the effect of air quality on the proposed development will be assessed.
Stage 3 – Mitigation	Type 1	<ul style="list-style-type: none"> <li>• Construction dust mitigation measures.</li> <li>• One charging point is required for each dwelling with allocated parking.</li> </ul>

4.2.2 A simple air quality assessment has been prepared to determine the suitability of the site as well as the impact of the construction and operational phases of the development on existing receptors and the mitigation required to comply with the WYLES technical guidance<sup>5</sup>.

## 5 Methodology

### 5.1 Data Sources

5.1.1 The air quality assessment has been undertaken and prepared with reference to information from several sources, as detailed in **Table 3**.

**Table 3: Key Information Sources**

Data Source	Reference
Kirklees Council (KC)	KC (2023) <i>2023 Air Quality Annual Status Report</i>
West Yorkshire Low Emissions Strategy Group	Air Quality & Emissions Technical Planning Guidance (Part of West Yorkshire Low Emissions Strategy)
Institute of Air Quality Management (IAQM)	IAQM "Guidance on the assessment of dust from demolition and construction" v2.2 2024
Department for Environment Food and Rural Affairs (Defra)	Defra <i>Local Air Quality Management Technical Guidance TG(22)</i> , updated 2022
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) <i>Land Use Planning and Development Control: Planning for Air Quality (v1.2)</i>
Ministry of Housing, Communities & Local Government	Planning Practice Guidance: Air Quality, November 2019  National Planning Policy Framework (NPPF), December 2023
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps
Development Planning Limited	Traffic Data

## 5.2 IAQM Construction Dust Assessment

5.2.1 The IAQM has produced guidance<sup>6</sup> on the assessment of air quality impacts arising from dust associated with construction and demolition activities and provides a methodology by which to complete such assessments. The IAQM methodology provides a risk assessment structure to determine the likely impact of the development on nearby receptor locations and recommends mitigation measures that should be implemented to reduce any such impact. The methodology for the assessment is shown in **Appendix B**. The study area in relation to dust and the zones of interest used within the assessment (<20 m, 20 m – 50 m and 50 – 100 m from the site) are shown in **Appendix C**. The dust assessment informed the recommended mitigation outlined in **Appendix D**.

## 5.3 Simple Air Quality Assessment

5.3.1 A simple assessment of air quality in terms of the impact of the development and suitability of the site, which relies on already published information, has been completed using sources such as the Local Authority's monitoring network and the Defra LAQM support tools. The assessment complies with the WYLES technical guidance<sup>5</sup>.

# 6 Baseline Air Quality

## 6.1 Local Air Quality

6.1.1 Baseline air quality at the proposed development has been established by examining monitoring data produced by KC (provided in the 2023 Annual Status Report) and background concentration maps provided by Defra for the grid squares covering the proposed development.

6.1.2 The site is not located in an AQMA. The nearest AQMA is 130 m to the east of the proposed development site along the A58. An AQMA is also located 210 m southeast of the proposed development site.

## 6.2 Air Quality Monitoring

### *Nitrogen Dioxide (NO<sub>2</sub>)*

6.2.1 KC monitors NO<sub>2</sub> in Birkenshaw via several diffusion tubes. Diffusion tube K38 is adjacent to the proposed development site. The results from the diffusion tube are shown in **Table 4** and the monitor location is shown in **Appendix A**.

**Table 4: Annual Mean NO<sub>2</sub> Concentrations Monitored by KC within the Study Area**

Site ID (Classification)	Location	Annual Mean NO <sub>2</sub> Concentrations (µg/m <sup>3</sup> )				
		2018	2019	2020	2021	2022
K38 (Roadside)	420222 427764	37.8	37.1	27.3	33.3	36.6
Annual Mean NO <sub>2</sub> air quality objective					40 µg/m <sup>3</sup>	

6.2.2 The monitoring results in **Table 4** indicate that annual mean concentrations of NO<sub>2</sub> were below the NO<sub>2</sub> annual mean objective at K38 during the period shown.

6.2.3 The results indicate that the short-term objective for NO<sub>2</sub> was unlikely to be exceeded at K38 as monitored annual mean concentrations were well below the indicative screening concentration of 60 µg/m<sup>3</sup> during the period shown.

#### *Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>)*

6.2.4 KC does not undertake PM<sub>10</sub> or PM<sub>2.5</sub> monitoring in Birkenshaw.

## 6.3 Background Concentrations

6.3.1 Background concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> obtained from the background concentration maps provided by Defra for the grid squares covering the proposed development and receptor locations<sup>7</sup> are shown in **Table 5**.

**Table 5: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site\***

Grid Square	Pollutant	2025 (opening year)
		(µg/m <sup>3</sup> )
420500, 427500	NO <sub>2</sub>	16.55
	PM <sub>10</sub>	13.25
	PM <sub>2.5</sub>	8.69

\* Background concentrations obtained from the latest 2018 based background maps

<sup>7</sup> <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

## 7 Construction Dust Impact Assessment

### 7.1 Step 1 – Requirement for a Detailed Assessment

7.1.1 There are sensitive receptors located within 250m of the site boundary, therefore, a detailed assessment of the construction phase of the development has been undertaken. There are no ecological designations within 50m of the site boundary or 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s) which require assessment.

### 7.2 Step 2 – Assess the Risk of Dust Impacts

#### *Step 2A Dust Emission Magnitude*

7.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table B1** in **Appendix B**. The scale and nature of works onsite were considered to determine the potential dust emission magnitude for earthwork activities, construction and trackout activities. No demolition is required at the development site.

7.2.2 Information to determine the classification has been estimated from the site plans, Google Earth and information provided by the Applicant. The dust emission magnitude is outlined in **Table 6**.

**Table 6: Dust Emission Magnitudes for Each Activity**

Activity	Dust Emission Magnitudes	Justification for Sensitivity Classification
Earthworks	Small	<ul style="list-style-type: none"> <li>the site area is less than 18,000 m<sup>2</sup>.</li> </ul>
Construction	Medium	<ul style="list-style-type: none"> <li>total building volume estimated to be constructed is between 12,000 to 75,000 m<sup>3</sup>.</li> </ul>
Trackout	Small	<ul style="list-style-type: none"> <li>there are likely to be less than 20 HDV outward movements in any one day.</li> </ul>

#### *Step 2B Sensitivity of the Receptors to Dust Soiling and Health Effects*

7.2.3 Dwellings are located within a distance of 20 m from earthworks and construction, and 20 m of road edges used by traffic associated with the site construction. In accordance with the criteria in **Table B2** in **Appendix B** and the IAQM guidance, the sensitivity of human receptors is **high**.

*Step 2B Sensitivity of the Area to Dust Soiling and Human Health Effects of PM<sub>10</sub>*

- 7.2.4 The sensitivity of the area for dust soiling and human health effects has been determined using the criteria detailed in **Table B3 and Table B4** respectively in **Appendix B**.
- 7.2.5 The sensitivity of the area to dust soiling and human health for each activity is summarised in **Table 7**.

**Table 7: Outcome of Defining the Sensitivity of the Area**

Pollution	Activity	Sensitivity of the Surrounding Area	Justification for Sensitivity Classification
Dust Soiling	Earthworks	High	There are 10 – 100 highly sensitive receptors within 20 m of the site boundary.
	Construction	High	There are 10 – 100 highly sensitive receptors within 20 m of construction activity.
	Trackout	High	There are 10 – 100 highly sensitive receptors within 20 m of the trackout route, up to 50 m of the site exit.
Human Health	Earthworks	Low	There are 10 – 100 highly sensitive receptors within 20 m of the site boundary. Background PM <sub>10</sub> pollutant concentrations are below 24 µg/m <sup>3</sup> .
	Construction	Low	There are 10 – 100 highly sensitive receptors within 20 m of construction activity. Background PM <sub>10</sub> pollutant concentrations are below 24 µg/m <sup>3</sup> .
	Trackout	Low	There are 10 – 100 highly sensitive receptors within 20 m of the trackout route, up to 50 m of the site exit. Background PM <sub>10</sub> pollutant concentrations are below 24 µg/m <sup>3</sup> .

*Step 2C Risk of Impacts*

- 7.2.6 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts have been determined using the criteria detailed in **Table B5 to Table B8** in **Appendix B**.
- 7.2.7 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 8**.

**Table 8: Risk of Dust Impacts**

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

### 7.3 Step 3 – Site-Specific Mitigation

7.3.1 Step 3 of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Mitigation measures specific to construction and trackout are proposed based on the risk classifications in **Table 8**. There are no specific mitigation measures for earthworks because the risk is low. Recommended mitigation measures are shown in **Appendix D**.

7.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'medium risk' classification (in this instance the site is classified as "medium" risk due to construction)<sup>8</sup>.

### 7.4 Step 4 – Determine Significant Effects

7.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the mitigation measures, therefore, the residual impacts from the construction are considered to be not significant when considered following IAQM guidance.

<sup>8</sup> For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for demolition and track-out, the general measures applicable to a high risk site should be applied.

## 8 Effect of Air Quality on the Proposed Development

- 8.1 The background concentrations in **Table 5** show that background concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are well below health-based air quality objectives of 40 µg/m<sup>3</sup> for both pollutants. However, the site is likely experiencing higher concentrations due to its proximity to the road network.
- 8.2 The proposed development site is not located within an AQMA. The proposed development site is located adjacent to a roadside NO<sub>2</sub> diffusion tube, K38. Since 2018, the NO<sub>2</sub> annual mean concentrations at K38 have been below the annual mean objective. The proposed dwellings are set further back from the roadside than K38. The concentration of primary pollutants, such as NO<sub>2</sub>, decreases as the distance from the source increases. Therefore, K38 is likely to be exposed to higher concentrations of roadside air pollutants, such as NO<sub>2</sub>, compared to the proposed dwellings.
- 8.3 The evidence from existing information sources is that the proposed development site is likely to experience levels of NO<sub>2</sub> and PM<sub>10</sub> below the annual mean and short-term objectives for the pollutants and below the annual mean target for PM<sub>2.5</sub>.

## 9 Impact of the Proposed Development on Existing Air Quality

- 9.1 The proposed development will introduce a net increase of 99.6 light-duty vehicles (LDV) Annual Average Daily Traffic (AADT) and zero heavy-duty vehicles (HDV).
- 9.2 The transport consultant has confirmed that the development traffic will split 50:50 to the east and west of the development site.
- 9.3 The total development flows are below 500 LDV AADT and 100 HDV AADT outside an AQMA and will be below 100 LDV AADT and 25 HDV AADT within any of the nearby AQMAs. Therefore, in accordance with IAQM guidance<sup>2</sup>, the potential for air quality changes arising from development traffic to cause adverse effects can be concluded as not significant.
- 9.4 The dwellings will be heated via gas-fired boilers, all gas-fired boilers installed will meet a minimum standard of <40 mgNO<sub>x</sub>/kWh, in accordance with the IAQM guidance<sup>2</sup>.

## 10 Mitigation

- 10.1 Whilst this site will not have a significant impact on local air quality, the WYLES technical guidance<sup>5</sup> requires "Type 1" mitigation measures for a Minor development classification.
- 10.2 Type 1 mitigation measures require:
- Control of Construction Emissions. In this case, mitigation of construction dust will be achieved by the use of the mitigation measures outlined in **Appendix D**. The guidance does state "*Adherence to the London Best Practice Guidance for all demolition and construction works.*" However, the IAQM (2024) demolition and construction dust guidance<sup>6</sup> has been used because this is the most up-to-date guidance, whereas the London guidance was published in 2014.
  - One EV charging point is required for each dwelling with allocated parking. The proposed development has an EV charging point for each proposed dwelling.
- 10.3 Consequently, the proposed development meets and provides all of the type 1 mitigation measure requirements.

## 11 Summary of Impacts and Conclusion

- 11.1 This air quality report assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.
- 11.2 The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.
- 11.3 Concentrations of NO<sub>2</sub> and PM<sub>10</sub> are likely to be below their respective long and short-term objectives at the proposed development site which is therefore considered suitable for residential use with regards to air quality. Concentrations of PM<sub>2.5</sub> are expected to be below the annual mean target.
- 11.4 The proposed development is not expected to have a significant effect on local air quality. The assessment has been prepared in accordance with the West Yorkshire Low Emissions Strategy Group Air Quality & Emissions Technical Planning Guidance and provides the specified mitigation.
- 11.5 There is, therefore, no reason for this application to be refused on the grounds of air quality.

This page is left blank intentionally

## **APPENDICES**

This page is left blank intentionally

## Appendix A: Location of site and KC monitoring



This page is left blank intentionally

---

## Appendix B: IAQM Dust Risk Assessment Methodology

The following section outlines criteria developed by the IAQM for the assessment of air quality impacts arising from construction and demolition activities<sup>6</sup>. The assessment procedure is divided into four steps and is summarised below:

### *Step 1: Screen the Need for a Detailed Assessment*

An assessment will normally be required where there are human receptors within 250 m of the site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s). Ecological receptors within 50 m of the site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s), are also identified at this stage. An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects will not be significant.

### *Step 2: Assess the Risk of Dust Impacts*

In step two, a site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the IAQM (construction, demolition, earthworks and trackout). A site can be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

#### *Step 2A: Define the Potential Dust Emission Magnitude*

Dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium or Large. The IAQM guidance recommends that the dust emission magnitude is determined separately for demolition, earthworks, construction and trackout. **Table B1** describes the potential dust emission class criteria for each outlined activity.

**Table B1: Criteria Used in the Determination of Dust Emission Magnitude**

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <12,000 m <sup>3</sup> , construction materials with low potential for dust release.	Total building volume 12,000 m <sup>3</sup> – 75,000 m <sup>3</sup> , potential dusty construction material.	Total building volume >75,000 m <sup>3</sup> , potentially dusty construction material.
Earthworks	Total site area <18,000 m <sup>2</sup> , soil type with large grain	Total site area 18,000 – 110,000 m <sup>2</sup> , moderately dusty soil type	Total site area >110,000 m <sup>2</sup> , potentially dusty soil type
Construction	Total building volume <12,000 m <sup>3</sup> .	Total building volume 12,000 – 75,000 m <sup>3</sup> .	Total building volume >75,000 m <sup>3</sup> .
Trackout	<20 outward HDV trips in any one day. Unpaved road length <50 m.	20–50 outward HDV trips in any one day. Unpaved road length 50–100 m.	>50 outward HDV trips in any one day. Unpaved road length >100 m.

### Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM<sub>10</sub> concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

The criteria detailed in **Table B2** is used to determine the sensitivity of the receptor in relation to dust soiling, health effects and ecological effects.

**Table B2: Criteria for Determining Sensitivity of Receptors**

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM <sub>10</sub>	Ecological Sites
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes	International or national designation <i>and</i> the features may be affected by dust soiling; or 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
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM <sub>10</sub>	Presence of an important plant species where dust sensitivity is uncertain or locations with a national designation with features that may be affected by dust deposition
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Local designation where features may be affected by dust deposition

**Table B3** and **Table B4** are then used to define the sensitivity of the area to dust soiling and human health effects. **Table B5** is used to define the sensitivity of the area to ecological impacts. This should be derived for each of construction, demolition, earthworks and trackout.

**Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property.**

Receptor Sensitivity	Number of Receptors	Distance from Source (m)*			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

\*distances considered are to the dust source

**Table B4: Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentrations	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m <sup>3</sup>	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m <sup>3</sup>	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m <sup>3</sup>	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m <sup>3</sup>	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m <sup>3</sup>	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m <sup>3</sup>	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m <sup>3</sup>	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
<24 µg/m <sup>3</sup>	>10	Low	Low	Low	Low	
	1-10	Low	Low	Low	Low	
Low	-	>1	Low	Low	Low	Low

**Table B5: Sensitivity of the Area to Ecological Impacts<sup>a, b, c</sup>**

Receptor Sensitivity	Distance from Source (m) <sup>c</sup>	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

<sup>a</sup> The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout and for each designated site. See STEP 2B, Box 8 and Box 9 of IAQM guidance.

<sup>b</sup> Only the highest level of area sensitivity from the table needs to be considered.

<sup>c</sup> For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site.

The sensitivity of the area is then summarised.

### Step 2C Define the Risks of Impacts

The dust emission magnitude from **Table B1** and sensitivity of the area and receptors from **Table B2**, **Table B3**, **Table B4** and **Table B5** are combined, and the risk of impacts from each activity (demolition, earthworks, construction and trackout) before mitigation is applied, is determined using the criteria detailed in **Table B6** to **Table B9**.

**Table B6: Risk of Dust Impacts - Demolition**

Potential Impact Sensitivity of the 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 B7: Risk of Dust Impacts- Earthworks**

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

**Table B8: Risk of Dust Impacts- Construction**

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

**Table B9: Risk of Dust Impacts- Trackout**

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

### *Step 3 Determine Site Specific Mitigation*

Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

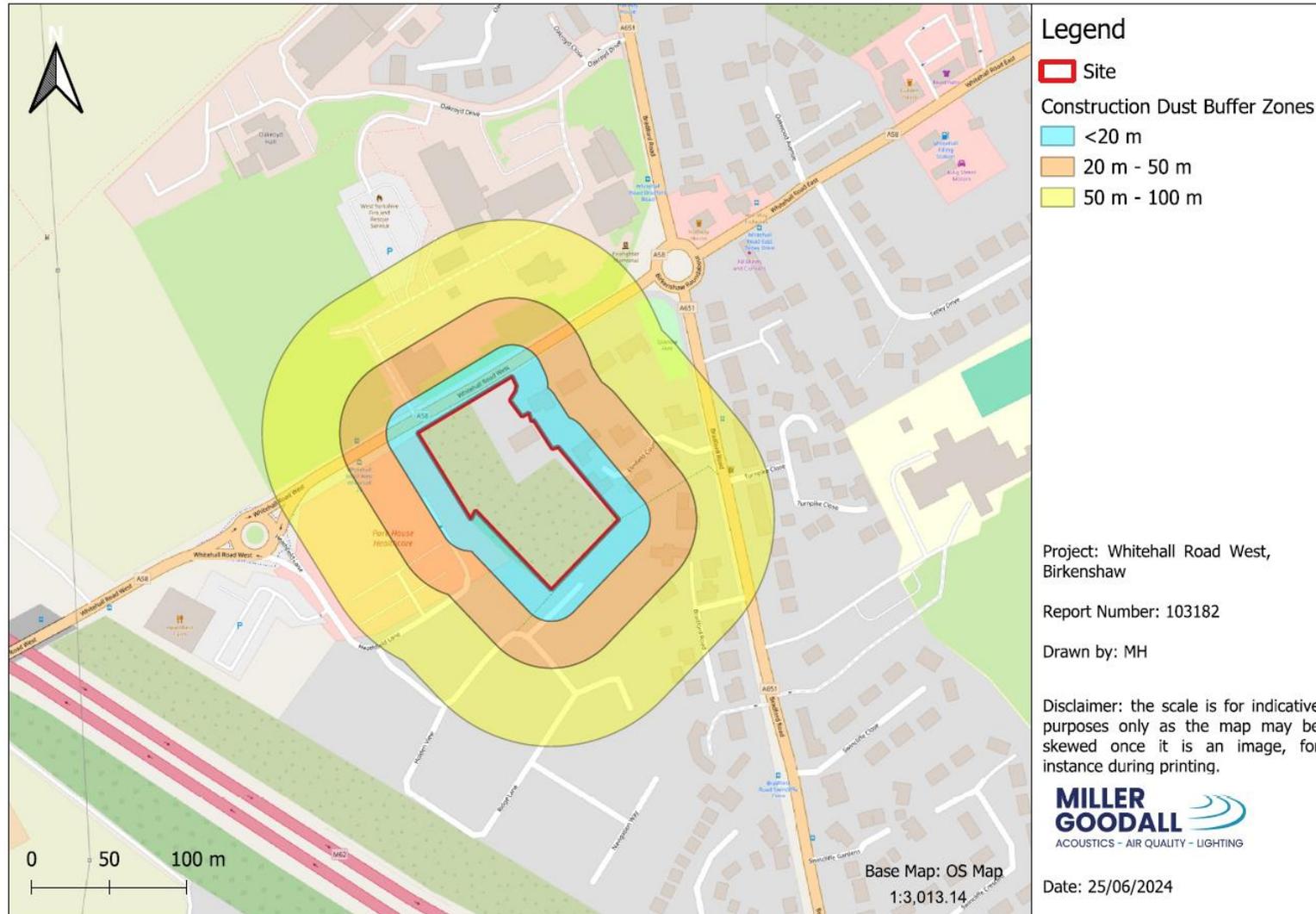
### *Step 4 Determine Significance of Residual Effects*

At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

This page is left blank intentionally

## Appendix C: Construction Dust Buffer Zones



This page is left blank intentionally

## Appendix D: IAQM Dust Assessment Mitigation

**xx Highly Recommended**

**x Desirable**

### Measures relevant for earthworks, construction and trackout

Mitigation Measure	Medium Risk
<b>Communications</b>	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	xx
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.	xx
Display the head or regional office contact information.	xx
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, realtime PM <sub>10</sub> continuous monitoring and/or visual inspections.	xx
<b>Site management</b>	
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.	xx
Make the complaints log available to the local authority when asked.	xx
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	xx
<b>Monitoring</b>	
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	x
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	xx
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.	xx

Mitigation Measure	Medium Risk
Agree dust deposition, dust flux, or real-time PM <sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	XX
<b>Preparing and maintaining the site</b>	
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	XX
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	XX
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	XX
Avoid site runoff of water or mud.	XX
Keep site fencing, barriers and scaffolding clean using wet methods.	XX
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	XX
Cover, seed or fence stockpiles to prevent wind whipping.	XX
<b>Operating vehicle/machinery and sustainable travel</b>	
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	XX
Ensure all vehicles switch off engines when stationary - no idling vehicles.	XX
Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	XX
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	X
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	X
<b>Operations</b>	
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.	XX
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	XX
Use enclosed chutes and conveyors and covered skips.	XX

Mitigation Measure	Medium Risk
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	XX
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.	XX
<b>Waste management</b>	
Avoid bonfires and burning of waste materials.	XX

### Measures specific to construction

Mitigation Measure	Medium Risk
Avoid scabbling (roughening of concrete surfaces) if possible.	X
Ensure sand and other aggregates are stored in banded 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.	XX
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	X
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	X

**Measures specific to trackout**

Mitigation Measure	Low Risk
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	x
Avoid dry sweeping of large areas.	x
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	x
Record all inspections of haul routes and any subsequent action in a site log book.	x
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	x

---

## Glossary of Terms

**AADT** Annual Average Daily Traffic flow

**Air Quality Standard** Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

**Air Quality Objective** Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

**Annual Mean** A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

- (a) in the case of lead, the mean of the daily levels for that year;
- (b) in the case of nitrogen dioxide, the mean of the hourly means for that year;
- (c) in the case of PM<sub>10</sub>, the mean of the 24-hour means for that year.

**Annoyance (Dust)** Loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance.

**AQAP** Air Quality Action Plan

**AQMA** Air Quality Management Area

**AQMP** Air Quality Management Plan

**AQO** Air Quality Objective

**AQS** Air Quality Strategy for England, Scotland, Wales and Northern Ireland

**Background Concentrations** The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

**Construction** Any activity involved with the provision of a new structure (or structures), its modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc.

**Construction Impact Assessment** An assessment of the impacts of demolition, earthworks, construction and trackout. In this Guidance, specifically the air quality impacts.

**Defra** Department for Environment, Food and Rural Affairs

**Demolition** Any activity involved with the removal of an existing structure (or structures). This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time.

**Deposited Dust** that is no longer in the air and which has settled onto a surface. Deposited dust is also sometimes called amenity dust or nuisance dust, with the term nuisance applied in the general sense rather than the specific legal definition.

**DMP** Dust Management Plan; a document that describes the site-specific methods to be used to control dust emissions.

**Dust** Solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. The terms dust and particulate matter (PM) are often used interchangeably, although in some contexts one term tends to be used in preference to the other. In this guidance the term 'dust' has been used to include the particles that give rise to soiling, and to other human health and ecological effects. Note: this is different to the definition given in BS 6069, where dust refers to particles up to 75 µm in diameter.

**Earthworks** Covers the processes of soil-stripping, ground-leveling, excavation and landscaping.

**Effects** The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or mortality due to exposure to PM<sub>10</sub> or PM<sub>2.5</sub> or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

**EPUK** Environmental Protection UK

**HDV** Heavy Duty Vehicle

**Impacts** The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

**LAQM** Local Air Quality Management

**LDV** Light Duty Vehicle

**Mg/m<sup>3</sup>** Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m<sup>3</sup> means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

**NO<sub>2</sub>** Nitrogen Dioxide

**NO<sub>x</sub>** A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>)

**NPPF** National Planning Policy Framework

**Nuisance** The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and use of his land.

Public nuisance, arising from an act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

**PM<sub>2.5</sub>** The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM<sub>2.5</sub>, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

**PM<sub>10</sub>** The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM<sub>10</sub>, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

**Running Annual Mean** A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

**Trackout** The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

